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State of New Jersey
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NJ Department of Environmental Protection
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2008 New Jersey Integrated Water Quality Monitoring and Assessment Report

Executive Summary

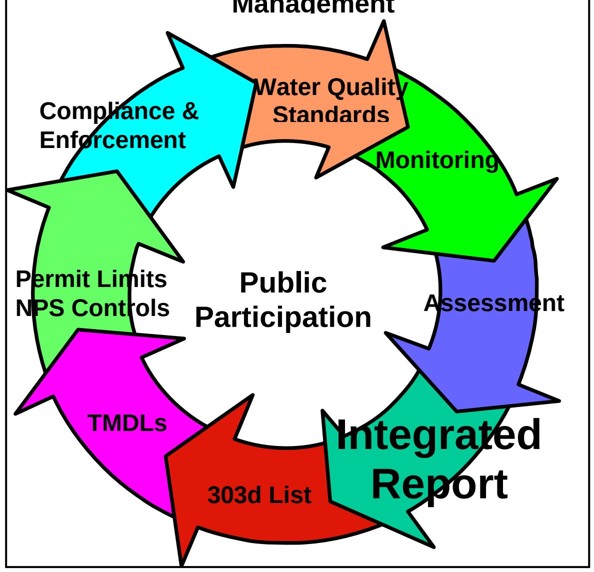
The 2008 New Jersey Integrated Water Quality Monitoring and Assessment Report (Integrated Report) provides extensive information about the water quality conditions and trends of New Jersey's water resources to inform the general public and guide water resource management at statewide, regional, and local levels. This information includes a detailed description of the types and relative amount of water resources in the State of New Jersey, the different types of water monitoring and assessment programs (surface and ground water), and the various management strategies and actions being employed by the New Jersey Department of Environmental Protection (Department) to protect and improve water quality.

In accordance with federal guidelines, the main focus of the 2008 Integrated Report is on the assessment of the State's surface waters - rivers, streams, lakes, ponds, reservoirs, estuaries, and ocean waters. Ambient water quality data is evaluated to determine compliance with the surface water classifications and water quality criteria and the attainment of the designated uses: aquatic life; recreation; drinking, industrial, and agricultural water supply; fish consumption; and shellfish harvest for consumption established in New Jersey's Surface Water Quality Standards (N.J.A.C. 7:9B). The Integrated Report summarizes the methods used to assess compliance with the surface water quality standards and attainment of designated uses, the results of the statewide water quality assessment as well as water quality trends, and the identification of waters that require development of total maximum daily loads (TMDLs) to achieve surface water quality standards and attain the designated uses. The Integrated Report also provides information on the condition of New Jersey's ground waters and wetlands.

Goal of the Integrated Report

The goal of the Integrated Report is to provide information about the quality of New Jersey's waters that will inform water resource managers and the public on the status of designated use attainment as well as the actions needed to achieve attainment of all designated uses in all waters of the State. As illustrated in Figure ES-1, the Integrated Report is a key part of the process for managing and protecting the State's water resources. This process, as described in the federal Clean Water Act, includes standards development (Chapter 5); monitoring (Chapter 2); assessment (Chapters 3 and 4); identification and implementation of management strategies (including TMDLs, point and nonpoint source controls, and other water quality programs

Figure ES-1: Water Resource Management



described in Chapter 5), and compliance and enforcement (Chapter 5). The public is afforded the opportunity to participate in each step of the process.

The 2008 Integrated Report provides the following information to inform and guide water resource managers at the statewide, regional, and local levels:

- Surface water classifications and water quality criteria established in the New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B) to protect the designated uses: aquatic life; recreation; drinking, industrial, and agricultural water supply; fish consumption, and shellfish harvest for consumption;

- Organizations providing data to the Department pursuant to the Data Solicitation Notice issued January 20, 2007;

- Methods used to assess attainment of the designated uses;

- Water quality assessment results are based primarily on surface water quality monitoring conducted between January 1, 2002 and December 31, 2006;

- Identification of high quality waters that support all designated uses;

- Identification of waters that do not meet one or more designated uses, the pollutant(s) causing the problem, and priority ranking for TMDL development;

- Status and trends regarding water quality conditions and use attainment of all waters of the State; and

- Management strategies and actions taken to protect and improve water quality, such as the adoption of TMDLs to achieve water quality standards and attain designated uses.

On August 18, 2008, the Department published the draft Integrated Report (including the 303(d) List and 305(b) report sections), for public review and comment. The Department evaluated the comments and made changes to the final 2008 Integrated Report, as appropriate. The information provided in the Integrated Report is used by Congress, USEPA, and the State of New Jersey to establish program priorities and resource allocations for federal and state water resource management programs for protecting, maintaining, and restoring water quality.

Overview of New Jersey's Water Resources

New Jersey is the fifth smallest state in the Nation and is one of the most geologically and hydrologically diverse. New Jersey contains a wide variety of land use types, water resources, geologic characteristics, and natural biota. Within the State's 8,204 square miles are 127 linear miles of coastline, 18,126 miles of rivers and streams[1], and 52,804 acres of named lakes, ponds,

[1] Based on high resolution scale of 1:24,000 (a GIS coverage of New Jersey hydrography at this scale is available from the Department's Web site at http://www.nj.gov/dep/gis/stateshp.html#STATERIV). Although a more detailed

and reservoirs. In addition, there are 260 square miles of estuaries, 739,160 acres of freshwater wetlands, and 209,269 acres of tidal wetlands.

Highlights and Key Findings

Monitoring and Assessment Status

- Water quality and use attainment were assessed on a **subwatershed** scale using U.S. Geological Survey Hydrologic Unit Code (HUC) 14 subwatershed boundaries (950 units) and Delaware River zones (20 units), which comprise New Jersey's 970 **assessment units**. The Executive Summary uses the term "subwatershed" to refer to all 970 assessment units in New Jersey, while the Integrated Report uses "assessment unit".

- The Department assesses the attainment of the designated uses (aquatic life, recreation, water supply, fish and shellfish consumption) using a suite of indicators appropriate to each designated use. Some designated uses apply to all subwatersheds (e.g., recreation); others apply to only some subwatersheds (e.g., shellfish harvest for consumption). Therefore, in determining the percentage of uses assessed and uses attained, the total number of applicable subwatersheds will vary (see Chapter 4 for more details).

- The 2008 Integrated List of Waters was generated from **3,617 individual use assessments** (out of 5,495 possible designated use/subwatershed combinations) and the evaluation of another 1,878 combinations that were determined to have insufficient monitoring information to assess the uses.

- The 2008 Integrated Report was developed based on **water quality data from over 5,000 sampling stations** monitored by the Department, federal and other state/interstate government agencies, county government agencies, municipal utilities authorities, and non-profit organizations. Seventy percent of this data was generated by the Department's monitoring networks (see Section 3.2 for more details).

- The Department made significant improvements to its methods for assessing use attainment for the 2008 Integrated Report, including refinement of some of the surface water quality criteria used to assess water quality (e.g., pH, temperature) and the development of several new regional indices to assess biological impairment (see Chapter 4 and Appendix F for more details).

- **Assessment of all uses (not including fish consumption) increased to 49% of the State's subwatersheds in 2008,** compared to only 25% in 2006. Only 18% of all subwatersheds were fully assessed for all uses, including fish consumption.

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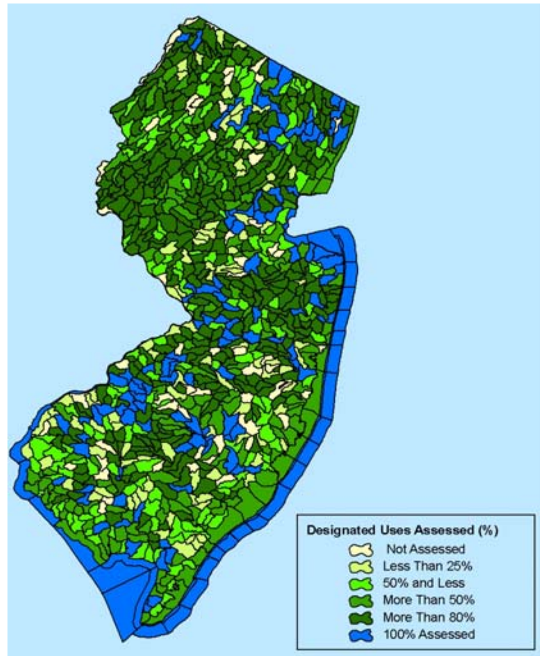
resolution of 1:2,400 is available, the 1:24,000 scale is used for the Integrated Report to maintain consistency between reporting cycles, allowing for direct comparison of use assessments and trend analysis over time.

- **Ninety-four percent (94%) of all subwatersheds were assessed for at least one designated use (see Figure ES-2).**

- **Only 6% of New Jersey's 970 subwatersheds were not assessed for any designated use, compared to 10% in 2006 (see Figure ES-2).**

Figure ES-2: Percentage of Designated Uses Assessed per Subwatershed

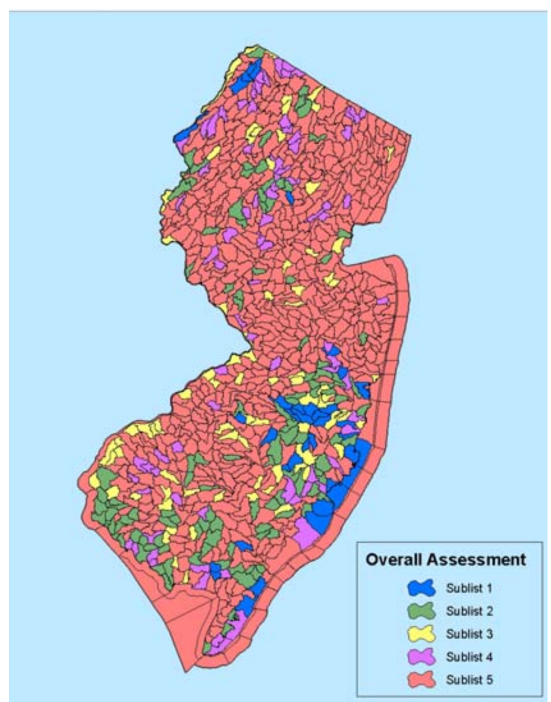


Use Assessment Results

- **The number of subwatersheds that attained all designated uses (Sublist 1) increased compared to 2006.** Designated uses were fully attained[2] in 37 out of 480 fully assessed subwatersheds. These subwatersheds were assigned to Sublist 1 of the 2008 Integrated List of Waters (see Figure ES-3). In 2006, only 24 out of 241 fully assessed subwatersheds attained all designated uses and were assigned to Sublist 1. The increase in subwatersheds assigned to Sublist 1 is directly related to the increase in subwatersheds assessed, which is consistent with the Department's expectation that as the amount of information collected and assessed increases through expanded monitoring, so will the number of subwatersheds found to be attaining all designated uses.

- **A total of 487 subwatershed/pollutant combinations were delisted from the 2006 303(d) List of Water Quality Limited Waters** for various reasons including water quality improvement/restoration, TMDL development, and revisions to surface water quality standards**.**

Figure ES-3: 2008 Integrated List Results



<u>Aquatic Life Uses (General and Trout)</u>

- **Twenty-four percent (24%) of all 970 subwatersheds attained the general aquatic life use** (a 4% increase over 2006), 64% did not attain the use, and 12% were not assessed. Subwatersheds attaining the aquatic life use were concentrated in the least developed areas of the State – the upper

[2] "Fully attained" means all applicable designated uses except fish consumption were assessed and attained, in accordance with USEPA guidelines.

northwest corner, the Pinelands Region, and adjacent estuarine waters (see Section 4.2 for more details).

- There are 196 subwatersheds designated for the Trout Aquatic Life Use (i.e., Trout Production or Trout Maintenance Waters). **Twenty-one percent (21%) of these subwatersheds attained the trout aquatic life designated use**, 63% did not attain the use, and 16% were not assessed, a slight increase in both use attainment and non-attainment over 2006 due to increased availability of monitoring data, as well as assessment using the new temperature criteria (see Section 4.2 for more details).

- **The State's ocean waters did not attain aquatic life uses based on dissolved oxygen (DO) levels.** Low DO in the ocean is due to an extensive anoxic cell that forms off the coast during the summer months and breaks up in the fall. DO is not an adequate measure of the health of the aquatic community; however, it is being used as an indicator of aquatic life use attainment in ocean waters while the Department develops additional measures, including biological indicators. A biological indicator is expected to be available for the first time to re-evaluate aquatic life use in New Jersey ocean waters in 2010 (see Sections 4.2 and 4.8 for more details).

Fish and Shellfish Consumption

- **None of the subwatersheds assessed for fish consumption (based on fish consumption advisories) attained the use.** Therefore, while the number of subwatersheds assessed in 2008 increased, so did the number of subwatersheds assigned to Sublist 5. It is expected that wherever waters are assessed for fish consumption, the use will not be attained because health advisories will continue to be issued limiting consumption of fish contaminated by mercury and PCBs (see Sections 4.6 for more details).

- There are 169 subwatersheds with waters designated for shellfish harvest for consumption. These shellfish waters total 674,000 acres classified as either "Approved", "Harvestable: Special Restricted", "Harvestable: Seasonal", or "Prohibited Harvest", pursuant to the Shellfish Growing Waters rules at N.J.A.C. 7:12. Shellfish waters classified as "Approved" have no restrictions on shellfish harvesting. All shellfish waters within a subwatershed must have the "Approved" classification for the shellfish use to be assessed as attained. Subwatersheds containing shellfish waters with any type of restriction (i.e., classified as other than "Approved") are assessed as not attaining the shellfish harvest use, until water quality improves enough to support unrestricted harvest. **One hundred and ten shellfish subwatersheds were assessed as attaining the shellfish harvest for consumption use. Since 2002, shellfish waters approved for unrestricted harvest increased by 7,000 acres,** indicating an improving trend in water quality in New Jersey's estuaries. TMDLs have been developed for 75% of subwatersheds listed as not attaining the shellfish harvest for consumption use. (See Section 4.7 for more details).

Recreation

- All of the State's ocean beaches from Sandy Hook to Cape May Point are fully swimmable, i.e., they attain the primary contact recreational use (see Figure 4.3-2), with the exception of a 250-yard span across four beaches at the Spring Lake/Sea Girt border in Monmouth County, Brown Avenue, York Avenue, Beacon, and Terrace beaches. This span of ocean beaches is particularly affected by the impact of excessive rainfall on discharge from Wreck Pond. Since 2002, a precautionary beach closing plan has been implemented requiring that the bathing areas of these beaches north and south of the Wreck Pond outfall are automatically closed for 24 hours after the end of all rainfalls greater than 0.1 inch; for 48 hours from the end of all rainfalls greater than 2.8 inches within a 24-hour period; or for any visible discharge from the Wreck Pond ocean outfall.

- All 970 of New Jersey's subwatersheds are designated for some type of recreational use (primary (948) or secondary contact (22)), out of which **19% attained the use, 41% did not attain the use, and 40% were not assessed.** TMDLs have been completed for 80% (321) of the subwatersheds that did not attain recreational uses because of pathogens (fecal coliform/*E. coli*). (See Section 4.3 for more details.)

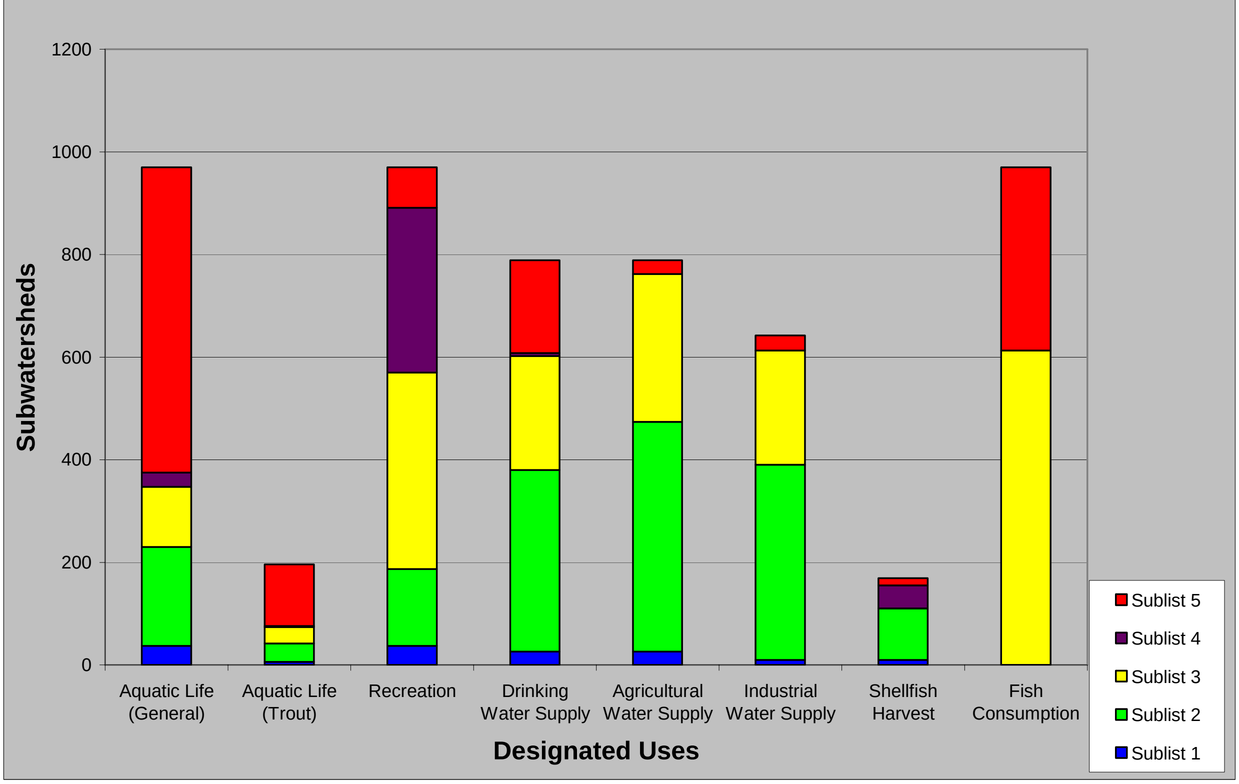
2008 Water Quality Assessment Results

The assessment results for the 2008 Integrated List of Waters are summarized in Figure ES-4. This figure depicts the total number of subwatersheds for which each designated use applies, the number of subwatersheds assessed for each use, and the status of the designated use assessments. Subwatersheds attaining all applicable designated uses are assigned to Sublist 1. Individual subwatershed/designated use combinations are assigned to the remaining sublists as follows: Sublist 2 for the individual uses that were assessed and attained, Sublist 3 for uses that were not assessed, Sublist 4 for uses that were not attained but for which TMDLs were approved, and Sublist 5 for uses that were not attained and that require TMDL development.

The Department identified 745 subwatersheds (77%) that did not attain one or more of the applicable designated uses, compared to 688 subwatersheds (71%) in 2006. It is assumed that the increase in the number of subwatersheds that did not attain at least one designated use is due to the availability of monitoring data and new assessment methods. These subwatershed/designated use combinations are identified as Sublist 5 on the 2008 Integrated List of Waters (Appendix A).

Figure ES-4 shows the assessment results for each designated use based on the number of subwatersheds assigned to each of the five sublists comprising the 2008 Integrated List of Waters. The height of the bars illustrates the relative applicability of each designated use to the State's 970 subwatersheds in New Jersey. While aquatic life (general), recreation, and fish consumption apply to all waters of the State, other uses such as aquatic life trout and water supply apply only in certain waters. Based on the sublist results, the shellfish harvest for consumption was the only fully assessed use. Fish consumption was the least assessed use; however, results indicate that 100% of all the waters assessed for fish consumption are impaired for this use. While a large portion of the subwatersheds designated for recreational uses were not assessed, a majority of the assessed waters that did not attain this use already have established TMDLs. A high percentage of subwatersheds designated for aquatic life uses (general and trout) were assessed; however, a majority of the assessed subwatersheds did not attain these uses. The extent of use non-attainment was greatest for aquatic life uses, which may be due to conventional pollutants such as temperature, toxic pollutants such as copper, or non-chemical causes such as hydromodification, alterations to habitat (scouring, sedimentation, etc.).

Figure ES-4: Use Assessment Results per Sublist



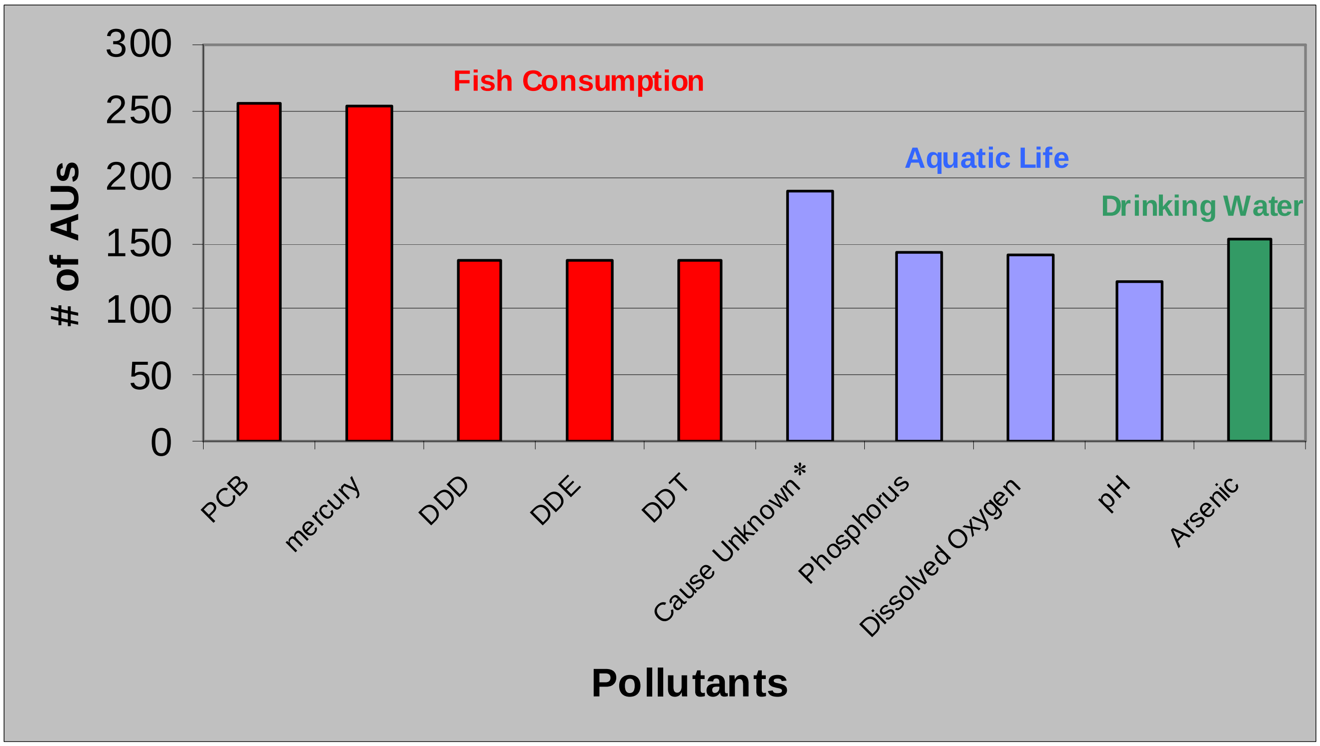
Overall, known water quality and use attainment did not change significantly between the 2006 and 2008. Generally, subwatersheds that do not attain more than one designated use are located in urban/developed areas of the State while subwatersheds that attain all applicable designated uses are located in the Pinelands and other less developed areas of the State. Some differences between the 2006 and 2008 303(d) Lists were due to availability of new data, changes in water quality conditions, or TMDL approval.

Pollutants Causing Use Non-attainment

The pollutant causing non-attainment of the designated use for each of the subwatershed/ designated use combinations assigned to Sublist 5 is identified on the 2008 List of Water Quality Limited Waters (303(d) List). The 2008 303(d) List identified 41 pollutants causing non-attainment of the designated use in one or more subwatersheds, resulting in 2,304 subwatershed/pollutant combinations. The 2006 303(d) List identified 34 pollutants and 2,188 subwatershed/ pollutant combinations. The ten most frequently listed pollutants ("top ten") in

2008 were responsible for 70% of the 303(d) listings, as shown in Figure ES-5. A description of these pollutants is provided below. See Chapter 4 of the Integrated Report for more information on pollutants causing use non-attainment.

Figure ES-5: Top Ten Pollutants on the 2008 303(d) List



*Note: “Cause Unknown” means no pollutant identified.

- **Mercury, PCBs, dioxin, and pesticides resulting in fish consumption advisories comprised approximately 50% of the 2008 303(d) List.** PCB levels in fish are declining, mostly due to the ban on PCB usage in 1978 as a coolant and lubricant in electrical equipment. Reductions in air deposition from in-state and upwind power plants, other industrial sources, and dental facilities in New Jersey are expected to reduce mercury loadings to the State’s waters over time. However, these reductions are not yet sufficient to eliminate the need for fish consumption advisories. Therefore, the number of waters listed as impaired based on fish consumption advisories for these pollutants may increase in the future due to their persistence in the environment and an increase in the available monitoring and assessment.

- Biological monitoring is used to assess aquatic life uses. Where biological monitoring data indicates impairment but chemical water quality data is not available or sampled pollutants do not exceed water quality standards, the Department assesses the aquatic life use as not attained but without identifying a specific pollutant as the cause. In such cases, the waters were listed as **“Pollutant Unknown”** on the 2006 303(d) List (107 listings) and as **“Cause Unknown”** (189 listings) on the 2008 303(d) List. The increase in listings is attributed to the application of new regional biological metrics (the High Gradient Macroinvertebrate Index for Highlands, Ridge and Valley, and Piedmont waters; the Coastal Plain Macroinvertebrate Index for Coastal Plain waters; and the Pinelands Macroinvertebrate Index for Pinelands waters. These new metrics allowed previously unassessed subwatersheds assigned to Sublist 3 to be assessed for aquatic life uses for the first time and assigned to Sublist 5 if impaired, or assigned to Sublist 1 or 2 if not impaired. The application of the new metrics also changed assessment outcomes for previously assessed waters, resulting in some delistings as well as new listings.

- In 2006, 135 subwatersheds were listed for pathogens. For the 2008 Integrated Report, the Department identified the specific bacterial indicator (**fecal coliform/*E. coli*, *Enterococci*, total coliform**) causing non-attainment of the applicable designated uses. As a result, the 2008 303(d) List included 94 total listings for: fecal coliform/*E. coli* (62), *Enterococci* (18), and total coliform (14). The net reduction (135 to 94) in bacterial indicator listings can be attributed to the delisting of individual lakes previously erroneously listed in 2006 using data that did not to meet the Department's data quality requirements and the approval of pathogen TMDLs (see Appendix C: Delisting Document).

- Listings for **pH** decreased significantly from 193 in 2006 to 121 in 2008. This net decrease is generally attributable to the monitoring and reassessment of pH in Coastal Plain waters and the delisting of 103 subwatersheds, 100 of which were found to meet surface water quality standards based on a new method for assessing naturally occurring low pH in Coastal Plain waters, and three that were delisted for meeting the existing applicable surface water quality standards. This monitoring and reassessment resulted in the addition of 31 new pH listings to the 303(d) List.

- **Phosphorus** listings decreased from 184 in 2006 to 143 in 2008. This net decrease is attributable to the delisting of 56 subwatersheds for phosphorus, of which 14 were covered by phosphorus TMDLs approved by USEPA, 39 were found to meet surface water quality standards, and three were corrections to the 2006 303(d) List. However, 29% of all subwatersheds exceeded the numeric criteria for phosphorus in 2008 (1% less than in 2006) and 14 new listings for phosphorus were added to the 303(d) List based on exceedance of the numeric criteria. The Department has developed a Nutrient Criteria Enhancement Plan that describes the Department's strategy for enhancing the existing nutrient criteria for freshwaters and developing nutrient criteria for other (estuarine, marine) waters of the State. The Department is currently developing a new assessment method for freshwaters to better assess nutrient impacts on water quality and use attainment based on compliance with the existing narrative nutrient criteria and policies, rather than relying solely on the numeric phosphorus criteria in freshwaters. Reassessment of the existing phosphorus listings is expected for the 2010 Integrated Report.

- **Arsenic** listings increased from 115 in 2006 to 154 in 2008. This net increase is generally attributable to the availability of data from previously unassessed waters and is not believed to indicate a decline in water quality. Arsenic in water can be naturally-occurring or from manmade sources. Only the Maurice River, which is not used for drinking water, had arsenic concentrations above the Safe Drinking Water Maximum Contaminant Level (MCL).

- The New York/New Jersey Harbor Estuary Program conducted extensive toxics monitoring through the Contamination, Assessment & Reduction Project (CARP). As a result, the Department reassessed all of the **toxics listings for the New Jersey waters in the Harbor** to identify specific substances that exceeded water quality criteria. Based on these findings, the Department has delisted PAHs in all Harbor waters, and added subwatersheds with exceedances for benzo(a)pyrene, chlordane, dieldrin, DDT, DDE, DDD, heptachlor epoxide, hexachlorobenzene, and mercury criteria to the 2008 303(d) List.

- **Un-ionized ammonia** was added to the 2008 303(d) List based on promulgation of a new criterion and new ambient water quality monitoring data submitted by a group of wastewater dischargers in response to the Department's data solicitation notice. This data was collected at sites not previously monitored by the Department; therefore, these 17 new listings for un-ionized ammonia resulted from new data and cannot be compared to previous water quality assessments.

- There was a net increase in **nitrate** listings from six to nine but only two listings reflect a decline in water quality. One new listing resulted from data collected from previously unassessed waters and another new listing was for waters that were inadvertently omitted from the 2006 303(d) List. The other five subwatersheds on the 2008 303(d) List were carried over from 2006 and one subwatershed on the 2006 303(d) List was delisted because it now meets the surface water quality criterion for nitrate.

Water Quality Trends

Physical/chemical Trends

An analysis of water quality trends for the time period 1984 to 2004 was conducted for selected physical and chemical constituents using long-term data from 36 sampling stations located in freshwater nontidal streams throughout the State. The results indicate that nutrient levels and DO conditions are improving or have stabilized throughout the State. These results are consistent with improvements in water quality expected from the upgrades to wastewater treatment plants that have occurred since the 1980's. Nutrient loads, especially ammonia, have been reduced through more extensive wastewater treatment. The overall results suggest that, for constituents removed by the treatment of point sources, water quality has definitely improved; high biological oxidation demands and the resulting depression of DO levels have generally been addressed. However, these DO results are based on traditional daytime sampling. Diurnal DO monitoring data, now becoming more available, indicate that DO concentrations fluctuate and may actually drop below the criterion overnight - an indication that nutrients may be contributing to excessive plant growth.

The trend analysis at these freshwater nontidal stations indicates declining conditions for total dissolved solids (TDS) and an associated measure, specific conductance (SC). The declining TDS and SC trends were found in all types of land uses (urban, agricultural, mixed use, and undeveloped) and physiographic regions. Exceedances of the TDS criterion may be attributed to stormwater runoff from urban and agricultural areas. Discharges from wastewater treatment facilities, including septic systems, can contribute to increased TDS loadings. Road salting and improper salt storage facilities are also major contributors of TDS.

Biological trends

In 1996, the Department established a statewide Ambient Biological Monitoring Network (AMNET) to collect and assess benthic macroinvertebrate populations (insects, worms, mollusks, and other indicator species) in the State's freshwater wadeable streams. In 1996, the results showed that approximately 35% of the waters were not impaired for aquatic life use, approximately 53% were moderately impaired, and approximately 12% were severely impaired, based upon the condition of the benthic macroinvertebrate community. Enhancements in the monitoring network over time, including the assessment categories and scores, make it difficult to directly compare older data with more recent findings. However, between 1997 and 2007, the number of sites exhibiting either "excellent" or "poor" results decreased. This indicates a general shift toward moderate water quality. AMNET data showed a correlation between benthic macroinvertebrate community impairment and different physiographic land types, land uses, and other anthropogenic factors. Specifically, biological impairment was more common in urban streams (urban land is associated with a high percentage of impervious cover) and was directly related to total urban land and total wastewater flow upstream, while streams located within the drainage areas characterized by forests and wetlands were more likely to contain healthy biotic communities. Given the expectations of population growth in New Jersey (an estimated 900,000 more residents by the year 2020), land use changes could contribute to a measurable negative effect on water quality and aquatic communities in the future.

Toxics in Fish

Fish tissue monitoring of bioaccumulative substances is the primary tool for assessing the fish consumption use. Fish tissue samples are analyzed for PCBs, chlorinated pesticides (chlordane, DDX, and others), dioxin and furan compounds, chlorinated organic compounds, and/or PBDE (flame retardant) compounds, depending on the type of fish and waterbody. Excessive levels of these toxic chemicals in fish tissue result in the issuance of fish consumption advisories, in which case the fish consumption use is not attained.

Available fish tissue data from fish collected since the 1990's in New Jersey waters indicate that PCB levels have steadily declined as a result of the 1978 ban on PCBs. Hazardous waste site identification and cleanup, and implementation of proper disposal methods for toxics, should lead to the continued decline of PCBs in fish. Mercury in fish tissue samples collected since the 1990s show no consistent trend. Mercury is still in use and is released to the air from a number of industrial sources including coal-burning power plants, iron and steel manufacturing facilities, medical waste incinerators, and municipal solid waste incinerators. Reductions in air deposition from in-state and upwind power plants, other industrial sources, and dental facilities in New Jersey are expected to reduce mercury loadings to the State's waters over time. Additional data are needed to determine long-term trends in mercury levels in fish; however, reductions of mercury releases from incinerators and other sources, as well as planned reductions in releases from in-state power plants and industrial sources, will reduce mercury loadings from local sources.

If and when more waters are assessed, more of these toxic chemicals will be detected and subwatersheds will be listed as impaired for the fish consumption use and added to the 303(d) List for these pollutants. Since these pollutants persist in the aquatic environment at levels that exceed water quality criteria, and may be discharged by sources not covered by the federal Clean Water Act, a more comprehensive national strategy for source reduction is needed to achieve fish consumption use attainment in New Jersey.

Actions Taken to Restore Water Quality:

The main purpose of the Integrated Report, particularly the 303(d) List, is to identify waters that are not attaining designated uses so they can be prioritized for restorative action and, ultimately, attainment of all designated uses. The Department has taken the following actions to protect, maintain and restore water quality:

- The Department established 157 TMDLs, primarily for phosphorus and pathogens. The Passaic TMDL, alone, established nutrient TMDLs for 47 subwatersheds and otherwise addressed nutrient impairment in 22 additional subwatersheds (a state priority for over a decade) and provided a foundation for New Jersey's Nutrient Criteria Enhancement Plan.

- The Department amended the Surface Water Quality Standards rules at N.J.A.C. 7:9B in 2008 and upgraded an additional 700 river miles to the Category One antidegradation designation. Category One designation provides additional protection to help prevent water quality degradation and maintain the level of water quality needed to attain drinking water supply, recreation, fishing, and shellfish harvest uses.

- The Department adopted amendments to the Water Quality Management Planning Rules at N.J.A.C. 7:15 in July 2008. This rule will require the development of county-wide water quality management plans that identify the future wastewater treatment needs for each county and identify appropriate and adequate wastewater treatment and disposal options to meet that demand. The new rules also establish a septic density to maintain groundwater quality, require best management practices for stormwater, provide for the protection of riparian areas and steep slopes, and implement controls on other nonpoint sources of pollution, and considers water supply availability.

- The New Jersey Environmental Infrastructure Financing Program issued low interest loans totaling almost $800,000,000 dollars in State Fiscal Years (SFY) '05 and '06 for approximately 100 Clean Water, Land Acquisition and Drinking Water Projects that will protect, maintain, or improve water quality.

- The Department issued $4,877,551 in Section 319(h) Nonpoint Source Pollution Control grants to 16 entities in SFY '04 and '05 primarily for implementation of Department-approved watershed-based plans and continued development of Watershed Restoration and Protection Plans designed to restore impaired waters and to protect and maintain unimpaired waters in targeted watersheds.

- The Clean Shores Program removed over five million pounds of floatables from 155 miles of shoreline in 2006. From 2004 through 2006, the Adopt-A-Beach program removed over 120,000 items of trash that would otherwise have become pollution in New Jersey's coastal waters.

- For Fiscal Year 2006, the Department coordinated with the New Jersey Department of Agriculture on the administration of $9,572,113 in 2002 Farm Bill funds allocated to New Jersey by the U.S. Department of Agriculture to reduce or eliminate agricultural sources of water pollution.

- The Green Acres Program acquired a total of 77,641 acres of land between July 1, 2002 and March 1, 2007, primarily to protect water quality through the preservation of land that would otherwise be developed.

- The Department adopted amendments to the NJPDES rules that require major facilities discharging to PCB-impaired waters to monitor their effluent for PCBs, some of which will also be required to develop and implement PCB Pollutant Minimization Plans that will lead to the identification and elimination of PCB-contaminated areas on facility sites.

- The Department adopted amendments to the NJPDES rules entitled "Requirements for Dental Facilities" that will reduce mercury discharges from dental facilities into publicly-owned treatment works (POTW), which are often not equipped to treat wastewater for such heavy metals. Mercury not removed by a POTW's treatment process is discharged into the surface waters of the State. Therefore, reducing/eliminating the amount of mercury entering POTWs from dental amalgam will reduce the amount of mercury entering surface waters.

- Solids and floatables control facilities were constructed and operational at 70% of New Jersey's Combined Sewer Overflow (CSO) discharge points, as of September 2007. These facilities removed about 600 tons of solids and floatables materials during calendar year 2006.

- Fifty-six out of 276 CSO points in New Jersey have been eliminated through consolidation and/or sewer separation. Thus, more sewage is being directed to wastewater treatment plants for treatment rather than diverted and released, untreated, via CSOs.

- Between April 1, 2005 and April 1, 2006, stormwater pollution prevention plans were developed by 97% of municipalities, 91% of highway agencies, and 86% of public complexes[3] regulated under the Department's new Municipal Stormwater Regulation Program. Street sweeping and catch basin cleaning by these agencies resulted in the removal of 170,000 tons of material from 360,000 miles of roads and 13,000 tons of material from over 200,000 catch basins, for a total of 183,000 tons of material that would otherwise have been discharged via storm sewers to waters of the State.

[3] Public complexes include large, publicly-owned, or operated military bases, colleges, and hospital complexes.

Preparing for 2010 and Beyond:

The Department has continued to make significant improvements to New Jersey's water quality monitoring and assessment reports. The 2008 Integrated Report describes improvements in monitoring and assessment methods made since the 2006 Integrated Report, as well as other actions taken by the various water quality programs to restore and protect the water quality of New Jersey's waters. The 2010 Integrated Report is expected to reflect the following actions:

- Issuance of NJPDES discharge permits containing new effluent limits for total phosphorus necessary to achieve the wasteload allocations established in the Passaic River Basin TMDL;

- Implementation of 16 watershed restoration and planning projects funded with almost $5 million dollars in Section 319(h) Nonpoint Source Pollution Control grants awarded in SFY '04 and '05;

- Implementation of over 100 Clean Water, Land Acquisition, and Drinking Water projects funding with approximately $800 million dollars in New Jersey Environmental Infrastructure Trust loans awarded in SFY '05 and '06;

- Enhanced assessment methodologies, including a new nutrient assessment method for wadeable streams, to address amendments to the New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B) for nutrient criteria, pH, and temperature; and

- Additional trends analysis for physical/chemical parameters monitored in freshwater non-tidal streams.

The Department recognizes that the monitoring and assessment process requires continuous re-evaluation and refinement based on scientific advancement to fill data gaps, and to address new and emerging issues. The Department is also seeking and implementing improved efficiencies in monitoring and assessment methods, especially in light of the resource constraints imposed by the current state, national, and global economy. The Department plans to make the following refinements for the 2010 Integrated Report, if sufficient resources are available:

- Prioritize monitoring efforts to continue to work toward the Clean Water Act goal of assessing all waters for all designated uses;

- Develop and implement the New Jersey Water Quality Data Exchange System to enable the submission of monitoring data from external monitoring organizations in a uniform, electronic format to provide more efficient integration and assessment of the data;

- Explore the use of USEPA's recommended methyl mercury fish tissue criteria to better assess the fish consumption use. Studies are underway to develop bioaccumulation factors (BAF) to derive criteria to appropriately protect New Jersey waters; and

- Continue to seek increased external high quality data for use in the Integrated Report by working with the New Jersey Water Monitoring Council, the Volunteering Monitoring Network, and other external monitoring partners.

The Department also continues to improve and enhance its water quality management programs, and to better relate these actions to documented changes in water quality status and trends.

About The Report

The 2008 Integrated Report is organized into a main report (Chapters 1 through 9), which serves as a summary document explaining each aspect of the water quality assessment process and the overall results; and an appendix (Appendices A through L), which includes the reports, findings, methods, and other documentation supporting the results of the statewide water quality assessment. Chapter 4 of the main report summarizes and explains the results of the 2008 Water Quality Assessment. The appendices include the Integrated List of Waters (Appendix A), the 2008 303(d) List of Water Quality Limited Waters ("List of Impaired Waters"), including priority ranking for TMDLs (Appendix B), the Delisting Document (Appendix C), and the Methods Document (Appendix F). The full text of the Integrated Report and the Appendices are available for download at http://www.state.nj.us/dep/wms/bwqsa/generalinfo.htm.

Chapter 1: Overview

New Jersey's Integrated Water Quality Monitoring and Assessment Report

Federal Reporting Requirements

The federal Clean Water Act mandates that states submit biennial reports to the U.S. Environmental Protection Agency (USEPA) describing the quality of their waters. The biennial Statewide Water Quality Inventory Report or "305(b) Report" must include the status of principal waters in terms of overall water quality and support of designated uses, as well as strategies to maintain and improve water quality. The 305(b) reports are used by Congress and USEPA to establish program priorities and funding for federal and state water resource management programs. The biennial List of Water Quality Limited Waters or "303(d) List" identifies waters that are not attaining designated uses because they do not meet surface water quality standards despite the implementation of technology-based effluent limits. States must prioritize waters on the 303(d) List of Water Quality Limited Waters for Total Maximum Daily Load (TMDL) analyses and identify those high priority waters for which they anticipate establishing TMDLs in the next two years. Since 2002, New Jersey has developed and submitted its 303(d) List as part of the Integrated Report. The Integrated Report satisfies the reporting and public participation requirements of Sections 303(d), 305(b), and 314 of the federal Clean Water Act.

The 2008 Integrated Report

The 2008 New Jersey Integrated Water Quality Monitoring and Assessment Report (Integrated Report) describes the quality of New Jersey's surface waters in terms of overall water quality and support of designated uses. Data used in the 2008 Integrated Report was generally collected between January 1, 2002 and December 31, 2006. The Integrated Report identifies high quality waters that are attaining designated uses (Sublists 1 and 2 of the Integrated List of Waters), lower quality waters that are not attaining designated uses (Sublists 4 and 5), and waters for which insufficient information is available to assess water quality and use attainment (Sublist 3). The Integrated Report also identifies strategies implemented by the State to maintain high quality waters, improve lower water quality waters, and gather sufficient information to assess all waters of the State. The information provided in the Integrated Report is used by Congress, USEPA, and the State of New Jersey to establish program priorities and funding for federal and State water resource management programs for maintaining and restoring water quality, including the development of Total Maximum Daily Loads (TMDLs) for waters that do not meet surface water quality standards despite the implementation of technology-based effluent limits, as identified on the List of Water Quality Limited Waters (303(d) List).

The Integrated Report provides the following information to inform and guide water resource management at statewide, regional, and local levels:

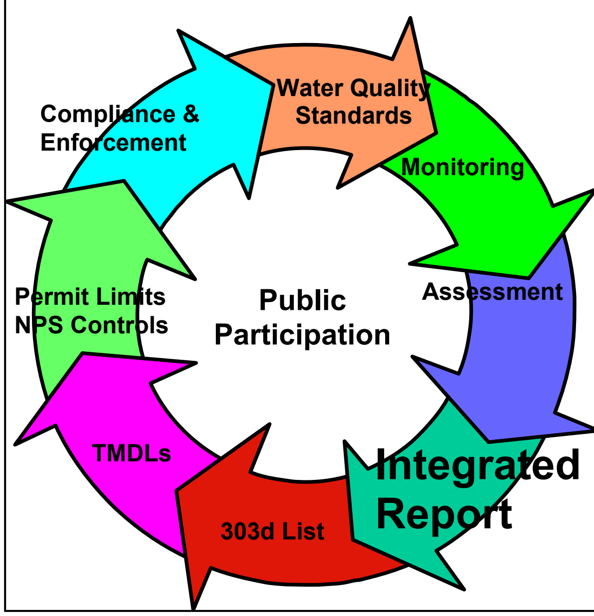
- Surface water classifications and water quality criteria established in the New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B) to protect the designated uses: aquatic life; recreation; drinking, industrial, and agricultural water supply; fish consumption, and shellfish harvest for consumption;

- Organizations providing data to the Department pursuant to the Data Solicitation Notice issued January 20, 2007;
- Methods used to assess attainment of the designated uses;
- Water quality assessment results are based primarily on surface water quality monitoring conducted between January 1, 2002 and December 31, 2006;
- Identification of high quality waters that support all designated uses;
- Identification of waters that do not meet one or more designated uses, the pollutant(s) causing the problem, and priority ranking for TMDL development;
- Status and trends regarding water quality conditions and use attainment of all waters of the State; and
- Management strategies and actions taken to protect and improve water quality, such as the adoption of TMDLs to achieve water quality standards and attain designated uses.

Goal of the Integrated Report

The goal of the Integrated Report is to provide information about the quality of New Jersey's waters that will inform water resource managers and the public on the status of designated use attainment as well as the actions needed to achieve attainment of all designated uses in all waters of the State. As illustrated in Figure ES-1, the Integrated Report is a key part of the process for managing and protecting the State's water resources. This process, as described in the federal Clean Water Act, includes standards development (Chapter 5); monitoring (Chapter 2); assessment (Chapters 3 and 4); identification and implementation of management strategies (including TMDLs, point and nonpoint source controls, and other water quality programs described in Chapter 5), and compliance and enforcement (Chapter 5). The public is afforded the opportunity to participate in each step of the process.

Figure ES-1: Water Resource Management



New Jersey's Water Resources

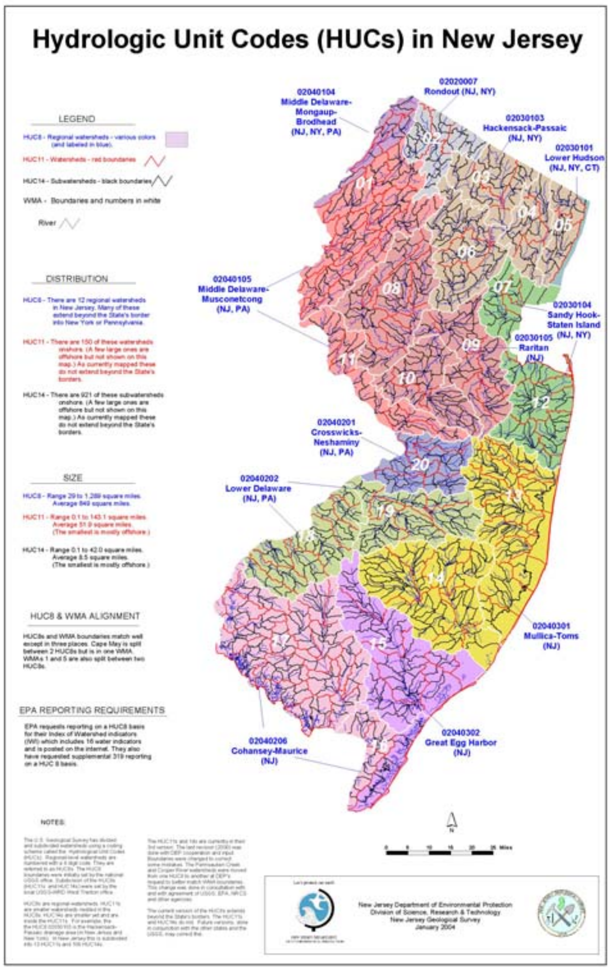
New Jersey is the fifth smallest state in the nation and is one of the most geologically and hydrogeologically diverse. New Jersey contains a wide variety of land use types, water resources, geologic characteristics, and natural biota. Approximately 8.4 million people live within New Jersey's 7,505 square miles, making it the most densely populated state in the nation. Land use in New Jersey can be broadly categorized into urban/suburban, agricultural, and undeveloped. Highly concentrated and expanding urban and industrial centers along with shrinking agricultural and undeveloped areas characterize New Jersey's current land use trends. Because of the high population and variable land uses, the State's streams, lakes, ponds, bays, ocean and ground water are impacted to varying degrees by point and nonpoint sources of pollution. A summary of the State's population and water resources is presented in Table 1, below:

Table 1: New Jersey Water Resources

Resource	Extent
State Population (2000)	8,414,350
State Total Area (square miles)	8,204
State Total Land Area (square miles)	7,505
Rivers and Streams	
Miles of nontidal rivers and streams	11,702
Miles of tidal rivers and streams	6,424
Miles of rivers and streams (total)	18,126
Border miles shared rivers/streams (nontidal and tidal)	197
Lakes, Ponds and Reservoirs	
Number of named lakes and ponds	1,747
Acres of named lakes and ponds	37,834
Number of Reservoirs	43
Acres of Reservoirs	14,970
Total Acres of named lakes and ponds and reservoirs	52,804
Number of significant publicly owned lakes/reservoirs/ponds	380
Acres of significant publicly owned lakes/reservoirs/ponds	24,000
Estuaries and Ocean	
Square Miles of Estuaries	260
Miles of Ocean Coast (linear miles)	127
Miles of Ocean Coast (sq. mi. of jurisdictional waters)	454
Wetlands	
Acres of Freshwater Wetlands	739,160
Acres of Tidal Wetlands	209,269

New Jersey selected the Hydrologic Unit Code (HUC) 14 subwatershed boundary as the scale (i.e., assessment unit, or "AU) for assessing its waters, except for the Delaware River mainstem, Estuary, and Bay. HUCs are geographic areas representing part or all of a surface drainage basin or distinct hydrologic feature, as delineated by the U.S. Geological Survey (USGS) in cooperation with the National Resources Conservation Service (NRCS). The HUC system starts with the largest possible drainage area from which progressively smaller subdivisions of that drainage area are then delineated and numbered in a nested fashion. There are currently 950 HUC 14 subwatersheds in New Jersey[1]. HUC 14 subwatersheds range in size from 0.1 to 42 square miles, with an average size of 8.5 square miles. The Department's GIS database contains a coverage containing discrete polygons for each of New Jersey's 950 HUC 14 subwatersheds. The Department uses the 20 Delaware River Zones designated by the Delaware River Basin Commission (DRBC) to assess the Delaware River mainstem, Estuary, and Bay, resulting in a total of 970 AUs assessed for the 2008 Integrated Report.

Figure 1: New Jersey's Watershed Management Areas and Water Regions



[1] These 950 HUC 14 subwatersheds are "nested" within 151 HUC 11 watersheds, which comprise New Jersey's 20 Watershed Management Areas (WMAs).

Chapter 2: Summary of Water Quality Monitoring Programs

In March 2003, the U.S. Environmental Protection Agency (USEPA) issued national guidance for developing a State Water Quality Monitoring and Assessment Strategy to ensure compliance with the federal Clean Water Act. Under this guidance, all states were required to develop a comprehensive, ten-year, long-term water monitoring strategy containing nine key elements to continue receiving federal Clean Water Act Section 106 grant funds. The Department finalized *New Jersey's Water Monitoring and Assessment Strategy (2005-2014)* in September 2004 (see Appendix G). Based on this Strategy, New Jersey's water monitoring programs are expected to cover all waters of the State, including streams, rivers, lakes, reservoirs, estuaries, coastal areas, wetlands, and ground water. An updated description of New Jersey's Water Monitoring Programs is provided in the 2008 Water Quality Monitoring Networks Report, from which excepts are provided below.

Freshwater Monitoring Program

The Ambient Surface Water Quality Monitoring Network (ASWMN) is a cooperative monitoring program established between the Department and the U.S. Geological Survey (USGS) designed to achieve the following objectives 1) track status and trends in ambient water quality; 2) establish background water quality; 3) obtain water quality data that can be correlated with specific land uses (urban/suburban, agricultural and undeveloped); and 4) coordinate water chemical and biological monitoring networks. The ASWMN consists of 215 stations that are sampled quarterly. Sampled parameters include: discharge, field parameters, filtered common ions, total and filtered nutrients, suspended solids, and biological oxygen demand (BOD), which are all monitored quarterly; and metals (spring high flow and summer low flow), which are monitored biannually. Pathogenic indicators are sampled five times in 30 days. Diurnal dissolved oxygen (DO), pesticides, sediment metals, sediment nutrients, and sediment polyaromatic hydrocarbons are also monitored annually at selected sites.

The Ambient Biological Monitoring Network (AMNET) consists of over 800 stream sites to provide long-term biological data reflecting the quality of surface waters throughout the State. AMNET routinely samples and analyzes aquatic macroinvertebrate populations at each site, employing USEPA-developed Rapid Bioassessment Protocol (RBP) methods to provide an index of stream water and habitat quality. Sites in each of New Jersey's five Water Regions (Upper Delaware, Northeast, Raritan, Atlantic, and Lower Delaware) are sampled on a five-year rotational basis to allow time for recovery from possible transient environmental impacts, and to establish trends in water and habitat quality. Three new indices have recently been developed based on the genus level taxonomy and geographical regions: high gradient (above the Fall Line), low gradient (Coastal Plain excluding Pinelands), and Pinelands (the boundary of the Pinelands National Reserve plus a 5-kilometer buffer). Additional information on the three new indices is provided in the *2008 Integrated Water Quality Monitoring and Assessment Methods* (Methods Document), Section 4.3 Biological Data.

The Ambient Lakes Monitoring Network consists of 200 lakes that are randomly selected from the State's 1100 named lakes. Each of the 200 lakes is sampled once every five years, with forty lakes sampled each year. Up to four sampling locations are monitored within each lake for parameters such as DO, pH, nutrients, and Chlorophyll *a*. Design of the lake monitoring network is discussed in more detail in Section 3.4, Assessment of Probabilistic Monitoring Data.

The Volunteer Monitoring Program provides a comprehensive approach to water quality monitoring by utilizing certain data generated by trained citizen volunteers. Many of these volunteers are represented by organizations that have their own long-standing monitoring programs throughout the state; these groups participate in the Department's volunteer monitoring program through an umbrella advisory council called the Watershed Watch Network (WWN). A four-tiered approach has been developed to facilitate the appropriate use of data generated by WWN member organizations and incorporate this data into various applications at the state level, from education and stewardship to indicators and regulatory response. Quality controls, with increasingly rigorous requirements, are applied as the tiers progress (e.g., USEPA-approved Quality Assurance Project Plan, Department-sponsored training, and use of certified labs for analysis of samples). Additional information about the Department's Volunteer Monitoring Program is provided in Chapter 5, Section 5.11 (Water Education and Outreach).

Targeted Surface Water Monitoring Efforts

In addition to the water monitoring networks described above, the Department also conducts targeted physical, chemical, and biological water monitoring as needed to address specific water resource issues, such as re-evaluation of waters previously listed as impaired on New Jersey's Impaired Waterbodies List ("303(d) List"), development and implementation of total maximum daily loads (TMDLs), and in response to environmental spills. Additional information on these efforts is provided in the NJ Water Quality Monitoring Networks 2008 report.

Coastal Water Quality Monitoring Program

The Coastal Water Quality Monitoring Network is designed to provide basic measures of the ecological health of New Jersey's coastal waters (including ocean, estuarine, and tidal river waters). Temperature, salinity, suspended solids, and oxygen measurements provide information on the degree of environmental stress to which coastal organisms are exposed. Nutrients (nitrogen and phosphorus) and chlorophyll *a* relate to the amount of plant material in the water. Too much or too little plant material in the water can be detrimental to other organisms in the bay and ocean. The Coastal Monitoring Network monitors parameters such as DO, salinity, nitrogen, phosphorus, Secchi depth, temperature, chlorophyll *a*, and suspended solids. Samples are collected four times per year (once each quarter) at approximately 270 locations.

The National Coastal Assessment (NCA) is a federally funded program to assess the ecological condition of the Nation's estuarine resources. NCA's annual summer sampling involves collection of water, sediment, and benthic invertebrate samples at 35 locations in New Jersey's coastal bays. Samples are analyzed for water chemistry (e.g., nutrients, dissolved oxygen), sediment chemistry/toxics, sediment toxicity, and benthic diversity. Results from this program are used in USEPA's National Coastal Condition Reports. Results from NCA sampling are also being used by the Department to assess ecosystem impairment in the New York-New Jersey Harbor Estuary. Through a collaborative effort between USEPA, the Department, and Rutgers University, research is currently underway in New Jersey to expand NCA's assessment of the

State's (and subsequently the nation's) nearshore ocean waters. More detailed information about NCA is provided under Section 2.2, Probability-based Monitoring.

The Cooperative Coastal Monitoring Program (CCMP) is administered by the Department with the participation of local environmental health agencies. The CCMP assesses nearshore coastal water quality and investigates sources of water pollution. The CCMP also enables local health agencies to respond to immediate public health concerns arising from contamination in coastal recreational areas. Under the CCMP, local health agencies monitor concentrations of enterococci in coastal waters. The local health agencies collect water samples each week and perform the analyses for enterococci concentrations at 188 ocean and 76 bay monitoring stations. These bacteria are indicators of fecal contamination from various point and nonpoint sources.

As part of the CCMP, the Department performs aerial surveillance of nearshore coastal waters. The Department conducts six flights per week over areas including Raritan Bay, the Lower New York Bay, and the Atlantic coast from Sandy Hook to Barnegat Inlet. Twice a week, flights are extended to include the area from Barnegat Inlet to Cape May Point. As part of the New York-New Jersey Harbor Estuary Program Floatables Action Plan, the Department coordinates flight activities with the U.S. Army Corps of Engineers' efforts to capture floating solid waste and debris, also known as floatables, with water-skimming vessels. For more information on the Department's Clean Shores Program and other floatables control measures, see Chapter 5, Section 5.5: Nonpoint Source Pollution Control Program. Additional information on the CCMP-Beach Water Quality Monitoring Program is available on the Department's Web site at http://www.njbeaches.org.

National Shellfish Sanitation Program: The Department maintains a network of more than 1,600 active monitoring stations throughout the State's coastal waters. These stations are sampled between five and twelve times each year for total coliform and fecal coliform bacteria (indicators of human pathogens). The resulting data are analyzed for compliance with federal standards for shellfish sanitation. Of principal concern are indicators of human pathogens in the water that may be transmitted to consumers through the harvest and consumption of tainted shellfish. Each year the most recent water quality data and shoreline survey information are assessed for compliance with the National Shellfish Sanitation Program (NSSP) guidelines. Waters not in compliance are closed to shellfish harvesting. New Jersey has been very successful in improving water quality for shellfish harvesting. For 15 consecutive years, New Jersey has upgraded more waters than it has downgraded for shellfish harvesting. Currently, 90% of the State's shellfish waters are harvestable. As of the last national survey of shellfish waters in the United States, New Jersey was the leading state in the restoration of coastal shellfish waters.

Coastal Phytoplankton Monitoring Network: Every summer, the Department, in collaboration with USEPA Region 2, monitors phytoplankton populations in the waters along the 127 miles of New Jersey's coastline and major estuaries. Under NSSP guidelines, the Department maintains a network of 16 stations as part of the state contingency plan to monitor marine biotoxins. The stations are sampled biweekly from May through August each year. Starting in 2006, Chlorophyll *a* levels have also been measured through aerial overflight remote sensing.

Ambient Ground Water Monitoring Network

New Jersey's Ambient Ground Water Monitoring Network is a cooperative monitoring program administered by the Department and USGS, which consists of 150 wells screened at the water table. The network was redesigned in 1998 to address the following objectives: 1) assess status and trends in newly recharged ground water; 2) define ground water quality by land use type (urban/suburban, agricultural, and undeveloped); 3) determine potential ground water impacts on surface water quality; and 4) identify emerging ground water quality issues.

Network installation and the first round of sampling were completed in 2004. Well locations were identified using a stratified random approach, based on land use type. Sixty wells are located in urban/suburban settings, 60 wells are located in agricultural settings, and 30 wells are located in undeveloped settings. With a sampling rate of 30 wells per year, sampling frequency for network wells is once every five years. Sampled parameters include field parameters (specific conductance, pH, alkalinity, DO, water temperature, and turbidity) and laboratory parameters (dissolved major ions and trace elements (metals), dissolved nutrients, volatile organic compounds, pesticides, and gross alpha/beta). Ground water quality data are currently available from the Department's Geographic Information System (GIS) at http://www.state.nj.us/dep/gis and in annual USGS Water Resources Reports for New Jersey and the USGS NWIS database (available at http://waterdata.usgs.gov/nwis/.)

Future improvements to this monitoring program include the integration and comparison of network data with data collected as a result of the Private Well Testing Act and the Ambient Stream Monitoring Network data to evaluate causal relationships in water quality. See Appendix H for a complete report on the New Jersey Ambient Ground Water Monitoring Network.

Except as noted in the above sections, additional information these water monitoring activities and networks is available on the Department's Web site at: http://www.nj.gov/dep/wms/.

Chapter 3: Water Quality Assessment

3.1 Summary of Assessment Methods

The methods used to develop New Jersey's 2008 Integrated Report are described in the *2008 Integrated Water Quality Monitoring and Assessment Methods* (Methods Document). The purpose of the Methods Document is to articulate the objective and scientifically sound methods employed by the Department for monitoring and assessing the quality of New Jersey's waters, in accordance with Sections 305(b) and 303(d) of the federal Clean Water Act, including:

- A description of the data the Department uses to assess attainment of the designated uses;
- The quality assurance aspects of the data;
- A detailed description of the methods used to evaluate designated use attainment;
- The rationale for the placement of waterbodies on the five sublists of the Integrated List.

The Department updates the Methods Document every two years, prior to development of the Integrated List. The final 2008 Methods Document, along with the Department's responses to public comments on the draft 2008 Methods Document, is provided in Appendix F of this Integrated Report. Assessment methods for the Delaware River were developed by the Delaware River Basin Commission (DRBC), located at 25 State Police Drive, P.O. Box 7360, West Trenton, New Jersey 08628-0360. DRBC's Methods Document is available on their Web site at http://www.state.nj.us/drbc/public.htm.

Major changes incorporated into the 2008 Methods Document are outlined below. A more detailed summary of these changes in provided in Section 1.2 of the 2008 Methods Document.

- **Biological Assessment:** Three new biological indexes were developed based on genus level taxonomy for assessing benthic macroinvertebrate data. The three indexes were developed for different physiographic regions of the State. The High Gradient Macroinvertebrate Index (HGMI) applies to the streams of northern ecoregions (Highlands, Ridge and Valley, and Piedmont). The Coastal Plain Macroinvertebrate Index (CPMI) applies to the Coastal Plain (excluding waters considered Pinelands (PL) waters). The Pinelands Macroinvertebrate Index (PMI) applies to PL waters as well as FW2 waters within five kilometers of the Pinelands Area.

- **Lake Assessment:** The Department is integrating lakes into their corresponding HUC 14 subwatershed assessment units (AU). The assessment results for a given AU will reflect the water quality and use attainment status of the streams, rivers, and lakes located within it. Thus, New Jersey will have one Integrated List with 970 total assessment units rather than two lists (one for all waters except lakes and another for lakes). Lakes formally assessed as impaired for recreation due to poor aesthetics (brought about by eutrophication) will be assumed to be nutrient-impaired under the Aquatic Life Use (the assessment method for "Recreation Aesthetics" has been removed from the Methods Document since "Recreation Aesthetics" is not a designated use in the SWQS).

- **Naturally low pH:** New Jersey currently has two surface water quality criteria for pH, one criterion (generally 3.5-5.5) for the naturally acidic Pinelands waters, and another (6.5-8.5) for all other waters of the State. Pinelands waters (PL) were designated based on political boundaries that delineate the "Pinelands Area" of the State. The true extent of the low pH, low buffer capacity waters historically characteristic of the New Jersey Coastal Plain "Pinelands" lies well beyond this political boundary and is closely aligned with the underlying geology of the region. The Coastal Plain has hydrologic and geological conditions that are very similar to the Pinelands. The result is that the current pH criteria do not address the naturally acidic conditions of the Coastal Plain waters located outside of the Pinelands Area.

  New Jersey is currently developing a new pH criterion with a wider range (4.5-7.5) for the Coastal Plain waters located outside of the Pinelands Area boundary. The Department is reevaluating impairments attributed to low pH in Coastal Plain waters where soil and vegetation are similar to Pinelands conditions, and is delisting pH where low pH values reflect natural conditions (also see 2008 Methods Document "Natural Conditions" in Section 3.2 Criteria and Policies).

- **Recreational Use Assessment:** The Department will no longer be assessing "Secondary Contact Recreation" in FW, SE1, or SC waters since there are no applicable surface water quality criteria with which to assess this use in these waters. The Department will continue to assess the more stringent Primary Contact Recreation use, based on the criteria established in the SWQS for primary contact recreation in freshwaters. The Department will also continue to assess secondary contact recreation for saline waters, based on the criteria established for SE2 and SE3 waters.

- **Temperature:** The 2008 Methods Document contains a new methodology for assessing compliance with the new temperature criterion for trout production waters adopted by the Department in October 2006 based on a summer seasonal average.

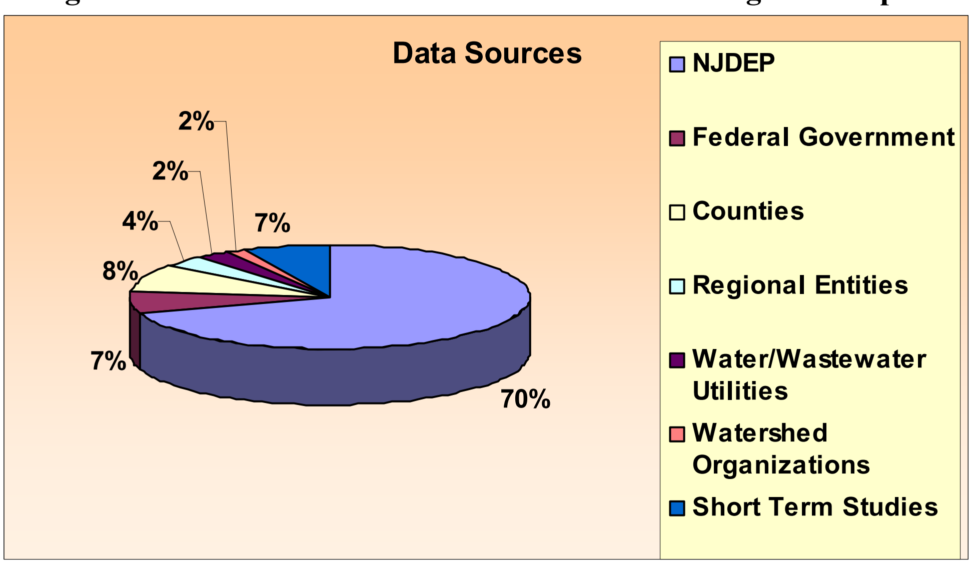
Chapter 3: Water Quality Assessment

3.2 Monitoring Data Used for the 2008 Integrated Report

The Department evaluated all "readily available data" to add new listings for waters that were not previously assessed, and to determine if any of the listings from the 2006 Integrated List should be revised based on new criteria, new methods, or better data. The Department considers "readily available data" to be data that is available to the public, in electronic format, and collected under a Department-, USGS- or USEPA-approved Quality Assurance Project Plan.

In addition to the Department-generated data described in Chapter 2, the Department used data submitted by a variety of other entities, which were submitted in response to the Department's solicitation of water quality data collected over the five-year reporting period that ended December 31, 2006 (see Chapter 8: Public Participation). Overall, a much larger set of data was assessed for the 2008 Integrated Report than that used for the 2006 Report. Not only did the number of chemistry samples increase but there was also an increase in continuous monitoring data. In addition to the Department's Division of Water Monitoring and Standards (WM&S), the Department used data from numerous different entities including federal agencies, county health departments, non-profit organizations (such as watershed associations), municipal utilities authorities (MUAs), and other state and interstate agencies. The relative percentage of data contributed by these sources is depicted in Figure 3.2-1. This figure also shows that 30% of the data available was provided from sources other than the Department's monitoring networks. These other sources include the federal government (USGS and USEPA), county agencies (health departments), regional entities (Delaware River Basin Commission, Interstate Environmental Commission, NJ Meadowlands Commission), water and wastewater utilities, watershed organizations (watershed associations, watershed management groups, and volunteer monitoring organizations), and short terms studies conducted for TMDLs, 319 grant projects, and NJPDES permittees. A complete list of data sources for the 2008 Integrated Report is presented in Appendix E.

Figure 3.2-1: Sources of Data Used for the 2008 Integrated Report



Department-generated data is described in Chapter 2: Summary of Water Quality Monitoring Programs. The Department solicited water quality data and information through a public notice published in the New Jersey Register on February 20, 2007 and the Department's Web site. Data collected between January 1, 2002 and December 31, 2006 was required to be submitted to the Department by August 20, 2007 and to meet the data requirements explained in the notice, including an approved Quality Assurance Project Plan, accurate monitoring sites locations, electronic data format, citable report, and contact information (see Appendix F: Methods Document, Section 3.1 Data Quality) for more information on data requirements).

Chapter 3: Water Quality Assessment

3.3 Trend Analyses

Summary of Water Quality Trends

A trend analysis was conducted in cooperation with the USGS for selected physical and chemical constituents at 36 sampling stations located throughout the State using long-term data (see Figure 3.3-1). Monitoring sites were limited to those that possessed at least 20 years of continuous water quality records and contained flow recordings to correct for the possible impacts from flow variations on instream concentrations through time. The constituents evaluated include dissolved oxygen, total nitrogen, nitrate, total ammonia, total phosphorus, specific conductance, and dissolved solids. The evaluation covered the time period from 1984 to 2004. The sites were located throughout the State, covering all physiographic regions and land uses. Adjustments were made to account for factors such as seasonality and variations in flow. An overall summary of results is displayed in Figure 3.3-2 and Table 3.3-1.

Figure 3.3-1: Water Quality Monitoring Sites Used In Trends Assessment

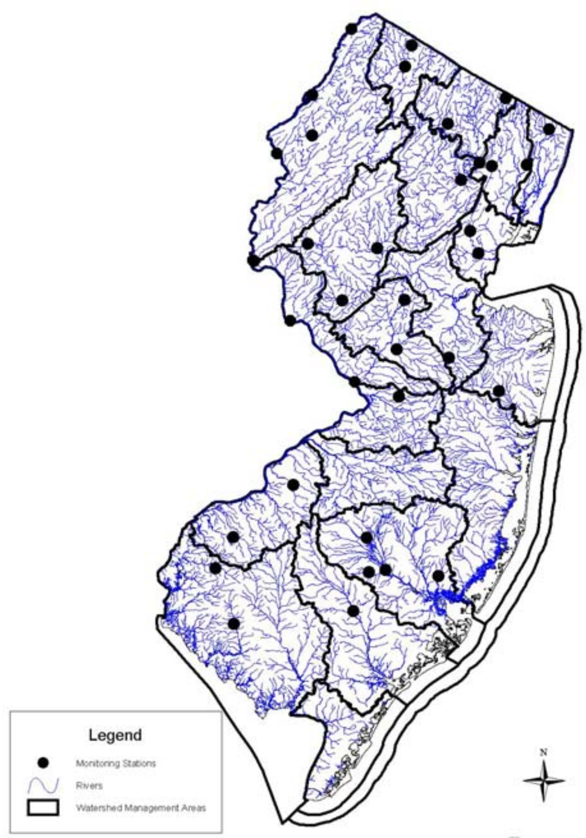
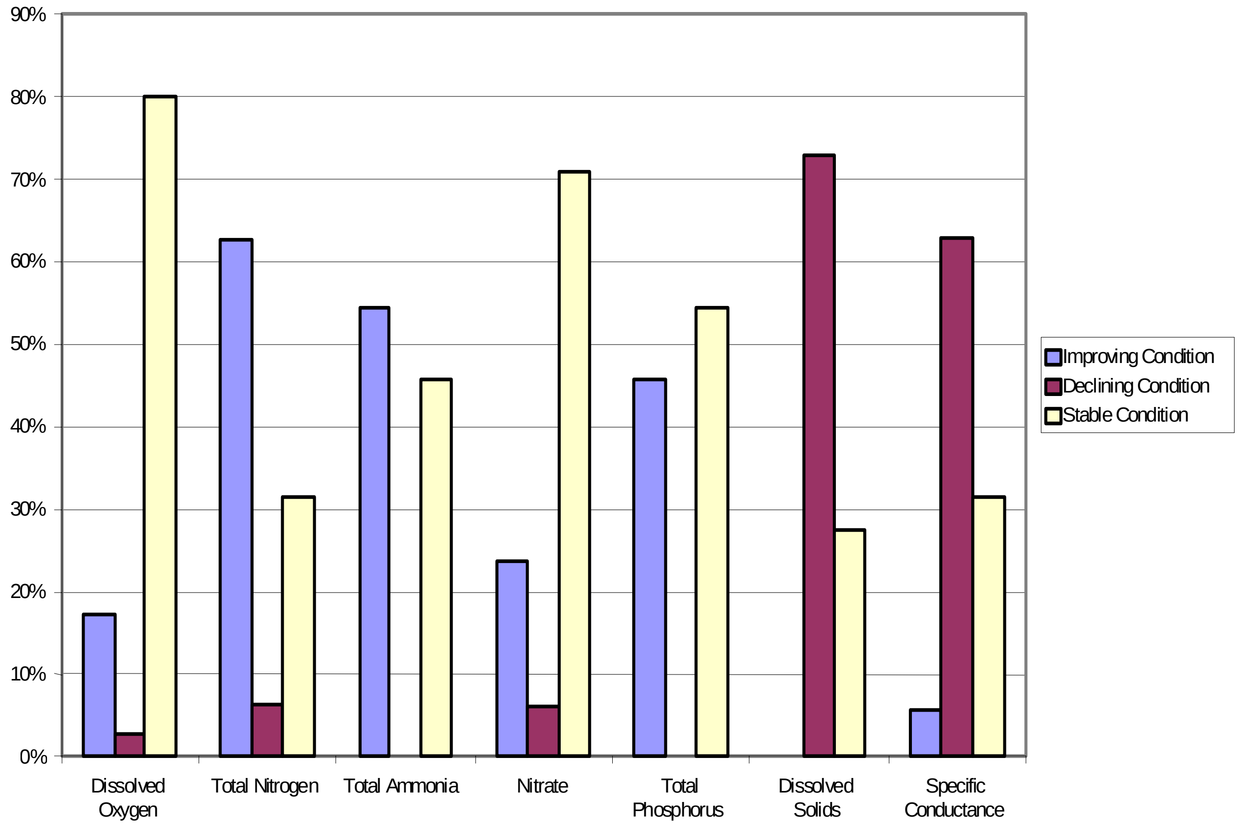


Figure 3.3-2: Trends 1984-2004



The nitrogen species of most interest are nitrate and ammonia because they are the most readily available forms of nitrogen taken up by organisms and plants as a nutrient. Phosphorus is also readily used by organisms and plants as a nutrient. Together, these nutrients are principally responsible for the growth rate of aquatic algae and vegetation. Water bodies affected by eutrophication (i.e., excessive primary production) are characterized by significant algae and weed growth and episodes of low dissolved oxygen. Low dissolved oxygen episodes occur when algae die off, and bacteria consume the dissolved oxygen in the process of decomposition. Dissolved oxygen (DO) is necessary for almost all aquatic life; consequently, concentrations of DO in water provide a good indicator of the health of aquatic ecosystems. Under low DO conditions, fish are more susceptible to other pollutants, such as metals and toxics; at very low DO levels, trace metals from sediments are released into the water column.

Figure 3.3-2 shows trend results in terms of percent of the 36 monitoring sites assessed. Trend results indicate that nutrient levels and DO conditions have improved or stabilized throughout the State. These results are consistent with improvements in water quality expected from upgrades to wastewater treatment plants that have occurred since the 1980's. Nutrient loads, especially ammonia, have been reduced through more extensive wastewater treatment.

The trend analysis also indicates declining conditions for total dissolved solids (TDS) and an associated measure, specific conductance (SC). TDS is comprised of minerals and other substances dissolved in water. Changes in TDS can affect organisms by altering the flow of water through cell membranes, which can retard growth or even cause death. These changes can make water less fit for other uses. TDS exceedances have been associated with runoff from urban and agricultural areas, including runoff of salt used to control ice on roadways. Discharges from wastewater treatment facilities, including septic systems, can also contribute to increased TDS loadings. The TDS and SC trends were found in all types of land uses (urban, agricultural, mixed, and undeveloped) and physiographic regions.

These overall results suggest that for constituents removed by the treatment of point sources, water quality has definitely improved; high biological oxidation demands and the resulting depression of DO levels have generally been addressed. However, these DO results are based on daytime sampling. Diurnal dissolved oxygen monitoring, where available, indicates that DO concentrations fluctuate and may actually drop below the criterion overnight – an indication that nutrients, including phosphorus, may be contributing to excessive plant growth. In addition, dissolved solids continue to be a problem at some locations. Although dissolved solids come from both point and nonpoint sources, road salting and improper salt storage are major contributors of this constituent and need to be better addressed by the Department's water quality management programs (Chapter 5).

Additional trend assessments are currently being developed for the 78 permanent stations in the NJDEP/USGS Ambient Stream Monitoring Network. Station-specific trend assessments for dissolved oxygen, nitrite + nitrate, phosphorus, kjeldahl nitrogen, pH, and total dissolved solids will be developed for the time period of 1998 through 2006. This new assessment will update the previous trends reports (see Trends in Water Quality of New Jersey Streams, Water Years 1986-95, USGS Water-Resources Investigations Report 98-4204 and Water-Quality Trends in New Jersey Streams, USGS Water-Resources Investigations Report 90-4046). Additional ambient data summaries are planned and will include biennial data summaries of the most recent ambient network data, status and trends assessments of data from randomly selected sites, and trend assessments for additional parameters, such as *E. coli* and trace metals.

Table 3.3-1: Summary of Water Quality Trends for Selected Water Quality Constituents

	SC	DO	DO_SAT	TN	NH3	NO3	TP	TDS
UP	22	6	7	2	0	2	0	24
DOWN	2	1	5	20	19	8	16	0
NONE	11	28	23	10	16	24	19	9
UP	63%	17%	20%	6%	0%	6%	0%	73%
DOWN	6%	3%	14%	63%	54%	24%	46%	0%
NONE	31%	80%	66%	31%	46%	71%	54%	27%

Legend:
SC = specific conductance
DO = dissolved oxygen
DO_SAT = dissolved oxygen saturation
TN = total nitrogen
NH3 = nitrogen
NO3 = nitrate
TP = total phosphorus
TDS = total dissolved solids

Summary of Biological Trends in Benthic Macroinvertebrates

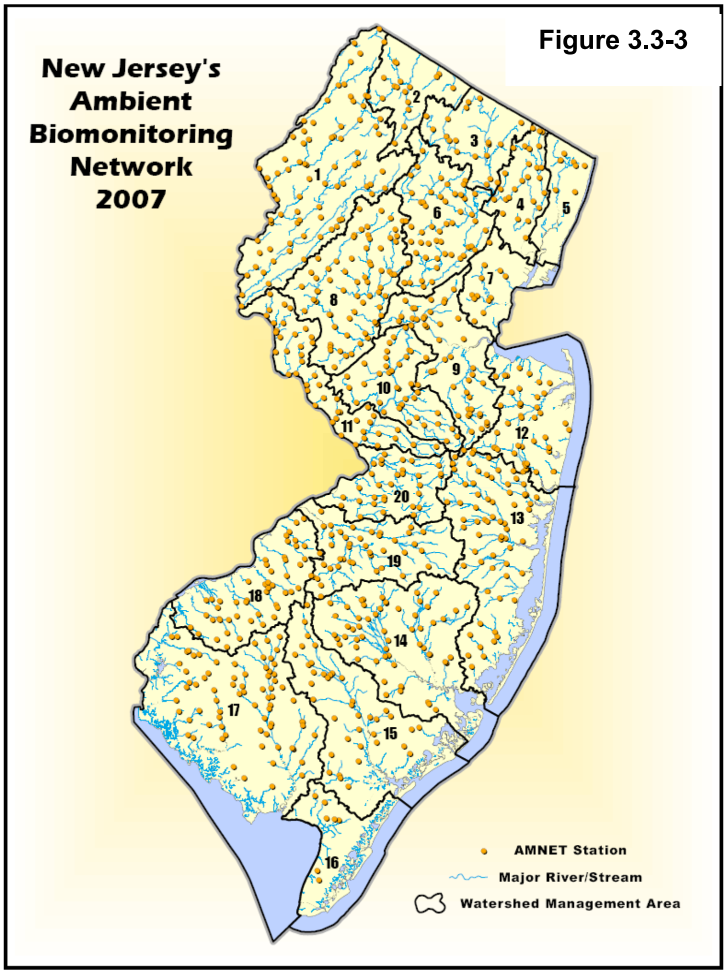


Figure 3.3-3

The federal Clean Water Act requires New Jersey to determine every two years whether New Jersey's waters meet the objectives of the Act, attain state water quality standards, and provide for the protection and propagation of balanced populations of fish, shellfish, and wildlife. Furthermore, the State is required to assess and report on the extent to which pollution control programs have improved water quality.

Historically, the health of aquatic systems has been monitored primarily through chemical means. However, chemical monitoring provides only a "snapshot" of conditions at the time of sampling and may fail to detect acute pollution events, such as runoff from heavy rain; non-chemical pollution, such as habitat alteration; and nonpoint source pollution.

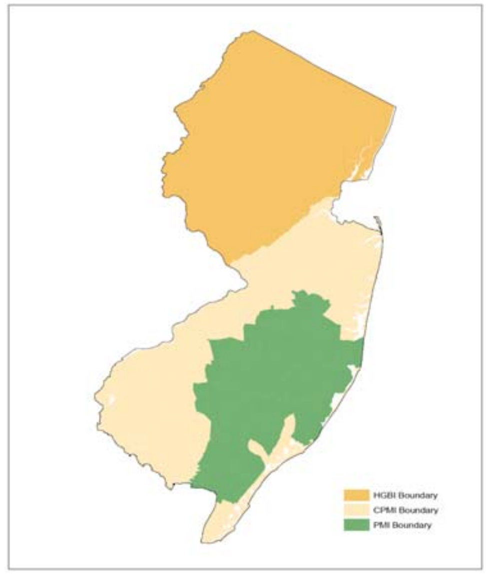
Because of the limitations of chemical monitoring, the Department supplements it with biological monitoring. In 1992, the Department established a statewide Ambient Biological Monitoring Network (AMNET) to collect and assess benthic macroinvertebrate populations (insects, worms, mollusks, and other indicator species) in the State's freshwater streams. The network consists of over 800 stations distributed equally throughout the State's five water regions (Atlantic, Raritan, Lower Delaware, Upper Delaware and Northeast regions). Stations are sampled once every five years in each region on a rotating basis. Procedures for field sampling, sorting, and identification of benthic macroinvertebrates, and determination of the degree of impairment, follow detailed protocols that must be carefully followed to provide consistent data. The primary goal of AMNET is to provide a long-term, cost-efficient means of gauging the quality of surface waters and watershed areas throughout the state. The data generated by AMNET is used in the preparation of water quality and impaired waterbodies reports required by the Clean Water Act.

Trend

In 1996, the first round of statewide AMNET sampling was completed with 762 stations each sampled once. The results generated using the original multi-metric approach known as the New Jersey Impairment Score (NJIS) showed that, statewide, approximately 35 percent of the waters were non-impaired, approximately 53 percent were moderately impaired, and approximately 12 percent were severely impaired.

After the first round of data collection, the Department recognized that the diversity of ecological habitats in the State of NJ required more regionally-specific methods for the interpretation of the raw benthic macroinvertebrate data into a meaningful environmental indicator. Accordingly, the Department worked with USEPA – Region 2 to develop regionally-based Rapid Bioassessment Protocol multi-metric indices covering all the waters of the state. (See Figure 3.3-4). The High Gradient Macroinvertebrate Index (HGMI), the Pinelands Macroinvertebrate Index (PMI), and the Coastal Plains Macroinvertebrate Index (CPMI) provide four tiers of assessment and are applicable to headwater streams.

Figure 3.3-4: Boundaries For Generic Level Index Use

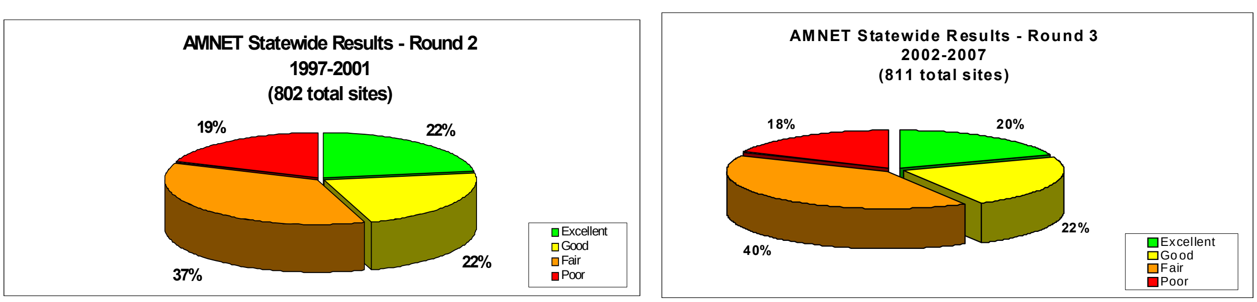


In 2001, the second round of statewide AMNET sampling was completed with 813 stations sampled. The results showed that, statewide, 22 percent of the waters exhibited “Excellent” water quality, 22 percent exhibited “Good” water quality, 36 percent exhibited “Fair” water quality, and 20 percent exhibited “Poor” water quality based upon the condition of the benthic macroinvertebrate community.

In 2007, the third round of statewide AMNET sampling was completed, with 811 stations sampled. The results showed that, statewide, 20 percent of the waters exhibited “Excellent” water quality, 22 percent exhibited “Good” water quality, 40 percent exhibited “Fair” water quality, and 18 percent exhibited “Poor” water quality based upon the condition of the benthic macroinvertebrate community.

A comparison of the results from AMNET Rounds 2 and 3 (see Figure 3.3-5), with 802 common sampling sites, results in 174 stations exhibiting a positive change in rating , 207 exhibiting a negative change in rating, and 421 exhibiting no change in rating. Furthermore, 47 stations jumped more than two impairment ranges (29 negative, and 18 positive).

Figure 3.3-5: Comparison of AMNET Results Rounds 2 and 3



Further investigation is necessary to determine why a site's biological assessment has declined or improved, and if these changes are related to water quality or to events such as droughts and floods. The reasons for these changes are not fully understood and site-specific studies should be performed. The Department is prioritizing selected sites for Stressor Identification studies to determine potential sources/stressors resulting in the impairments.

Outlook and Implications

The AMNET data show a correlation between benthic macroinvertebrate community impairment and different physiographic land types, land uses and other anthropogenic factors. Recent data analysis concludes the following:

1) Fish and invertebrate communities were commonly impaired in urban streams;

2) Invertebrate community impairment was related to total urban land and total wastewater flow upstream of a site;

3) Changes in aquatic community structure were statistically related to environmental variables. For example, an increase in impervious surfaces was related to a negative response in the aquatic invertebrate community. Conversely, the same data analysis also demonstrated that the more forests and wetlands in a stream's drainage basin, the more protection there is for invertebrate community health.

Given the expectations of population growth in New Jersey (an estimated 900,000 more residents by the year 2020) land use changes may have a measurable effect on water quality and aquatic communities. The AMNET network will continue to monitor the effects of that population growth on the aquatic biota of the state's waterways, and provide a measure of success for sound land use practices, additional protections, and mitigation efforts.

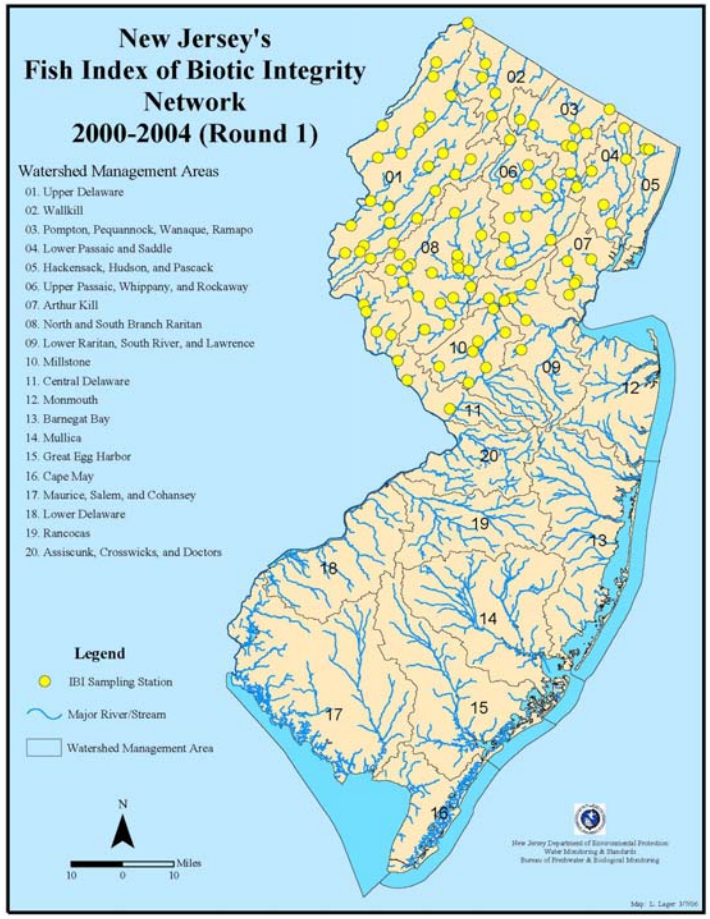
Trends in Fish Index of Biotic Integrity

Monitoring of benthic macroinvertebrate populations is widely practiced in New Jersey. However, these species generally are reflective of short-term and local impairment. To assess environmental conditions on a larger scale, in summer 2000 the Department began to use a fish index of biotic integrity (FIBI) to monitor New Jersey's streams. A FIBI measures the health of a stream based on multiple attributes of the resident fish such as species type and number and the presence of diseases. Each site sampled is then scored based on its deviation from reference conditions (i.e., what would be found in an un-impacted stream) and classified as "poor", "fair", "good" or "excellent." In addition, habitat is evaluated at each site and classified as "poor," "marginal," "suboptimal" or "optimal." Primary objectives of the fish collections are to obtain samples with representative species and abundances, at a reasonable level of effort. Using similar stream lengths, collection methods, and habitat types standardizes sampling efforts. Stream segments selected for sampling must have a minimum of one riffle, run, and pool sequence to be considered representative.

Status and Trends

The data provided by FIBI has become another component of the suite of environmental indicators and helps measure water-quality use attainment and the success in attaining Clean Water Act goals regarding aquatic life. FIBI data may be used to develop biological criteria, prioritize sites for further studies, provide biological impact assessments, and assess status and trends of the state's freshwater fish assemblages.

Figure 3.3-6



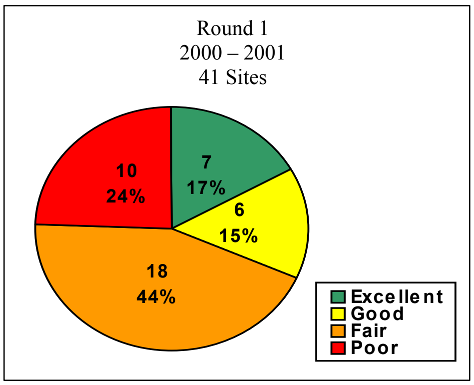
With the completion of the 2004 sampling season, the DEP established a 100 station Fish IBI monitoring network in northern New Jersey (See Figure 3.3-6). Stations will be visited once every five years as part of the Department's ambient monitoring efforts.

The 2006 season marked year two of the second round of sampling, in which the Department returned to those network sites originally sampled in 2001 and 2002. In an effort to ensure sensitivity to anthropogenic stressors, the Northern Fish IBI was re-evaluated in 2005 using Round 1 data (2000-2004). This recalibration resulted in modifications in scoring criteria and species lists for several metrics. The 2006 season is the second year in which the revised metrics will be utilized. Previous year's data (2000-2004) have been rescored for the purposes of trends analysis in this report.

From 2005 – 2006, the Department sampled 41 FIBI sites in the northern portion of the state covering the Counties of Sussex, Warren, Hunterdon, Passaic, Bergen, Union, Essex, Mercer, Middlesex, Morris, and Somerset. A comparison of the 41 sites monitored to date in the 2nd round, which have commonality with 1st round monitoring, is graphically presented in Figure 3.3-7. The comparison in Fish IBI ratings for the northern New Jersey stations is summarized in Figure 3.3-8.

Figure 3.3-7:

Northern Fish IBI Comparisons



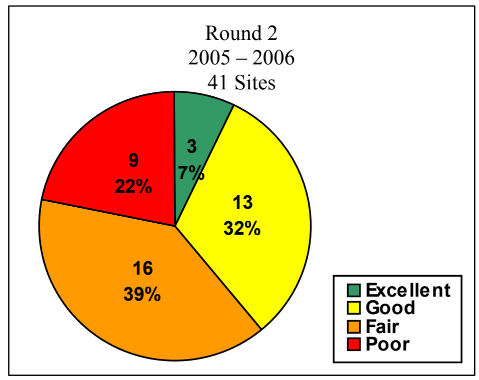
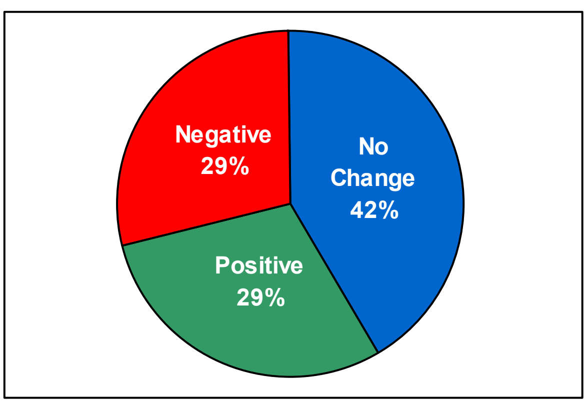


Figure 3.3-8:

Change in Northern Fish IBI Ratings

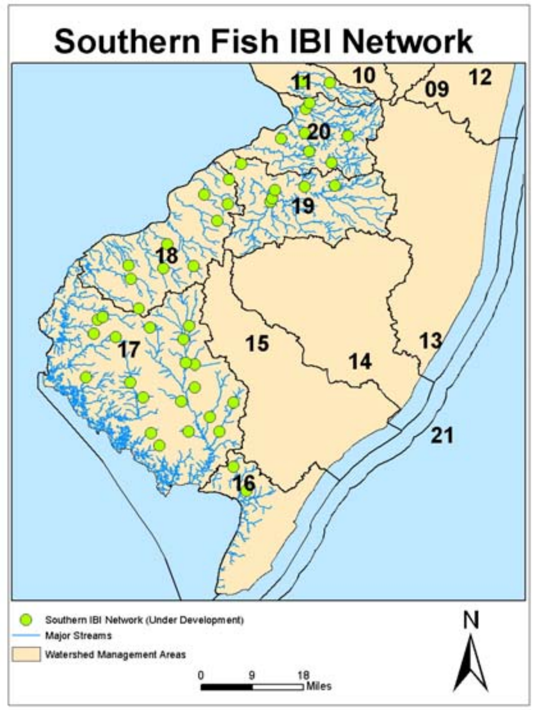


41 Common Sites

Poor → Excellent – 0 Sites
Poor → Good – 1 Site
Excellent → Poor – 0 Sites
Good → Poor – 0 Sites

Outlook

Figure 3.3-9



Southern Fish IBI Network**:**
During the summer of 2007, data were collected for the planned expansion of the network to include portions of southern New Jersey, with the goal of having a statewide network of at least 200 stations by the end of calendar year 2010. Figure 3.3-9 shows the location of the sampling stations monitored in southern NJ to date.

Lakes Fish IBI Assessment:
In general, current lake water monitoring programs lack direct assessment and reporting on biological conditions. This is partly attributed to a lack of development of biological assessment protocols. Through the use of boat electrofishing, fish samples were collected from the littoral zone of 22 lakes in New Jersey during the summers 2002-2006. Fish data was evaluated for the potential development of an index of biological integrity (IBI). Twenty-five species of fish in the families Anguillidae, Catostomidae, Centrarchidae, Clupeidae, Cyprinidae, Cyprinodontidae, Esocidae, Ictaluridae, and Percidae were collected. A set of fish species richness and composition metrics were examined for their general response to a gradient of land use conditions. Our results indicate some attributes of the littoral fish assemblage may be used to assess the ecological health of New Jersey lakes. However, additional information on the responses of the littoral fish assemblage to specific physical habitat and water quality parameters is needed before an IBI can be developed.

More Information

AMNET and FIBI reports are available at www.state.nj.us/wms/bfbm.

Chapter 3: Water Quality Assessment

3.4 Probabilistic Assessments of New Jersey Waters

The Department employs two different types of assessment methodologies to characterize New Jersey's water quality, deterministic and probabilistic. "Deterministic" assessment uses data collected from fixed monitoring locations to characterize the water quality at a specific location. This method can be used for regulatory purposes, such as identifying impaired waterbodies that require TMDLs under Section 303(d) of the federal Clean Water Act, and to quantify change in water quality over time (i.e., trends) at targeted locations. Deterministic assessments used for these purposes are required by USEPA to use all readily available data. "Probabilistic" assessment uses data collected from monitoring stations placed at random throughout the region to be characterized, so that every location has the same likelihood of being selected and monitored as any other location within that region. The results from the selected stations are then extrapolated to provide a representative assessment of the *entire region*. Probabilistic assessment generates spatial quantification of water quality conditions and can be used to characterize the "overall" water quality of an entire region or state, as required under Section 305(b). Probabilistic assessments provide a practical approach for studying an extensive resource, such as all rivers in the State. This is done by examining selected sites through probability (or random) sampling which is considered a Sample Survey. Sample surveys are a cost-effective method to address certain objectives, and the principles underlying such surveys are well developed and documented. The principles of survey design provide the basis for (a) selecting a subset of sampling units from which to collect data, and (b) choosing methods for analyzing the data.

Each type of design and assessment method has distinct advantages. The deterministic assessment can identify the specific location within New Jersey that exceeds the SWQS criterion for a particular pollutant. The probabilistic assessment can indicate that a certain percentage of all the river miles in New Jersey are expected to exceed the SWQS criterion for a particular pollutant. Probabilistic assessments provide broad-brush characterizations that can be applied to an entire region with a known level of confidence. Deterministic approaches provide very site-specific information, but cannot be applied to an entire region with a known level of confidence. The probabilistic assessment can be used to help fulfill the Department's obligations for the purposes of Section 305(b) reporting. However, a deterministic assessment must generally be used to satisfy Section 303(d) requirements.

Probabilistic assessment uses a subset of monitoring sites whose selection is designed to control selection bias; thereby providing a statistically-validated representation of statewide conditions. The development of the Integrated List as well as the 303(d) List of Water Quality Limited Waters is based upon all readily available data which may include studies conducted by federal, state, county, local agencies, volunteer groups, water purveyors and wastewater discharges. The studies may be targeted to address a specific water quality concern. Therefore, a larger universe of monitoring stations is used in the Integrated Report. The Department uses all readily available data to determine whether the designated uses are attained in each assessment unit (HUC 14 subwatershed). The results are applied to the total number of river miles and lake acres within the assessment unit. Generally, the placement of sampling stations tends to be biased towards waters having known or suspected water quality impairments. Because these two methods may generate different results, as explained above, summaries of statewide water quality conditions often differ depending on which method was used.

The Department has begun incorporating the use of probabilistic assessment on a limited basis to identify water quality conditions on a statewide basis. Water resources types for which such assessments are being applied are streams, lakes, and estuaries. Results of these probabilistic assessments, some which are preliminary, are summarized below. The Department is currently working with USEPA's Office of Research and Development to refine some of the NJDEP'S existing applications of probabilistic monitoring and assessment methods, and exploring the adaptation of them to other monitoring activities for future use in assessments.

Assessment of New Jersey Freshwater Streams

The Department completed a statistical assessment of freshwater streams based upon sampling protocols developed cooperatively with USGS and outlined in Appendix 2.1-1 of the *2000 New Jersey Water Quality Inventory Report* (NJDEP, May 2001). The Department's approximately 830-site benthic macroinvertebrate biomonitoring network (also known as AMNET) provides a subset of all potential monitoring locations. From this subset, 40 sites are chosen randomly each two-year monitoring cycle for the purpose of statistically assessing the chemical (and biological) water quality of all freshwater wadeable non-tidal streams in the State. Each new set of 40 monitoring stations is sampled quarterly for two years. This assessment method includes first through fifth-order freshwater, wadeable non-tidal streams, and represents 12,187 river miles. Since 2000, a total of 108 sites have been sampled and assessed, with results converted to river miles. While the 40 sites are not randomly selected from all possible locations (a true probabilistic design), the 830 fixed sites from which they are selected are considered to be extensive enough to approximate the entire population of all possible sites. Table 3.4-1 summarizes assessment results by water quality parameter.

Table 3.4-1: Results of Statistical Assessment in Freshwater Streams

Parameter	River Miles Exceeding Criterion	Percentage of Total River Miles Exceeding Criterion	Upper and Lower 95% Confidence Intervals Percent River Miles
Total Phosphorus	2821	23	16 - 32
pH	2525	21	14 - 30
Dissolved Oxygen	1098	9	4 - 16
Temperature	805	7	3 - 13
Total Dissolved Solids	469	4	1-10
Total Suspended Solids	115	1	0 - 5
Nitrate	113	1	0 - 5
Chlorides	113	1	0 - 5
Turbidity	0	0	0 - 5
Sulfate	0	0	0 - 5

The results provided below should be considered very preliminary. The Department is working with the USEPA to improve this assessment.

Phosphorus: This assessment indicates that 16 to 32% of the freshwater, wadeable non-tidal river miles exceed the numeric criterion for total phosphorus (TP). This result is similar to the assessment made using all available data. However, as noted in the Integrated List, exceeding the numeric total phosphorus criteria may not be directly related to use attainment and use assessment should include an evaluation of the narrative criteria.

pH: This assessment indicates that 14-30% of the river miles exceed the pH criteria. As noted in the Methods Document (see Chapter - 1.2), the adopted criterion for FW2-NT waters of 6.5 to 8.5 is not appropriate for the Coastal Plain. The natural condition indicates that the pH range for these waters should be 4.5-7.5. As a result, many of the previous 303(d) listings for pH are being delisted based on the natural conditions. This assessment has not yet taken this factor into consideration.

Dissolved Oxygen and Temperature: This assessment indicates that 4 -16% of the river miles exceed the applicable Dissolved Oxygen criteria and 3 -13 % exceed the applicable temperature criteria. The number of waterbodies listed in the Appendix B (303(d) List) as not attaining designated uses because of Dissolved Oxygen and/or Temperature is significantly higher and may be due to targeted monitoring and/or the use of continuous monitoring techniques, which are more likely to capture an exceedance of the criteria.

Other Parameters: The probabilistic assessment indicates that the Total Dissolved Solids, Total Suspended Solids, Nitrate, Chloride, Turbidity, and Sulfates parameters exceed the applicable SWQS in less than 10% of the river miles. However, the number of assessment units listed in Appendix B (303(d) List) for these parameters is different and may be due to targeted monitoring.

Probabilistic Assessment of Lakes

The Department's probabilistic lake assessment is based on a selection of 200 lakes of two hectares (5 acres) or greater in surface area. This monitoring program follows the EPA recommended Generalized Random Tessellation Stratified (**GRTS**) Spatially-Balanced Survey Design. Each year, the Department selects a new panel of 40 lakes to monitor. The lake selection and monitoring protocols employed by the Department are described in the Department's 2008 Monitoring Networks Report and is available on the Department's Web site at http://www.state.nj.us/dep/wms/bfbm/lakes.html. Preliminary results for the first panel of lakes are summarized in Table 3.4-2. The first panel of 40 lakes represents a total area of 1,014 acres. Of the 40 lakes assessed, 16 lakes (46 % of total lake acres assessed) attained aquatic life use and 12 lakes (21%) did not attain aquatic life use. Due to monitoring and data problems, some of the first 40 lakes had insufficient information to assess the aquatic life. Once the entire 200 lakes are monitored and assessed, the data should provide an assessment of the condition of New Jersey's lakes and ponds.

Table 3.4-2: Preliminary Results of Probabilistic Assessment of Lakes

Assessment Results	Number of Lakes	Spatial Extent (Acres)
Attain the Use	16	464
Do Not Attain the Use	12	212

Table 3.4-3 summarizes the spatial extent of exceedance of the SWQS criteria in the 12 lakes (212 total acres) that did not attain the aquatic life use based on the three parameters used to assess aquatic life use attainment in lakes. Exceedance of the SWQS numeric criterion for total phosphorus (TP) caused more non-attainment than the other two parameters sampled (8 lakes), followed by pH exceedances (6, all Pineland lakes), and dissolved oxygen (DO) (3 lakes). However, non-attainment can be caused by more than one parameter. All lakes that exceeded the DO criterion also exceeded the TP criterion. One lake that exceeded the pH criterion also exceeded the TP criterion. Because of this, the sum of the number of lakes column does represent the total number of lakes (12) not attaining the aquatic life use and the sum of the percent of total lake acres column is greater than 100%.

Table 3.4-3: Causes of Non-attainment in New Jersey Lakes

SWQS Numeric Criteria	Number of Lakes exceeding criteria	Lake Acres exceeding criteria
Total Phosphorus	8	136
Dissolved Oxygen	3	46
pH	5	25

The Department utilizes the lake data collected from probabilistically-selected monitoring stations in conjunction with other readily available data to assess the attainment status within the assessment unit and applies that assessment to the lake acres and river miles within the assessment unit, which is presented in Appendix A. Parameters causing the non-attainment of the designated use in the assessment unit are listed in Appendix B.

Probabilistic Assessment of Estuarine Waters

During the years 2000-2006, the estuarine waters of New Jersey and other coastal states have been assessed under USEPA's National Coastal Assessment program (NCA). The Department has been a full partner in design and sampling for NCA in New Jersey's estuarine waters. The Delaware River Basin Commission has also been actively involved in the NCA program for the Delaware Estuary and the tidal portion of the Delaware River. This program has a probabilistic design that was developed by USEPA's Office of Research and Development to estimate what percentage of a state's or the nation's waters are in good, fair, or poor condition. During an index period of time each year (July through September), up to 50 locations are sampled for water quality, sediment quality, benthic community, fish assemblage, and fish pathology. USEPA has published two assessment reports based on data generated by this monitoring program. These National Coastal Condition Reports contain only limited water column data from the NCA program's once-a-year sampling; therefore, New Jersey does not fully concur with the assessment methods used in for these reports. Specifics about the probabilistic design and other aspects of NCA program can be found at USEPA's Web site at http://www.epa.gov/emap/nca/.

New Jersey is working in partnership with USEPA's Atlantic Ecology Division (AED) and USEPA Region 2's Monitoring and Assessment Program to develop additional assessment methods for New Jersey's estuarine waters. The Department, USEPA AED, USEPA Region 2, and Rutgers University are working together to develop an index, similar to the one developed by USEPA Region 2 and Rutgers University for the New York/New Jersey Harbor Estuary, for the Atlantic Coastal estuarine waters and the nearshore ocean waters in New Jersey. Sample collection for this effort began in 2007 and results will be discussed in the 2010 Integrated Report.

Chapter 4: Results of the 2008 Water Quality Assessment

This chapter explains the designated uses of the waters of New Jersey (Section 4.1) and the assessment results for each use on a statewide basis (Sections 4.2 through 4.6). These sections discuss, for each designated use, the waterbody classifications associated with the use, the methods used to assess attainment of the use, the results of the use assessment on a statewide basis, known or suspected pollutants causing non-attainment of the designated use, and potential or known sources of such pollutants. Section 4.7 explains the application of the designated use assessments in generating the principle outcome of the Integrated Report, which includes the Integrated List of Waters, the 303(d) List of Water Quality Limited Waters, and the priority ranking for TMDL development.

4.1 Designated Uses of New Jersey's Waters

USEPA's "Water Quality Standards Handbook" requires states to adopt water quality standards that "protect public health or welfare, enhance the quality of water, and serve the purposes of the federal Clean Water Act." In order to satisfy these requirements, states assign or designate "uses" to waterbodies and then promulgate criteria that are the minimum necessary to attain these uses. New Jersey's designated uses and their corresponding water body classifications are listed in the Surface Water Quality Standards at N.J.A.C. 7:9B-1.12 and 1.13. The surface water quality criteria associated with the various waterbody classifications are listed in N.J.A.C. 7:9B-1.14. (The Surface Water Quality Standards are cited in Appendix I.) The purpose of the Integrated Report is to assess the quality of the State's waters in terms of whether the designated uses are attained, based on the applicable surface water classification and criteria and, if not, to identify the specific causes of non-attainment so they can be addressed. For this purpose, the Department based its water quality assessments on seven categories of designated uses. These categories are explained briefly below. The rest of this chapter is comprised of individual sections that summarize the assessment results for each designated use, including the classifications of waters to which each use category applies. For organizational purposes, the discussion of industrial and agricultural water supply uses is combined in Section 4.5.

1. **Aquatic Life Uses** refers to the **"**maintenance, migration, and propagation of the natural and established biota." In some limited cases (i.e., waters classified as FW1), it also means "set aside for posterity to represent the natural aquatic environment and its associated biota."

2. **Recreational Use** refers to the suitability of waterbodies for recreation on or in the water. Different recreational uses are affected to different degrees by the sanitary quality of the water or aesthetic factors. <u>Primary contact recreation</u> includes those water-related recreational activities that involve significant ingestion risks and includes, but is not limited to, wading, swimming, diving, surfing, and water skiing. <u>Secondary contact recreation</u> is defined as 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, FW1, and FW2 waters. SWQS criteria have also been promulgated for secondary contact recreation in SE2 and SE3 waters. Criteria have not been promulgated for secondary contact recreation in FW1, FW2, SE1, or SC waters. Therefore, only the more stringent primary contact recreation is assessed for these waters.

3. **Drinking Water Supply Use** refers to water that is safe to ingest after conventional filtration treatment (i.e., filtration, flocculation, coagulation, and sedimentation) and disinfection.

4. **Industrial Water Supply Use** refers to water used for processing or cooling.

5. **Agricultural Water Supply Use** refers to water used for field crops, livestock, horticulture, and silviculture.

6. **Fish Consumption Use** refers to fish whose tissues do not contain excessive levels of toxic contamination and are safe for human consumption. While this use is not expressly identified in the New Jersey Surface Water Quality Standards, “fishable” waters is a goal of the federal Clean Water Act; therefore, the Department assesses the fish consumption use as part of the Integrated Report.

7. **Shellfish Harvest Use** refers to the harvest of mollusks (commonly known as clams, oysters, or mussels) that are safe for human consumption.

Use Assessment on a Subwatershed Basis

New Jersey selected the U.S. Geological Survey (USGS) Hydrologic Unit Code (HUC) 14 subwatershed boundary as the scale (i.e., assessment unit, or “AU) for assessing its waters, except for the Delaware River mainstem, Estuary, and Bay. The Department uses the 20 Delaware River Zones designated by the Delaware River Basin Commission (DRBC) to assess the Delaware River mainstem, Estuary, and Bay. The 970 AUs assessed for this report are comprised of New Jersey’s 950 HUC 14 subwatersheds and the 20 Delaware River Zones. The Department assesses the attainment of the designated uses using a suite of indicators appropriate to each, as explained in the appendix of the 2008 Methods Document (Appendix F). Some designated uses apply to all AUs (e.g., recreation); others apply to only some AUs (e.g., drinking water supply). Therefore, in assessing the percentage of uses assessed and uses attained, the total number of applicable AUs will vary. The number of AUs to which each designated use applies statewide is shown in Table 4.1-1.

Table 4.1-1: Number of Applicable Assessment Units Statewide per Designated Use

Designated Use	Number of Applicable Assessment Units (AUs)
Aquatic Life Use - General	970
Aquatic Life Use - Trout	196
Recreational Use	970
Drinking Water Supply Use	789
Agricultural Water Supply Use	789
Industrial Water Supply Use	642
Shellfish Harvest Use	169
Fish Consumption Use	970

While the Department conducted 5,495 individual designated use assessments, only 480 (49%) of the State’s AUs had sufficient data to assess all applicable designated uses (except fish consumption). One hundred and seventy-eight (18%) could be fully assessed including fish consumption. However, 914 assessment units (94%) were assessed for at least one designated use. While the 2008 method provides a more effective tool for use assessment on a watershed basis, it hinders a direct comparison between 2008 results and 2006 results, since the 2006 Integrated Report assessed certain designated uses (e.g., drinking water) separately for AUs and lakes.

Identifying Sources of Non-Attainment/Impairment

The primary focus of Section 305(b) reporting is the evaluation of existing data and information to assess the overall "health" of waters of the state and to determine the status of use attainment. The primary focus of 303(d) reporting is identifying impaired waters and pollutants causing impairments that require TMDLs. The Integrated Report focuses on both use attainment and impairment and their respective causes and sources.

The Department does not generally have access to data that verifies the source or cause of use non-attainment. Therefore, the Department has developed a method for identifying the following list of **potential sources** of specific pollutants using the New Jersey Geographic Information System (GIS) as an analytical tool.

- Major Municipal Point Sources
- Industrial Point Sources
- Package Treatment Plants
- Combined Sewer Overflows
- On-Site Wastewater Treatment Systems
- Agricultural Land Use
- Urban Land Use
- Upstream Impoundments
- Atmospheric Deposition
- Natural Sources

The Department used the following publicly available GIS data layers, which can be downloaded from http://www.nj.gov/dep/gis/. The limitations and accuracy of the available data is listed in the GIS Metadata.

- NJPDES Permitted Surface Water Discharges
- 1995/97 Land Use/Land Cover
- Lakes (Open Water Areas)

The first five potential sources were taken from the NJPDES point source coverage. The Department used "DISTYPE" to select Major Municipal Point Sources (MMJ), Major Industrial Point Sources (MMI), package treatment plants including minor municipals (municipal wastewater discharges of less than 1 million gallons per day and minor industrial facilities that discharge wastewater to waters of the state), and Combined Sewer Overflows (CSO). The NJPDES point source coverage was also used to identify on-site wastewater treatment plants (Discharges to Groundwater >2000 gallons per day).

Both Agriculture and Urban Land Uses were taken from the 1995/97 Land Use/Land Cover coverage and filtered once for agriculture only and a second time for urban only. If any portion of land within the assessed subwatershed contained agricultural land and/or urban land, the appropriate potential source was listed. This coverage has since been replaced with the 2002 Land Use/Land Cover dataset, which is based on photography captured in Spring 2002. However, since the 2002 coverage was released for general distribution as a preliminary product only and is not legally binding, the Department did not use this version to determine potential sources. The Department does not expect the land use changes that have occurred since 1995 and are reflected in the 2002 updated coverage to substantially alter the number of assessment units impacted by Agriculture and/or Urban Land Use.

Upstream Impoundments were identified as a potential source in all assessment units where temperature was identified as a pollutant causing non-attainment. Atmospheric deposition was listed as a potential source in all assessment units where mercury was identified as a pollutant causing non-attainment. Natural Sources, Industrial Point Sources, and former Agricultural Land Uses were identified as potential sources in all assessment units where arsenic was identified as a pollutant causing non-attainment.

The process used to identify pollutants and sources that potentially impact a designated use was developed based on best professional judgment. The data layer for each source was overlain with each of the designated uses for which it could be a potential source. If the source location overlapped with a non-attained designated use, the source was identified as a potential source of non-attainment for that use.

This analysis has been used to identify potential sources of non-attainment within an assessment unit. No effort has been made to verify whether or not the source actually affects the assessment unit or to what degree. Verification of actual sources of pollutants causing non-attainment will occur through the TMDL process (see Chapter 5, Section 5.6 for a description of the TMDL Program).

Chapter 4: Results of the 2008 Water Quality Assessment

4.2 Aquatic Life Uses

The following definition of the aquatic life designated use assessed in this report is based on use classifications established in the New Jersey Surface Water Quality Standards at N. J. A. C. 7:9B. For this report, "Aquatic Life Uses" of surface waters means any of the following:

1. Set aside for posterity to represent the natural aquatic environment and its associated biota (for FW1 waters of the State);
2. Maintenance, migration, and propagation of the natural and established biota (for FW2, SE1, SE2, and SC waters); and
3. Maintenance and migration of fish populations, migration of diadromous fish, and maintenance of wildlife (for SE3 waters).

For assessment purposes, these aquatic life uses are grouped into two categories. The first category is a general level of support, which is applied to all waters. The second category applies exclusively to waterbodies classified for Trout Production and Trout Maintenance. (Note: Lakes are no longer assessed separately for aquatic life use attainment. For this report, lakes were assessed as data points for their respective assessment units, as explained in Appendix F: Methods Document, Section 1.2.)

General Aquatic Life Use

Assessment Method

The aquatic life use is assessed by directly and indirectly evaluating biotic communities and assessing the health of the aquatic biota. When such data are available, the Department bases its aquatic life use assessments upon metrics developed to assess benthic macroinvertebrate data, in conjunction with fin fish IBI (Index of Biotic Integrity) data, and supplemented with a broad suite of biologically relevant physical/chemical data (e.g., dissolved oxygen, temperature, toxic pollutants). The 2008 Integrated Report uses the results of three new biological assessment metrics based upon benthic macroinvertebrate data. Of note is a new benthic index for the Pinelands region, which is used in conjunction with biological data collected by the Pinelands Commission (see Appendix F: Methods Document, Section 4.3).

When biological data are not available, the Department must rely on biologically-relevant chemical water quality data alone, such as dissolved oxygen (DO), to indirectly assess the health of the biota, even though chemical water quality data provide only a "snapshot" in time rather than the longer-term assessment supported by biological indicators. (See Appendix F: Methods Document, Section 6.1 for a more detailed discussion of aquatic life use assessment methods.)

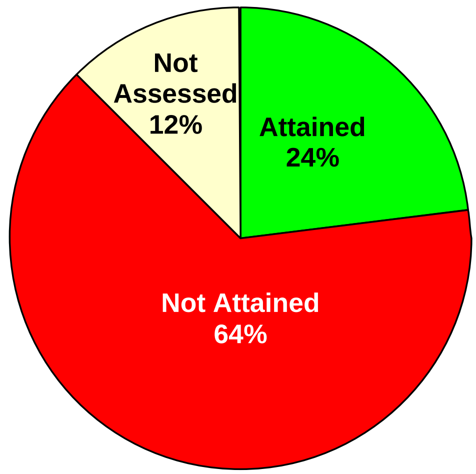
Assessment Results

Assessment results for general aquatic life uses are summarized in Table 4.2-1 and Figure 4.2-1. The aquatic life use applies to all 970 assessment units (AUs) in New Jersey. Of these, 24% attained the use, 64% did not attain the use, and 12% were not assessed. Of the 853 AUs assessed for general aquatic life, 27% attained the use, and 73% did not. This represents a slight increase in both attainment and non-attainment compared to 2006.

Table 4.2-1: Assessment Results for General Aquatic Life Use – Statewide Percentages

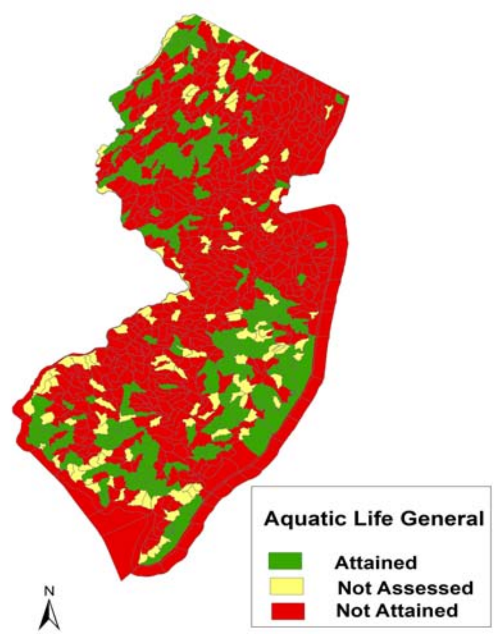
Aquatic Life	# of AUs	% of AUs Assessed	% of Total AUs
Attained	230	**27**	**24**
Not Attained	623	73	**64**
Not Assessed	117		**12**
Total Assessed	853		88
Total Applicable AUs	970		

Figure 4.2-1: Assessment Results for General Aquatic Life Use - Statewide Percentages



The number of AUs not attaining the general aquatic life use and listed on the 2008 303(d) List of Water Quality Limited Waters increased from 572 in 2006 to 623 in 2008. One reason for these new listings is the use of new metrics for assessing biological monitoring data. The new metrics for benthic macroinvertebrates allowed the Department to assess previously unassessed biological data, mostly in AUs with small catchment areas and in the Pinelands region. Twenty-nine benthic monitoring sites assessed in 2006 as not impaired were assessed in 2008 as impaired, which resulted in assessment of the corresponding AUs as not attaining the aquatic life use. Enhancements to the Fish Index of Biological Integrity (FIBI) metric also changed the assessment results for eleven FIBI monitoring stations from not impaired in 2006 to impaired in 2008, causing those corresponding assessment

Figure 4.2-2: Assessment Results for General Aquatic Life Use, Statewide Spatial Extent



units to be assessed as not attaining the aquatic life use. Some of the assessment units newly listed as not attaining the aquatic life use in 2008 were due to new data indicating exceedances of dissolved oxygen, phosphorus, and/or pH. AUs not attaining the general aquatic life use are distributed throughout the State (see Figure 4.2-2). Conversely, 57 AUs assessed in 2006 as not attaining the general aquatic life use were assessed as attaining the use in 2008 (50 AUs on Sublist 2 and 7 on Sublist 1) and were delisted from the 303(d) List of Water Quality Limited Waters. Some of these delistings were attributable to improved metrics that indicated use attainment in waters previously assessed as impaired. Twenty-seven AUs previously listed solely for exceedances of pH criteria in 2006 were delisted because the pH levels were determined to reflect natural conditions in Coastal Plain waters (see Appendix F: Methods Document, Section 1.2 "Naturally low pH").

None of the assessment units in New Jersey's ocean waters attained aquatic life uses. This is generally due to a region containing low dissolved oxygen (DO) that forms off the coast on the ocean bottom during the summer months when the waters stratify and breaks up in the fall. This region of low DO in New Jersey extends from Sandy Hook south to the Wildwoods. This benthic low DO cell is discussed further in the next section, "Parameters Causing Non-Attainment."

Parameters Causing Non-Attainment

A specific pollutant(s) was identified on the 2008 303(d) List for 70% of the 595 AUs that did not attain the general aquatic life use (Note: this figure does not include AUs assigned to Sublist 4, which does not identify the cause of non-attainment). The cause of non-attainment for the remaining 30% was listed as "cause unknown" since the assessment was based on biological data indicating impairment; no chemical data was available for these assessment units (see Appendix B: 2008 303(d) List.)

Conventional Parameters

The parameters most closely associated with attainment of the aquatic life use are conventional parameters such as total phosphorus (TP), pH, temperature, turbidity, total suspended solids (TSS), total dissolved solids (TDS), and un-ionized ammonia. The total number of AUs listed in the following tables is based upon applicability of the numeric criteria. For example, the TP criterion does not apply to SE or SC waters; therefore, the number of AUs in Table 4.2-3 is less than 970.

Of the AUs not attaining the general aquatic life use because of a specific pollutant, the cause was most often attributed to exceedance of the TP or pH criteria. Temperature was also a notable cause of impairment, but was mostly associated with trout production or trout maintenance non-attainment, which is discussed in more detail later in this section (see "Aquatic Life Use - Trout"). Exceedances of TDS, TSS, and turbidity were also identified as causes but to a much lesser degree than the other parameters. Exceedances of dissolved oxygen (DO) criteria were also identified as a cause of non-attainment for coastal AUs. Un-ionized ammonia levels were found to exceed criteria in the lower Passaic and lower Hackensack River Watersheds based on assessment of data submitted by the Passaic Dischargers Group in response to the Department's data solicitation notice (see Chapter 8: Public Participation). This was the first time data was available to evaluate compliance with the un-ionized ammonia criteria since it was adopted in 2001. The following explains the assessment results for these pollutants (total phosphorus, pH, temperature, dissolved oxygen, total dissolved solids, and total suspended solids) in terms of conformance with the applicable criteria.

Total phosphorus: Numeric criteria for total phosphorus (TP) were met in 50% of the AUs where the criteria apply (786). Eighteen percent (18%) exceeded criteria, and 32% had insufficient information. AUs not meeting TP criteria were concentrated in the more urbanized areas of the State, namely the Piedmont and Inner Coastal Plain (see Table 4.2-3 and Figures 4.2-4 and 4.2-5).

Table 4.2-3: Exceedance of General Aquatic Life Criteria for Total Phosphorus (TP), Statewide Percentages

Total Phosphorus	# of AUs	% of Assessed AUs	% of Total AUs
Meets Criteria	388	**73**	**50**
Exceeds Criteria	143	27	**18**
Insufficient Data	255		**32**
Total Assessed	531		68
Total # of AUs	786		

Figure 4.2-4: Exceedance of General Aquatic Life Criteria for TP, Statewide Percentages

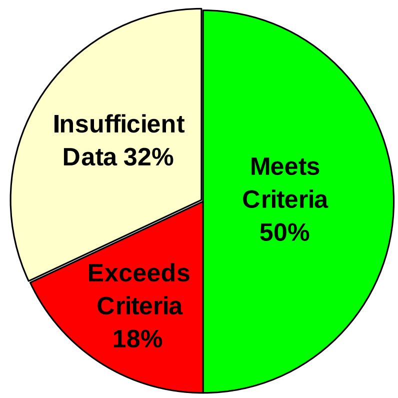
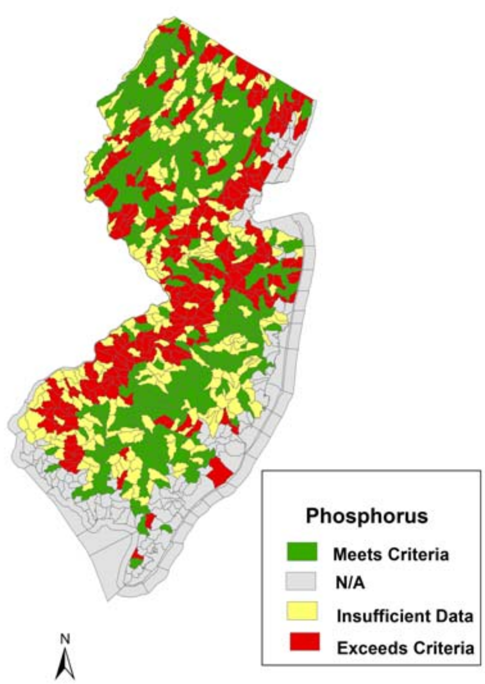


Figure 4.2.5: Exceedance of General Aquatic Life Criteria for TP, Statewide Spatial Extent



pH: The Department determined that the current pH criteria applicable to FW2 waters in the Coastal Plain do not reflect the naturally-occurring low pH conditions. Based on a new assessment method that accounts for naturally low pH in these waters, 46% of applicable AUs met the pH criteria, 13% exceeded criteria, and 41% had insufficient information (see Table 4.2-4 and Figures 4.2-6 and 4.2-7). While these assessments resulted in delisting pH in 103 AUs in 2008, 31 AUs will be added to the 303(d) List of Water Quality Limited Waters and many will remain on the 303(d) List for persistent exceedances of the pH criteria.

Table 4.2-4: Exceedance of General Aquatic Life Criteria for pH, Statewide Percentages

pH	# of AUs	% of Assessed AUs	% of Total AUs
Meets Criteria	449	**79**	**46**
Exceeds Criteria	121	21	**13**
Insufficient Data	400		**41**
Total Assessed	570		59
Total # of AUs	970		

Figure 4.2-6: Exceedance of General Aquatic Life Criteria for pH, Statewide Percentages

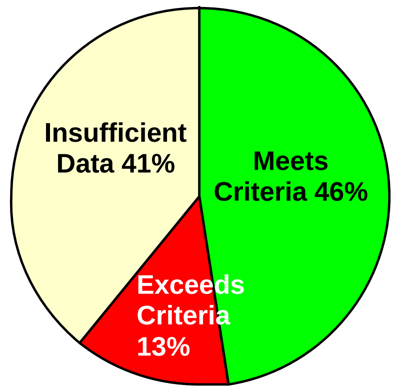
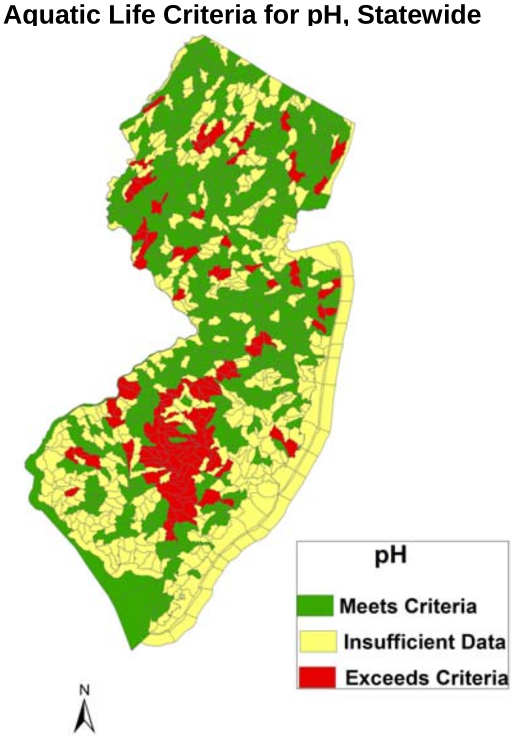


Figure 4.2-7: Exceedance of General Aquatic Life Criteria for pH, Statewide



Temperature: Over half (52%) of all applicable AUs met criteria, 8% exceeded criteria, and 40% had insufficient information. A majority of the exceedances were located in trout waters and resulted in a significant number of these waters (classified as Trout Production and Trout Maintenance) not attaining the Trout Aquatic Life Use (see discussion on "Aquatic Life Use-Trout" later in this section). Assessment results for temperature are depicted in Table 4.2-5 and Figures 4.2-8 and 4.2-9.

Table 4.2-5: Exceedance of General Aquatic Criteria for Temperature, Statewide Percentages

Temperature	# of AUs	% of Assessed AUs	% of Total AUs
Meets Criteria	485	**85%**	**52%**
Exceeds Criteria	69	12%	**7%**
Insufficient Data	377		**41%**
Total Assessed	554		60%
Total # of AUs	931		

Figure 4.2-8: Exceedance of General Aquatic Criteria for Temperature, Statewide Percentages

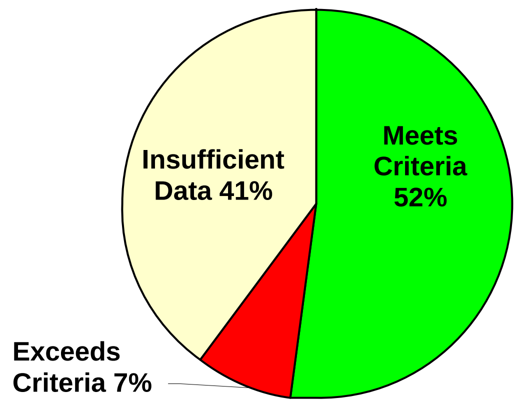
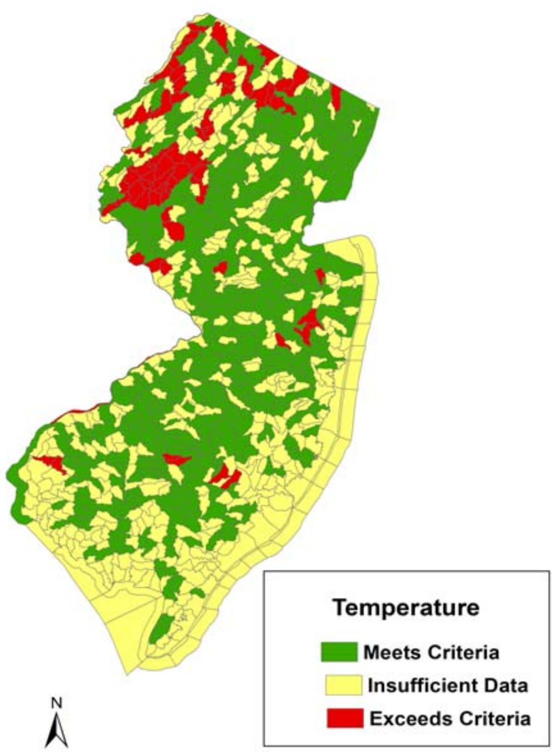


Figure 4.2-9: Exceedance of General Aquatic Life Criteria for Temperature, Statewide Spatial Extent



Total suspended solids: Total suspended solids (TSS) caused the smallest number of exceedances (46) among the pollutants causing non-attainment of the general aquatic life use. Half (50%) of all applicable AUs met the TSS criteria, 6% of exceeded criteria, and 44% had insufficient information (see Table 4.2-6 and Figures 4.2-10 and 4.2-11).

Table 4.2-6: Exceedance of General Aquatic Life Criteria for Total Suspended Solids (TSS), Statewide Percentages

TSS	# of AUs	% of Assessed AUs	% of Total AUs
Meets Criteria	393	**89%**	**50%**
Exceeds Criteria	46	11%	**6%**
Insufficient Data	347		**44%**
Total Assessed	439		56%
Total # of AUs	786		

Figure 4.2-10: Exceedance of General Aquatic Life Criteria for TSS, Statewide Percentages

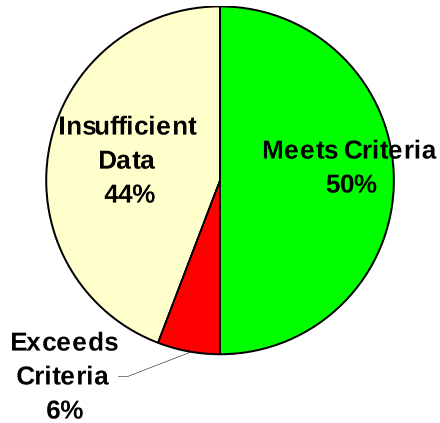
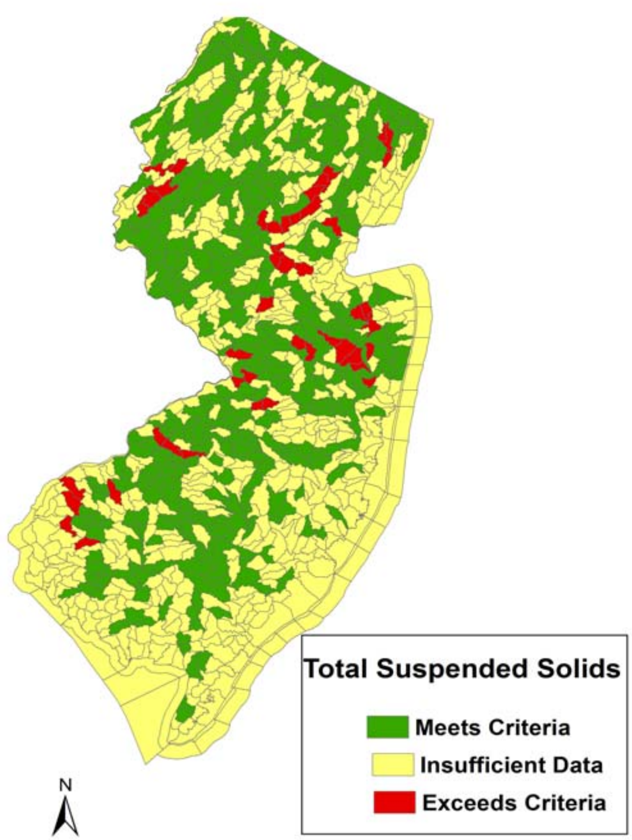


Figure 4.2-11: Exceedance of General Aquatic Life Criteria for TSS, Statewide



Dissolved oxygen: Fifteen percent (15%) of applicable AUs (freshwater and coastal) exhibited exceedances of the dissolved oxygen (DO) criteria; however, this is largely a coastal issue, as shown in Figures 4.2-13. A region containing low DO forms off the Coast on the ocean bottom during the summer months, when the waters stratify, and breaks up in the fall. In New Jersey, this region of low DO extends from Sandy Hook south to the Wildwoods. The reason for the benthic low DO cell is not known, although summer algal bloom die-off has been implicated by some investigators. The impacts on benthic marine biota are unclear as well. Despite this phenomenon, almost 50% of applicable AUs met DO criteria for aquatic life. Forty percent (40%) had insufficient information to assess conformance with the criteria (see Table 4.2-7 and Figure 4.2-12). **It is important to note that surface DO levels have historically met applicable criteria**.

Table 4.2-7: Exceedance of General Aquatic Life Criteria for Dissolved Oxygen (DO), Statewide Percentages

DO	# of AUs	% of Assessed AUs	% of Total AUs
Meets Criteria	438	**76%**	**45%**
Exceeds Criteria	141	**24%**	**15%**
Insufficient Data	391		**40%**
Total Assessed	579		60%
Total # of AUs	970		

Figure 4.2-12: Exceedance of General Aquatic Life Criteria For DO, Statewide Percentages

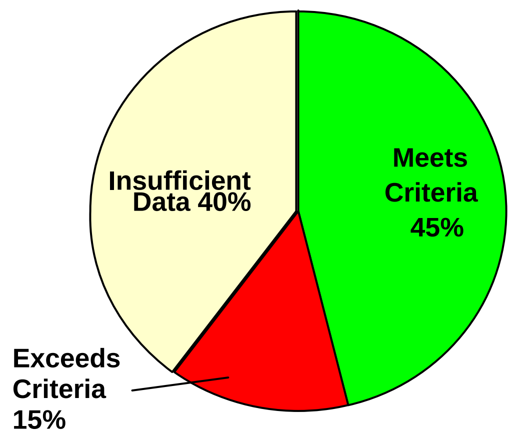
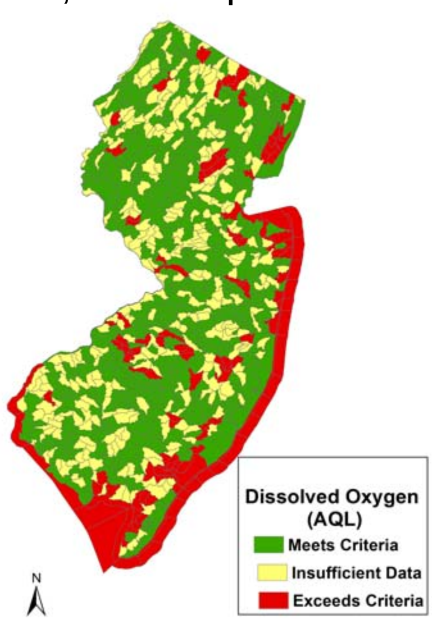


Figure 4.2-13: Exceedance of General Aquatic Life Criteria for DO, Statewide Spatial Extent



Metals

The following suite of metals is also relevant to aquatic life use attainment: cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc. However, data for each of these metals is not <u>essential</u> to assess aquatic life use attainment (see Appendix F: Methods Document, Section 6.1). Where metals data are available, exceedances of the applicable SWQS criteria are evaluated as part of the aquatic life use assessment. Table 4.2-8 shows the relative number of exceedances (statewide) of the general aquatic life criterion for each metal sampled.

Table 4.2-8: Exceedances of General Aquatic Life Criteria for Metals, Statewide

Metal	# AUs Assessed	# AUs Exceeding Criteria
Copper	296	36
Mercury	294	27
Lead	283	17
Chromium	235	18
Cadmium	152	9
Zinc	205	5
Nickel	305	4
Silver	35	1
Thallium	22	1
Selenium	271	0

The criteria for cadmium, chromium, copper, nickel, and zinc are hardness-dependant. Therefore, data for hardness are required, along with metals data, to evaluate whether the aquatic life criteria for metals are exceeded. This also means that relatively low environmental levels of these metals can cause exceedances of the metals criteria in waters with low pH and hardness, such as the Pinelands and surrounding area. (Note: The SWQS contain both human health and aquatic life criteria for metals. The aquatic life use assessment considers exceedances only of the aquatic life criteria for metals.)

Sources of Parameters Causing Non-Attainment

As explained in Section 4.1, sources of parameters (including the pollutants described above as well as “cause unknown”) causing non-attainment of the general aquatic life use were identified through the use of Geographic Information Systems (GIS) computer technology. Based solely on whether or not a specific land use was present in each of the aquatic life use assessment units, urban runoff and agricultural land uses were the most predominant potential sources of the parameters causing non-attainment. In other words, of all the AUs not attaining the general aquatic life use, there were more land uses associated with urban runoff and agriculture than any of the other potential sources considered. The second most common category of potential sources of pollutants causing non-attainment of the aquatic life use was point sources such as package treatment plants and municipal point sources of wastewater. Onsite wastewater treatment systems (small wastewater treatment plants that discharge to ground water in amounts greater than 2000 gal/day) represent the third most common category.

Actions Taken To Date

- Fourteen AUs were delisted based on TMDLs approved for phosphorus.

- The Department is completing a pilot program to identify the full suite of stressors that may cause biological impairment on a site-specific basis. The Stressor Identification (SI) process evolved from a USEPA initiative that was modified by the Department to better reflect New Jersey's assessment experience. The pilot study assessed four biologically-impaired sites located in Drakes, Holland, and Beaver Brooks, all tributaries to the South Branch Raritan River. Field work for the pilot study is completed and a report is being drafted. Upon completion of the project, a larger-scale effort will begin in coordination with stream restoration projects funded under the Department's 319(h) Nonpoint Source Pollution Control Grant Program (see Chapter 5, Section 5.5). In the meantime, the Department will continue to identify "cause unknown" as the cause of non-attainment where assessment results are based solely on biological impairment.

Actions Planned

- A total of 64 TMDLs are planned for completion within the next two years for parameters associated with aquatic life use attainment (see Appendix D for the Two-Year TMDL Schedule). These include 49 TMDLs for total phosphorus, seven for total suspended solids, three for pH, two each for dissolved oxygen and un-ionized ammonia, and one for temperature.

- The Department's Fish Index of Biotic Integrity (IBI) metric for the inner Coastal Plain of southern New Jersey is targeted for completion and use by the fall of 2009.

- The Department's Stressor Identification (SI) program is designed to identify the pollutants that are causing biological impairment at benthic macroinvertebrate monitoring sites (see Chapter 9 for more details). The Department is committed to investigating six impaired sites in FY 2009.

- The Department will continue to expand the number of waterways assessed using continuous monitoring data for DO and temperature. In contrast to discrete monitoring performed in the past for these as well as other parameters, continuous monitoring is more likely to capture exceedances of water quality criteria that occur during the most stressful period within a 24-hour cycle (see Chapter 9 for more details).

- The Department continues to provide Section 319(h) Nonpoint Source Pollution Control grant funds to projects to restore aquatic life uses. A list of the 319(h) grant projects funded between 2004 and 2006 is provided in Appendix K. New projects under review include watershed restoration projects in Clove Acres Lake, Papakating Creek, portions of the Neshanic River Watershed, and locations in Locatcong and Wichecheote Creeks.

- The Department is developing a benthic biological indicator to enhance assessment of the general aquatic life use in coastal waters (see Chapter 9: Next Steps).

Trout Aquatic Life Use

As discussed at the beginning of this section, the second category of aquatic life uses applies exclusively to freshwater waterbodies classified for one of two trout uses:

1. Trout production: Waters designated at N.J.A.C. 7:9B-1.15(b) through (g) for use by trout for spawning or nursery purposes during their first summer.

2. Trout maintenance waters: Waters designated at N.J.A.C. 7:9B-1.15(b) through (g) for the support of trout throughout the year.

The Trout Use classification is generally regarded as more restrictive than the General Aquatic Life Use.

Assessment Method for Trout Aquatic Life Use

As shown in Figure 4.2-15, AUs containing waters classified for trout uses are concentrated primarily in the northwest portion of the State. Detailed information regarding the assessment methodology for the Aquatic Life Use-Trout is located in Appendix F: Methods Document, Chapter 5, under “Additional Considerations When Combining Data from Multiple Stations within an Assessment Unit.” Before conducting an assessment for this use, an assessment is first conducted for the general aquatic life use, based on biological data (see Appendix F: Methods Document, Section 4.3). The temperature and DO profile are then assessed using the surface water quality criteria for trout waters. The Department adopted a new temperature criterion for trout production waters in October 2006 and clarified that the criteria should be implemented as a summer seasonal average. The methodology for assessing compliance with the temperature criterion is explained in Appendix F: Methods Document, Section 4.1 under “Continuous Monitoring – Temperature.”

Assessment Results

Assessment results for the Trout Aquatic Life Use are summarized in Table 4.2-9 and Figures 4.2-14 and 4.2-15. There are 196 assessment units that contain waters classified for the Trout Aquatic Life Use (i.e., Trout Production or Trout Maintenance Waters). Of these, 21% attained the use, 63% did not attain the use, and 16% were not assessed. Of the 164 (86%) of AUs assessed for trout aquatic life, 26% attained the use and 74% did not.

Table 4.2-9: Assessment Results for Trout Aquatic Life Use, Statewide Percentages:

Aquatic Life - Trout	# AUs	% of AUs Assessed	% of Total AUs
Attained	42	**26**	**21**
Not Attained	122	74	**63**
Not Assessed	32		**16**
Total Assessed	164		84
Total Applicable AUs	196		

Figure 4.2-14: Assessment Results for Trout Aquatic Life Use – Statewide Percentages

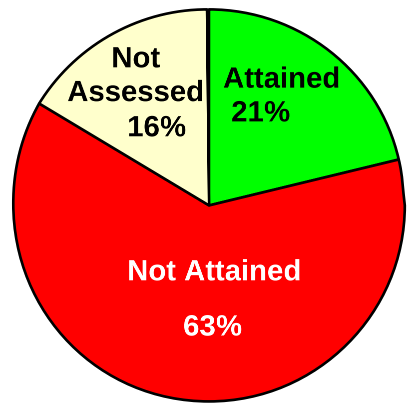
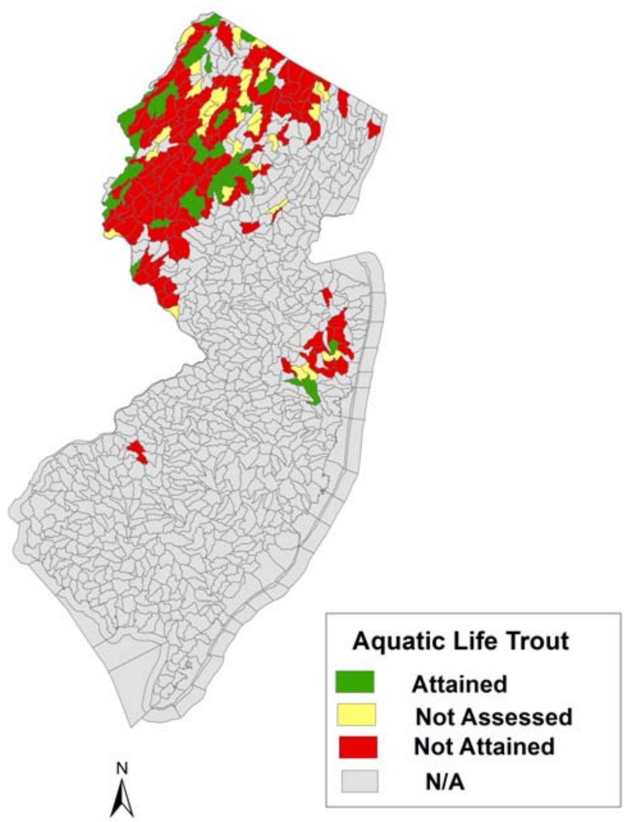


Figure 4.2-15: Assessment Results for Trout Aquatic Life Use, Statewide-Spatial Extent



Parameters Causing Non-Attainment of the Trout Aquatic Life Use

Exceedances of the temperature and biological criteria are responsible for the vast majority of AUs not attaining the trout aquatic life use. A much smaller percentage of AUs did not attain the use because of DO exceedances. In summary, of the 122 AUs not meeting the trout aquatic life use, 63 are listed for temperature exceedances and 5 are listed for DO. In 49 AUs, the parameter causing non-attainment was listed as “cause unknown” because biological data showed impairment but no physical or chemical data was available.

Since higher temperatures cause lower DO levels in the water column, additional sampling for DO may show more widespread exceedances of DO criteria for aquatic life. The Department continues to collect diurnal DO data throughout the State but limited resources preclude sampling in all AUs. However, future selection of diurnal sampling locations will take into consideration high temperature and the ramifications it has on trout waters.

Sources of Parameters Causing Non-Attainment

The potential sources of parameters (including the pollutants described above as well as “cause unknown”) causing non-attainment of the trout aquatic life use were identified through the use of Geographic Information Systems (GIS) computer technology (see “Identifying Sources of Impairment” in Section 4.1 for a detailed explanation of assessment procedure). Based solely on whether or not a specific land use was present in each of the AUs designated for trout aquatic life use, urban runoff and agricultural land uses were the most predominant potential sources of the parameters causing non-attainment. In other words, of all the AUs not attaining the trout aquatic life use, there were more land uses associated with urban runoff and agriculture than any of the other potential sources considered. The second most common potential sources were upstream impoundments and package plants. Note that runoff from urban surfaces and impoundments are both known to contribute to the warming of receiving waters.

Actions Taken To Date and Actions Planned

- Same as for General Aquatic Life (above).

Chapter 4: Results of the 2008 Water Quality Assessment

4.3 Recreational Uses

The recreational use of waters of the State is derived from the original goal of the federal Clean Water Act that all waters be "fishable" and "swimmable." The surface water quality criteria used to determine if waters are "swimmable" are health-based, since swimming involves direct contact with, and potential ingestion of, pollutants in the water that can affect human health. Of primary concern among these pollutants is the ingestion of pathogens that can cause illness and even death. Because of the serious health concerns associated with this use, recreational use is assessed based on two subcategories: primary contact and secondary contact.

Primary contact recreation includes 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 recreational activities where the probability of water ingestion is minimal and includes, but is not limited to, boating and fishing. Surface water quality criteria have been promulgated for primary contact recreation in SC, SE1, and FW2 waters and for secondary contact recreation in SE2 and SE3 waters. Since surface water quality criteria have not been promulgated for secondary contact recreation in FW1, FW2, SE1, or SC waters, only the more stringent primary contact recreational use is assessed for these waters. (The surface water quality criteria for FW2 waters are used to assess primary contact recreation in FW1 and PL waters.)

Assessment Method

As explained above, all waters designated as FW, PL, SE1, and SC are assessed for primary contact recreation; SE2 and SE3 waters are assessed for secondary contact recreation. Assessment of the recreational use compares the geometric mean (geomean) of the water quality data for pathogenic indicators to the surface water quality criterion applicable to the waterbody classification. If the geomean is greater than the numeric criterion for the pathogenic indicator applicable to the classification, then the AU is assessed as not attaining the recreational use. Primary contact recreation is also assessed using beach closure data for designated bathing beaches. If beach closure data indicate that a designated bathing beach is impaired, the recreational use is assessed as not attained, except where the impairment is determined to be *de minimus*. (See Appendix F: Methods Document, Section 4.2 "Pathogenic Indicators" and Section 6.2 for details regarding assessment of the recreational use.) The assessment results for primary and secondary contact recreation were combined to provide an overall assessment of recreational use attainment.

Assessment Results

Assessment results for recreational uses are summarized in Table 4.3-1 and Figure 4.3-1. Recreational uses apply to all 970 AUs in New Jersey. Of these, 19% attained the use, 41% did not attain the use, and 40% were not assessed. Of the 587 (60%) assessed AUs, 32% attained the use and 68% did not. Primary recreation (i.e., swimming) applies to 948 AUs, including 38 AUs containing ocean waters, which experience the most intensive recreational use of all the State's waters. However, the State's ocean beaches from Sandy Hook to Cape May Point are fully swimmable, i.e., they attain the primary contact recreational use (see Figure 4.3-2), with the exception of a 250-yard span across four beaches at the Spring Lake/Sea Girt border in Monmouth County, Brown Avenue, York Avenue, Beacon, and Terrace beaches. This span of ocean beaches is particularly affected by the impact of excessive rainfall on discharge from Wreck Pond. Since 2002, a precautionary beach closing plan has been implemented requiring that the bathing areas of these beaches north and south of the Wreck Pond outfall are automatically closed for 24 hours after the end of all rainfalls greater than 0.1 inch; for 48 hours from the end of all rainfalls greater than 2.8 inches within a 24-hour period; or for any visible discharge from the Wreck Pond ocean outfall.

Table 4.3-1: Assessment Results for Recreational Uses, Statewide Percentages

Recreation	# AUs	% of AUs Assessed	% of Total AUs
Attained	187	**32**	**19**
Not Attained	400	68	**41**
Not Assessed	383		**40**
Total Assessed	587		60
Total Applicable AUs	970		

Figure 4.3-1: Assessment Results for Recreational Uses, Statewide Percentages

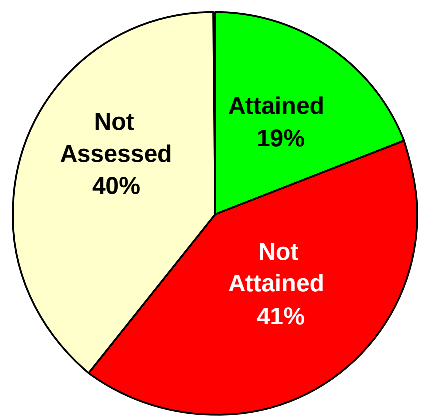
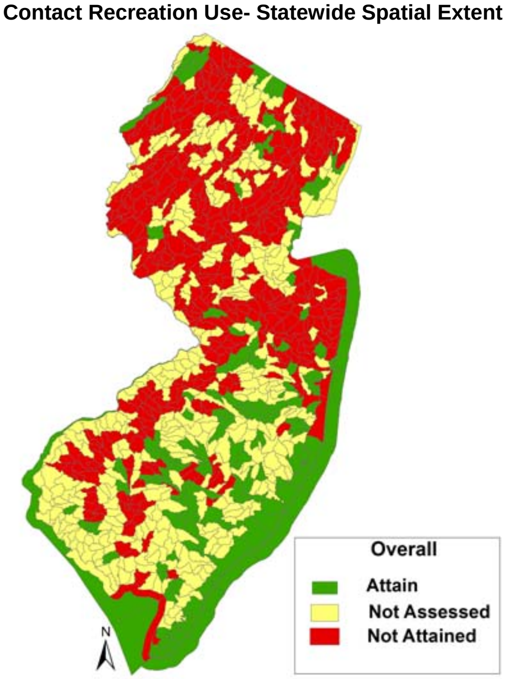


Figure 4.3.2: Assessment Results for Primary Contact Recreation Use- Statewide Spatial Extent



Parameters Causing Non-Attainment

Attainment of recreational uses (primary and secondary) was assessed with a suite of bacterial indicators of pathogens. In the past, fecal coliform bacteria was the principal pathogenic indicator used to assess recreational uses but was replaced by *Escherichia coli* (*E. coli*) in freshwaters and enterocci in coastal waters (see Appendix F: Methods Document, Section 4.2 for details regarding assessment using pathogenic indicators). The switch to *E. coli* and enterocci did not affect the outcome of the recreational use assessment; 68% of AUs assessed in 2008 using *E. coli* and enterocci did not attain the recreational use. The same percentage (68%) of non-attainment was found in 2006 using fecal coliform.

Sources of Parameters Causing Non-Attainment

Sources of pathogens to freshwaters are generally nonpoint in nature and include stormwater runoff from urban and suburban surfaces, Canada geese and other wildlife, failing septic systems, livestock holding areas, and pet waste (conducted through stormwater conveyances). Illicit cross connections between sanitary and storm sewer lines and interconnections caused by leaking sanitary sewer lines and failing septic systems within, or in close proximity to, stormwater lines may also contribute pathogens to receiving waters (see Chapter 5, Section 5.5 for more information on nonpoint sources of pollution). Combined sewer overflows (CSOs) are wet weather pathogen sources but are predominantly located in the New York/New Jersey Harbor and the Delaware River Estuary Complexes (see Chapter 5, Section 5.4 for more information on CSOs). Sources of pathogens found in coastal bathing and shellfish waters include many of the same sources that plague freshwater systems. These include stormwater inputs; wildlife, including waterfowl and sea gulls; illicit cross-connections between sanitary and storm sewer lines, leaking sanitary sewer lines and CSOs.

The potential sources of parameters causing non-attainment of recreational uses were identified through the use of Geographic Information Systems (GIS) computer technology (see "Identifying Sources of Impairment" in Section 4.1 for a detailed explanation of assessment procedure). Based on this methodology**,** urban runoff and agriculture were associated with the largest number of assessment units not attaining recreational uses. Note that although CSOs are associated with a limited number of AUs that did not attain recreational uses, they are a source of pathogens that need to be addressed on a regional basis.

Actions Taken

- Ten AUs were delisted from the 303(d) List as a result of completed fecal coliform/*E. coli* TMDLs. The Department issued NJPDES general stormwater permits that regulate all 566 municipalities in New Jersey (see Section 5.4, "Municipal Stormwater Regulation Program" for more information).

Actions Planned

- A total of 6 pathogen TMDLs are scheduled for completion within the next 2 years.

Chapter 4: Results of the 2006 Water Quality Assessment

4.4. Drinking Water Supply Designated Use

The drinking water supply use is defined as waters that are potable (safe to ingest) after conventional filtration treatment (a series of processes including filtration, flocculation, coagulation, and sedimentation, resulting in substantial particulate removal but no consistent removal of chemical constituents) and disinfection. All FW2 and PL waters in New Jersey are classified for potable water supply use. It is important to note that many waterbodies do not have drinking water intakes due to stream size and other considerations.

Assessment methods

The core parameters used to assess the drinking water supply use are nitrate, total dissolved solids (TDS), chloride, and a suite of heavy metals and other toxic substances. In addition to these constituents, the Department also uses monitoring data from finished water supplies to determine compliance with the federal Safe Drinking Water Act's National Primary Drinking Water Regulations (NPDWRs, or primary standards) and any data delineating source water restrictions if and when available. See the Methods Document (Appendix F, Section 6.5) for a more detailed discussion of assessment methods for the drinking water supply use.

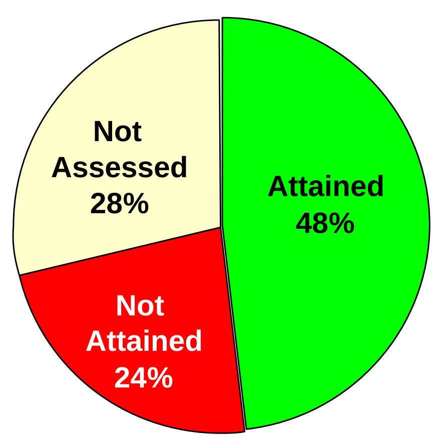
Assessment Results

Results are summarized in Table 4.4-1 and Figure 4.4-1. There are 789 AUs in New Jersey where the drinking water supply use applies. Of these, 48% attained the use, 24% did not attain the use, and 28% were not assessed. Of the 567 (72%) AUs assessed, 67% attained the use, and 33% did not.

Table 4.4-1: Assessment Results for Drinking Water Supply Use, Statewide Percentages

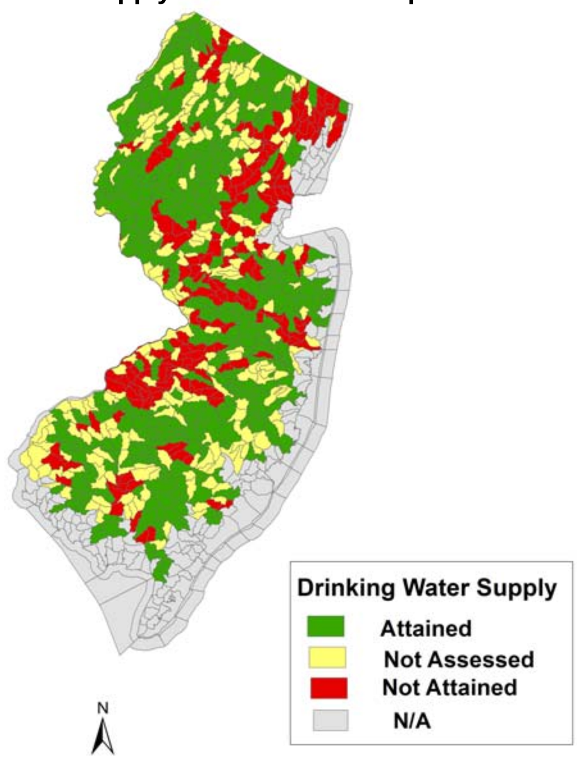
Drinking Water Supply	# AUs	% of AUs Assessed	% of Total AUs
Attained	380	**67**	**48**
Not Attained	187	33	**24**
Not Assessed	222		**28**
Total Assessed	567		72
Total Applicable AUs	789		

Figure 4.4-1: Assessment Results for Drinking Water Supply Use, Statewide Percentages



Spatial representation of drinking water supply use attainment is presented in Figure 4.4-2. With some exceptions, regions of non-attainment are mostly located in the Piedmont and portions of the Inner Coastal Plain physiographic provinces.

Figure 4.4-2: Assessment Results for Drinking Water Supply Use – Statewide Spatial Extent



Parameters Causing Non-Attainment

Of the 187 AUs not attaining the drinking water supply use, the leading pollutants identified as causing non-attainment included arsenic, lead, mercury, nitrate, and total dissolved solids (TDS). It should be noted that, in some AUs, non-attainment may have been caused by more than one of these pollutants, and certain AUs were assessed for some but not all drinking water pollutants.

Arsenic

The drinking water supply use assessment reflects potential rather than actual use for potable supplies. All freshwaters (789 AUs) in New Jersey are designated for the drinking water supply use; however, only a few are actually used for that purpose. A total of 148 AUs were placed on the 2008 303(d) List as not attaining the drinking water use due to exceedances of the 0.017 *u*g/l human health criterion for arsenic. Six other AUs also exceed the arsenic criterion, but were assigned to Sublist 4 of the Integrated List of Waters because TMDLs were already adopted for these waters. The Department's Safe Drinking Water Program in the Division of Water Supply has established a Maximum Concentration Level (MCL) of 5 *u*g/l for arsenic in finished drinking waters. Only the Maurice River, which is not used for drinking water, had arsenic concentrations above the Safe Drinking Water MCL. Although the Department suspects that many of the arsenic exceedances result from natural sources, anthropogenic sources may also contribute to elevated concentrations. Industrial use of arsenic is predominantly as a wood preservative, although it may also be used in paints, dyes, metals, drugs, soaps, and semiconductors. Mining and smelting may also contribute to arsenic contamination, as well as past agricultural uses in making pesticides and weed killers before it was banned. Table 4.4-2 and Figures 4.4-3 and 4.4-4 depict the percentages and spatial extent of arsenic exceedances statewide.

Table 4.4-2: Exceedances of Drinking Water Supply Criteria for Arsenic, Statewide Percentages

Arsenic	# of AUs	% of Assessed AUs	% of Total AUs
Meets Criteria	55	**26**	**7**
Exceeds Criteria	154	74	**20**
Insufficient Data	580		**73**
Total Assessed	209		26
Total # of AUs	789		

Figure 4.4-3: Exceedances of Drinking Water Supply Criteria for Arsenic, Statewide Percentages

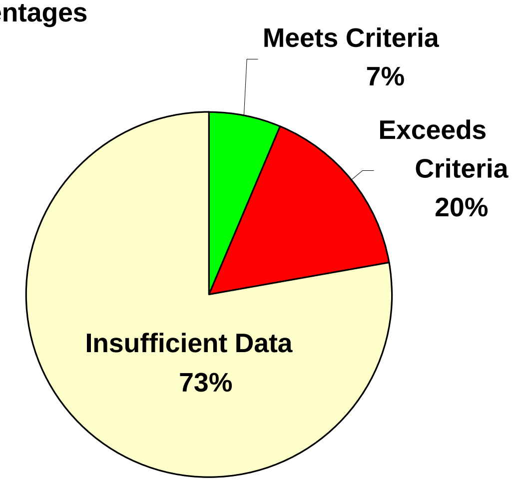
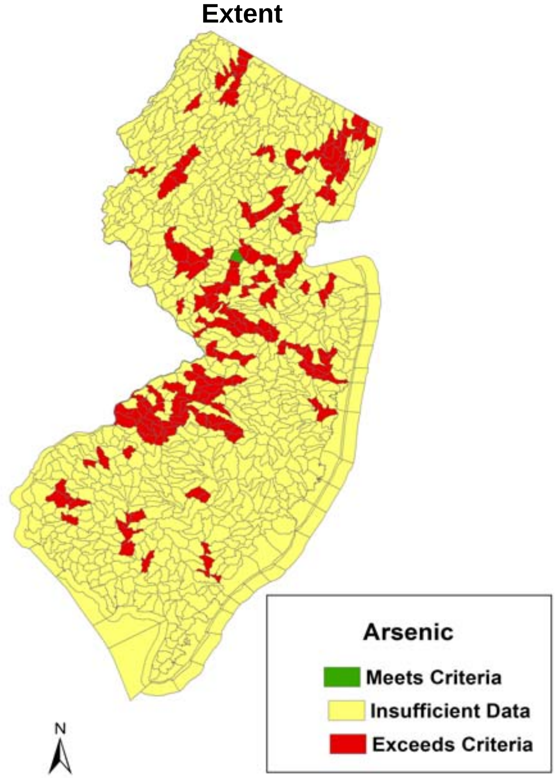


Figure 4.4-4: Exceedances of Drinking Water Supply Criteria for Arsenic, Statewide Spatial Extent



Nitrate

Even though the relative number of exceedances of the SWQS criterion for nitrate was low (9 AUs for nitrate compared to 160 AUs for arsenic), nitrate in drinking water is a serious concern as it is associated with causing methemoglobinemia ("blue baby syndrome"), a potentially fatal condition that occurs when an infant's blood cannot transport sufficient oxygen. There was a net increase in nitrate listings from 6 to 9 AUs on the 2008 303(d) List but only two listings reflected a decline in water quality. One new listing resulted from data collected from previously unassessed waters and another new listing was for waters that were inadvertently omitted from the 2006 303(d) List. The other five subwatersheds on the 2008 303(d) List were carried over from 2006 and one subwatershed on the 2006 303(d) List was delisted because it now meets the surface water quality criterion for nitrate. Table 4.4-3 and Figures 4.4-5 and 4.4-6 depict the percentages and spatial extent of nitrate exceedances statewide.

Table 4.4-3: Exceedances of Drinking Water Supply Criteria for Nitrate, Statewide Percentages

Nitrate	# of AUs	% of Assessed AUs	% of Total AUs
Meets Criteria	490	**98**	**63**
Exceeds Criteria	9	**2**	**1**
Insufficient Data	287		**36**
Total Assessed	499		64
Total # of AUs	786		

Figure 4.4-5: Exceedances of Drinking Water Supply Criteria for Nitrate, Statewide Percentages

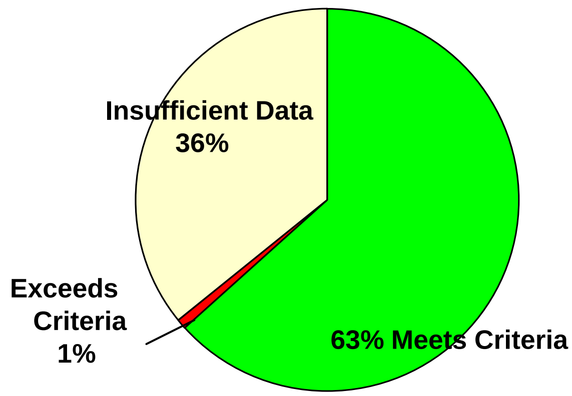
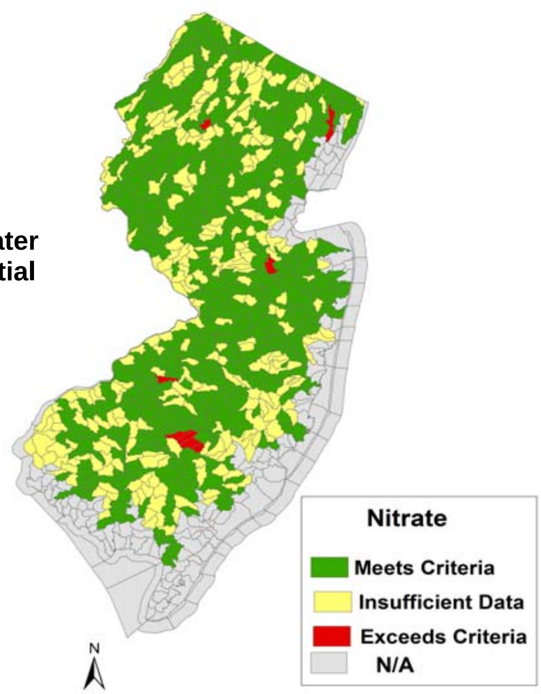


Figure 4.4-6: Exceedances of Drinking Water Supply Criteria for Nitrate, Statewide Spatial Extent



Sources of Parameters Causing Non-Attainment

The potential sources of parameters causing non-attainment of the drinking water use were identified through the use of Geographic Information Systems (GIS) computer technology (see “Identifying Sources of Impairment” in Section 4.1 for a detailed explanation of assessment procedure). Based on this methodology, urban runoff was associated with the largest number of AUs not attaining the drinking water supply use. Agriculture land uses and natural sources of arsenic represent the next most predominant potential sources of parameters causing non-attainment, followed by Industrial Point Sources.

Actions Taken To Date

- July 7, 2008, amendments to the Water Quality Management Planning (WQMP) Rules at N.J.A.C. 7:15 became effective, including a requirement that updated wastewater management plans address septic density in a manner that demonstrates compliance with a 2 mg/L (ppm) nitrate planning standard. On July 7, 2008, the Department adopted concurrent amendments to the GWQS antidegradation policy that require new and expanded domestic treatment works that discharge to Class II and Class III ground water to demonstrate compliance with the antidegradation policy by maintaining 2 mg/L nitrate over the HUC 11 watershed and by maintaining 6 mg/L nitrate over the property served by the wastewater treatment facility.

- The Department’s Mercury Task Force released Volumes 2 (Exposure and Impacts) & 3 (Sources of Mercury to New Jersey’s Environment) of its report and recommendations, many of which have already been undertaken by the Department (see Section 5.8: Atmospheric Deposition Reduction Strategies).

- The Department adopted amendments to the NJPDES rules that require major facilities discharging to PCB-impaired waters to monitor their receiving waters for PCBs using method 1668A, as well as “Requirements for Dental Facilities” to reduce the levels of mercury discharged to publicly owned treatment works (POTWs). These amendments will reduce mercury discharges from dental facilities, which can contribute as much as 35 - 45%of the mercury entering POTWs. See Chapter 5, Section 5.4 “Water Pollution Control Programs,” as well as “Actions Taken” under Section 4.6 “Fish Consumption Use,” for additional information regarding current mercury management.

- The Department completed a major study of atmospheric deposition of mercury and a number of other contaminants through the New Jersey Atmospheric Deposition Network. The Department funded research to investigate historic and current trends in mercury deposition in waterbodies as reflected in sediment concentrations and surface waters, and also continues to monitor mercury levels in fish and issue fish consumption bans and health advisories. Additional information regarding these studies and other mercury-related research is available on the Department’s Web site at http://www.state.nj.us/dep/dsr/mercury/.

- The Department continues to support the National Atmospheric Deposition Program’s Mercury Deposition by supporting the operation of a monitoring station in New Brunswick, New Jersey that was originally established and funded by the USGS. The Department's support of this monitoring station will ensure that up-to-date information on atmospheric deposition of mercury in the State continues to be available. These data are available to the public at the National Atmospheric Deposition Program Mercury Deposition Network Web site at http://nadp.sws.uiuc.edu/sites/siteinfo.asp?id=NJ30&net=MDN.

Actions Planned

- Although the Department has extensive data on conventional pollutants in rivers and streams, drinking water supply use attainment is also affected by metals, for which there are limited data in State waters. The Department plans to explore methods for prioritizing metals monitoring in AUs with a high likelihood of metal contamination, using sediment quality and benthic macroinvertebrate data as screening tools to focus monitoring in AUs likely to exceed water quality standards (see Chapter 9 - Next Steps).

4.5 Industrial and Agricultural Water Supply Uses

Industrial Water Supply Use refers to waters used for processing or cooling and applies to all FW2 waters. Agricultural Water Supply Use refers to waters used for field crops, livestock, horticulture, and silviculture, and applies to all FW2 and PL waters. However, many of the waters designated for Industrial and/or Agricultural Use are not used for these purposes due to stream size and land use constraints.

Assessment Methods

The key parameters for assessing **industrial water supply use** are total suspended solids (TSS) and pH. The key parameters for assessing **agricultural water supply use** are total dissolved solids (TDS) and salinity. Sections 6.6 and 6.7 of the Methods Document (Appendix F) provide a detailed description of the assessment methods for these two designated uses.

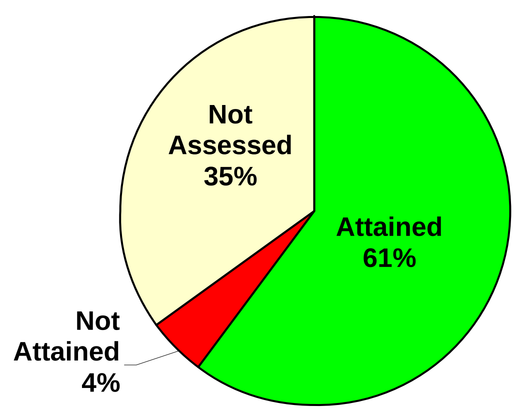
Assessment Results

Assessment results for industrial water supply use are summarized in Table 4.5-1 and Figures 4.5-1 and 4.5-4. Of the 642 AUs to which the industrial water supply use applies, 61% attained the use, 4% did not attain the use, and 35% were not assessed. Of the 419 (65%) AUs assessed for the industrial water supply use, 93% attained the use and 7% did not.

Table 4.5-1: Assessment Results for Industrial Water Supply Use, Statewide Percentages

Industrial Water Supply	# AUs	% of AUs Assessed	% of Total AUs
Attained	390	**93**	**61**
Not Attained	29	7	**4**
Not Assessed	223		**35**
Total Assessed	419		65
Total Applicable AUs	642		

Figure 4.5-1: Assessment Results for Industrial Water Supply Use, Statewide Percentages



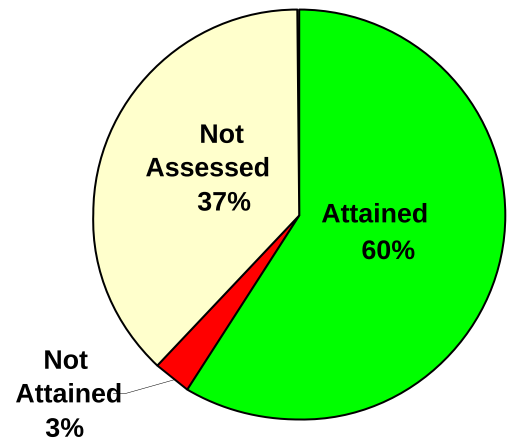
Assessment results for agricultural water supply use are summarized in Table 4.5-2 and Figures 4.5-2 and 4.5-4. Of the 789 AUs to which the **agricultural water supply use** applies, 60%

attained the use, 3% did not attain the use, and 37% were not assessed. Of the 501 (64%) AUs assessed for the agricultural water supply use, 95% attained the use, and 5% did not.

Table 4.5-2: Assessment Results for Agricultural Water Supply Use, Statewide Percentages

Agricultural Water Supply	# of AUs	% of AUs Assessed	% of Total AUs
Attained	474	**95**	**60**
Not Attained	27	5	**3**
Not Assessed	288		**37**
Total Assessed	501		64
Total Applicable AUs	789		

Figure 4.5-2: Assessment Results for Agricultural Water Supply Use, Statewide Percentages



Spatially, attainment of both industrial and agricultural water supply uses share some similarities, with a small number of AUs that did not attain the agricultural water supply use generally confined to the northeast portion of the State (Figure 4.5-3) and a similar number of AUs that did not attain the industrial water supply use (Figure 4.5-4) littered between the northeast and central/southwest portion of the State.

Figure 4.5.3: Assessment Results for Agricultural Water Supply- Spatial Extent

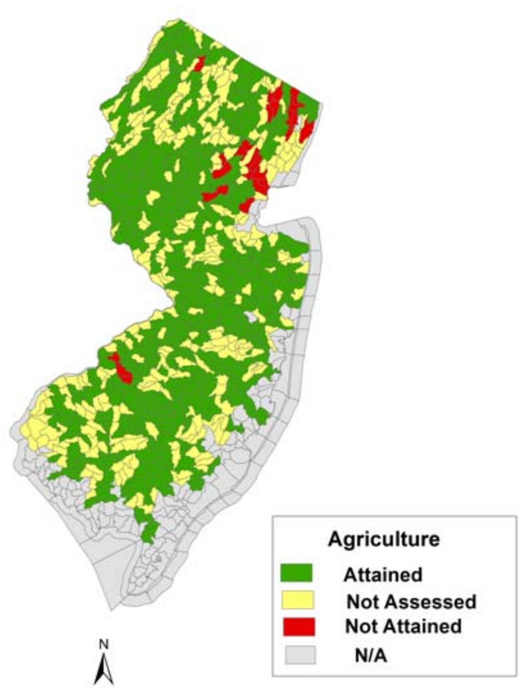
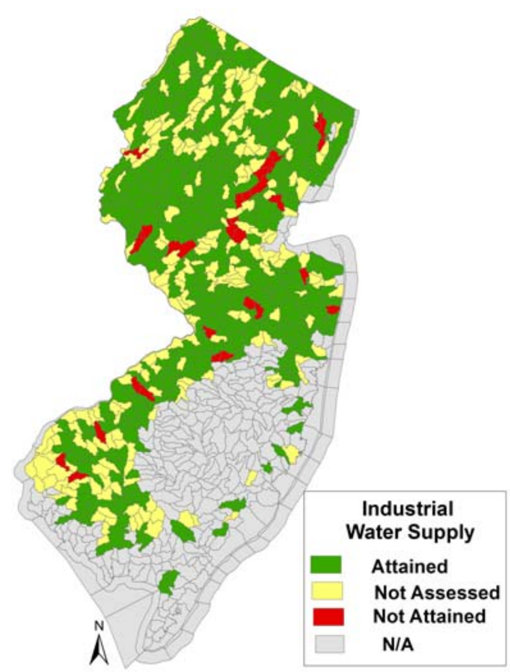


Figure 4.5.4: Assessment Results for Industrial Water Supply- Spatial Extent



Parameters Causing Non-Attainment

For the 29 AUs that did not attain the industrial water supply use, 23 AUs had exceedances of the SWQS criteria for TSS, 4 AUs had exceedances of the pH criteria, and 2 AUs had exceedances of both criteria. Exceedances of the TDS criteria were responsible for all 27 AUs that did not attain the agricultural water supply use.

Sources of Parameters Causing Non-Attainment

The potential sources of parameters causing non-attainment of the industrial and agricultural water uses were identified through the use of Geographic Information Systems (GIS) computer technology (see "Identifying Sources of Impairment" in Section 4.1 for a detailed explanation of assessment procedure). Based on this methodology, urban runoff and agricultural sources were associated with the largest number of AUs not attaining both agricultural and industrial water supply uses. Municipal point sources were a much less predominant potential source of parameters causing non-attainment.

Actions Taken To Date

- None

Actions Planned

- A total of 8 TMDLs for TSS are scheduled in the Millstone River Watersheds (WMA 10) and the Raritan River, Green Brook, and Weamaconk Creek Watersheds (WMA 9).

Chapter 4: Results of the 2006 Water Quality Assessment

4.6 Fish Consumption Use

Attainment of the fish consumption use refers to fish whose tissues do not contain excessive levels of toxic contamination and are therefore safe for human consumption. While this use is not expressly identified in the New Jersey Surface Water Quality Standards, "fishable" waters is a goal of the federal Clean Water Act; therefore, the Department assesses the fish consumption use as part of the Integrated Report. All New Jersey waters are designated for the fish consumption use. Fish consumption advisories are discussed as a public health concern in Chapter 6, Section 6.2.

Assessment methods

Fish consumption use assessments are based on the presence of fish consumption advisories resulting from site-specific data rather than statewide advisories. Statewide fish consumption advisories are considered insufficient data upon which to base a fish consumption use assessment. Where a site-specific fish consumption advisory has been issued for any portion of an assessment unit (AU), including a lake, the entire AU was assessed as not attaining the fish consumption use. Data collection, risk assessment, and issuance of fish consumption advisories are all overseen by the New Jersey Interagency Toxics in Biota Committee (ITBC), a joint effort between the Department and the Department of Health and Senior Services. Fish consumption advisories are developed to protect human health based on fish tissue testing, which analyzes the edible portions of individual fish for one or more bioaccumulative chemicals (e.g., polychlorinated biphenyls (PCBs), chlorinated pesticides, dioxins, and mercury). Details regarding the assessment methodology for the fish consumption use are provided in Sections 4.3 and 6.3 of the Methods Document (Appendix F).

Assessment Results

Assessment results for the fish consumption use are summarized in Table 4.6-1 and Figures 4.6-1 and 4.6-2. The fish consumption use applies to all 970 AUs in New Jersey and none of these attained the use. Wherever an assessment was conducted (37% or 356 assessment units), levels of contaminants found in fish tissue were high enough to warrant issuance of a consumption advisory or ban; therefore, 0% of assessment units attained the use, 37% did not attain the use, and 63% were not assessed.

Table 4.6-1: Assessment Results for Fish Consumption Use, Statewide Percentages

Fish Consumption	# of AUs	% of AUs Assessed	% of Total AUs
Attained	0	**0**	**0**
Not Attained	356	100	**37**
Not Assessed	614		**63**
Total Assessed	356		37
Total Applicable AUs	970		

Figure 4.6-1: Assessment Results for Fish Consumption Use, Statewide Percentages

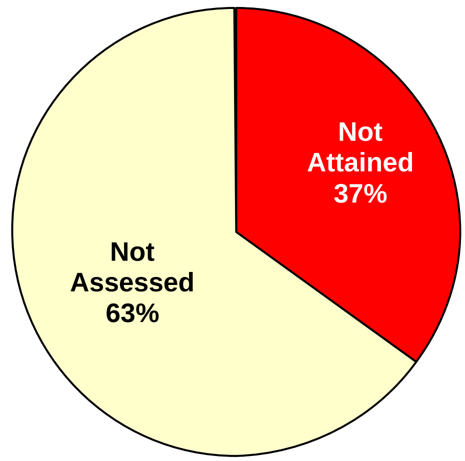
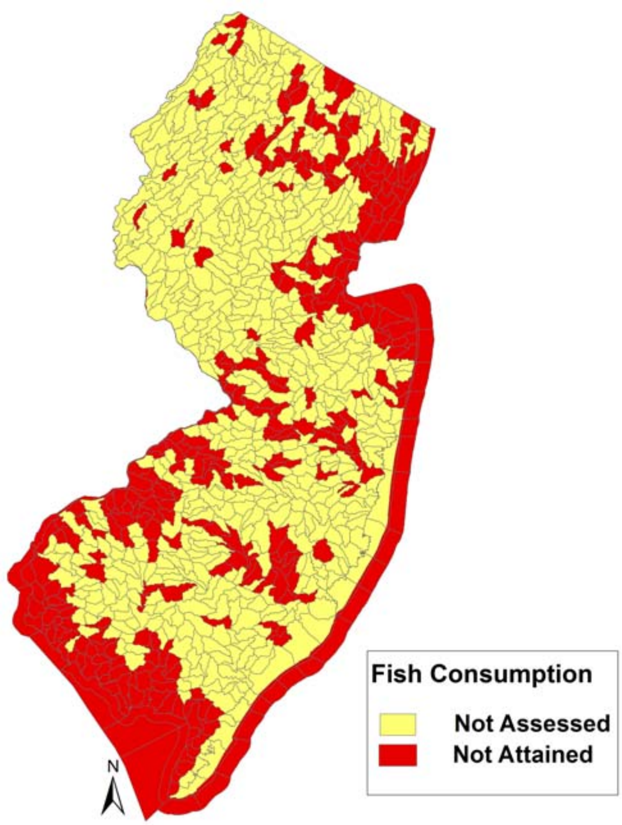


Figure 4.6-2: Assessment Results for Fish Consumption Use - Statewide Spatial Extent



Parameters Causing Non-Attainment

Non-attainment of the fish consumption use was principally due to fish consumption advisories or bans issued because of PCB or mercury contamination of fish in rivers and coastal waters, and mercury contamination of fish in lakes. Mercury was responsible for the greatest number of fish consumption advisories in rivers; followed by PCBs, and DDT and its metabolites DDD and DDE (collectively referred to as DDx). Mercury, PCBs, cyanide, and pesticides (DDx, dieldrin, chlordane, and dioxin) causing fish consumption advisories comprise almost 50% of 2008 303(d) List of Water Quality Limited Waters. Details regarding which waters and species of fish are covered by fish consumption advisories are available on the Department's Web site at www.FishSmartEatSmartNJ.org.

Sources of Parameters Causing Non-Attainment

The potential sources of parameters causing non-attainment of the fish consumption use were identified through the use of Geographic Information Systems (GIS) computer technology (see "Identifying Sources of Impairment" in Section 4.1 for a detailed explanation of assessment procedure). Based on this methodology, atmospheric deposition and urban runoff were associated with the greatest number of AUs not attaining the fish consumption use, followed by agriculture. Other potential sources of these pollutants are contaminated sites and in-place sediments in lakes and rivers.

Actions Taken To Date

For most species of fish and regions of the State, concentrations of PCBs and chlordanes have decreased markedly compared to evaluations made a decade ago, due to the bans on these chemicals imposed in the 1970's and '80's. The observed decreases could be due to environmental cleanups, pollution prevention programs, chemical degradation, or changes in the bioavailability of contaminants. Reductions in releases from in-state power plants, industrial sources, and dental facilities are expected to reduce mercury loadings. Although environmental levels of some contaminants, such as PCBs, are declining, these reductions are not sufficient to eliminate the need for fish consumption advisories. The number of waters listed as impaired based on fish consumption advisories for these pollutants is expected to increase in the future due to their persistence in the environment and expanded monitoring and assessment.

- The USEPA developed a TMDL in cooperation with Delaware, Pennsylvania, and New Jersey to address impairment of the Delaware Estuary from elevated levels of PCBs in the tissue of fish caught in parts of the Delaware River from Trenton to the Delaware Bay. USEPA established the TMDL on behalf of the three states based on the work of the Delaware River Basin Commission (see Chapter 5, Section 5.12 "Regional Initiatives" for details).

- On December 18, 2006, the Department adopted amendments to the NJPDES rules that require major facilities discharging to PCB-impaired waters to monitor their receiving waters for PCBs using method 1668A (see 37 N.J.R. 4723(a)). Based on the results of the monitoring, some facilities will be required to develop and implement a PCB Pollutant

Minimization Plan (PMP). See Chapter 5, Section 5.4 "Discharge to Surface Water Permits" for additional information.

- On October 1, 2007, the Department adopted amendments to the NJPDES rules targeted at reducing the levels of mercury discharged to publicly-owned treatment works (POTWs) (see 39 NJR 4117(a)). The new rules, entitled "Requirements for Dental Facilities" at N.J.A.C. 7:14A-21, will reduce mercury discharge from dental facilities. Dental facilities contribute as much as 35 to 45% of the mercury entering POTWs. See Chapter 5, Section 5.4 "Water Pollution Control Programs" for additional details. The Department has also initiated a broad effort to reduce environmental mercury from air deposition based on recommendations from the Mercury Task Force (see Chapter 5, Section 5.8)

- The interstate Contamination Assessment and Reduction Project (CARP) is studying the fate and transport of contaminants discharged into the Harbor Estuary and will use this information to take necessary action to reduce the discharges of these contaminants. CARP was created to address problems associated with the management of existing contaminated dredged material in the New York/New Jersey Harbor Estuary and to develop solutions to reduce this contamination in the future. The Assessment Phase of CARP was completed in 2007 and developed a mathematical model designed to help understand the fate and transport of contaminants in the Estuary. This model is now being used by the Harbor Estuary Program to establish TMDLs for toxics in the Harbor (see Chapter 5, Section 5.12 for more details).

- The Department commenced targeted fish tissue sampling near air deposition monitoring stations to evaluate the effectiveness of stack emission controls on reducing air deposition of mercury to surface waters. The data collected during this study will assist New Jersey in determining the extent of New Jersey mercury emissions that contribute to local sources of mercury accumulation in fish tissue collected in New Jersey, and establishing a correlation between reducing mercury emissions and accumulation of mercury in fish tissue. See Section 5.8, Atmospheric Deposition Reduction Strategies for more details.

- In 2005, the Department and USGS began a limited synoptic study to determine dissolved mercury concentrations using ultra-clean sample-collection techniques. Samples were analyzed for dissolved mercury using EPA Method 1631. The results indicated that all locations in the study area met the SWQS of 0.05 *u*g/l. In 2007, a second study was initiated to evaluate seasonal fluctuations of total mercury and total methylmercury concentrations at reference stations and to compare results obtained using one-person and two-person sample-collection methods. Results obtained using the one-person sample-collection method were comparable to those obtained using the more labor-intensive two-person sample-collection method.

Actions Planned

- The Department plans to conduct additional monitoring to evaluate the effectiveness of the new NJPDES rule requirements for dental facilities in reducing mercury concentrations in receiving waters.

Chapter 4: Results of the 2008 Water Quality Assessment

4.7 Shellfish Harvest Use

The shellfish harvest use refers to the harvest of mollusks (commonly known as clams, oysters, and mussels) that are safe for human consumption without further treatment such as depuration and seasonal restrictions. The shellfish harvesting use is designated in all waters classified as saline coastal (SC) and saline estuary-1 (SE1). New Jersey has been a national leader in maintaining and enhancing waters available for shellfish harvest.

Assessment Methods

The Department regulates the harvesting of shellfish by applying specific classifications to bay, estuarine, and ocean waters. Waters are classified as "Approved", "Harvestable: Special Restricted", "Harvestable: Seasonal", or "Prohibited Harvest". The Department's Bureau of Marine Water Monitoring determines shellfish classifications based on its sampling of coliform bacterial concentrations (indicators of the presence of pathogens) in the water column and the assessment procedures of the National Shellfish Sanitation Program (NSSP). Waters classified as "Approved" have no restrictions on shellfish harvesting by licensed harvesters. Waters classified as "Harvestable" are restricted to shellfish harvesting seasonally (either from November through April or January through April of each year) or by special permit. Shellfish harvested by special permit must be further purified prior to being sold, either by relay to shellfish waters classified as "Approved" or by processing in a depuration plant. The legal description of shellfish classification areas is updated annually at N.J.A.C. 7:12 and is included in the SWQS by reference at N.J.A.C. 7:9B-1.12. The official Shellfish Classification maps are available on the Department's Web site at www.state.nj.us/dep/wms/bmw and should be referenced for determining the exact locations of these boundaries.

The shellfish harvest use assessment methodology is based on the shellfish classifications established under N.J.A.C. 7:12. Only waters classified as "Approved" are assessed as attaining the shellfish harvest use; all other classifications are assessed as not attaining this use. A single assessment unit (AU) may include waters with different shellfish classifications. In most instances, the use assessment is based on the most restrictive classification found within the AU. Areas subject to administrative closure are not assessed (i.e., not applicable) for the shellfish harvest use. Administrative closure of a shellfish classification area is a precautionary measure required under the NSSP to restrict harvest an areas that could potentially be affected by pollution, such as marinas and sewage outfalls. All confines of a marina are subject to administrative closure and are automatically classified as prohibited for shellfish harvesting. The administrative closure around a marina may be expanded or reduced based on actual water quality. See Appendix F: Methods Document, Section 5.0 for more information.

Assessment Results

Assessment results for the shellfish harvest use are summarized in Table 4.7-1 and Figure 4.7-1. The shellfish harvest use is applicable to 169 AUs in New Jersey. All (100%) AUs were assessed, 65% attained the use, and 35% did not. The percentages and spatial extent shown in Figures 4.7-1 and 2 reflect only those AUs where the shellfish harvest use applies.

Table 4.7-1: Assessment Results for Shellfish Harvest Use, Statewide Percentages

Shellfish Harvest	# of AUs	% of AUs Assessed	% of Total AUs
Attained	110	65	65
Not Attained	59	35	35
Not Assessed	0		0
Total Assessed	169		100
Total # AUs	169		

Figure 4.7-1: Assessment Results for Shellfish Harvest Use, Statewide Percentages

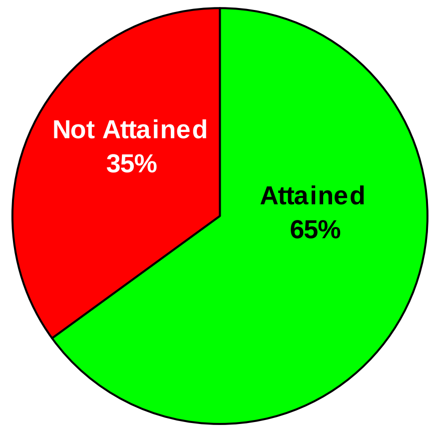
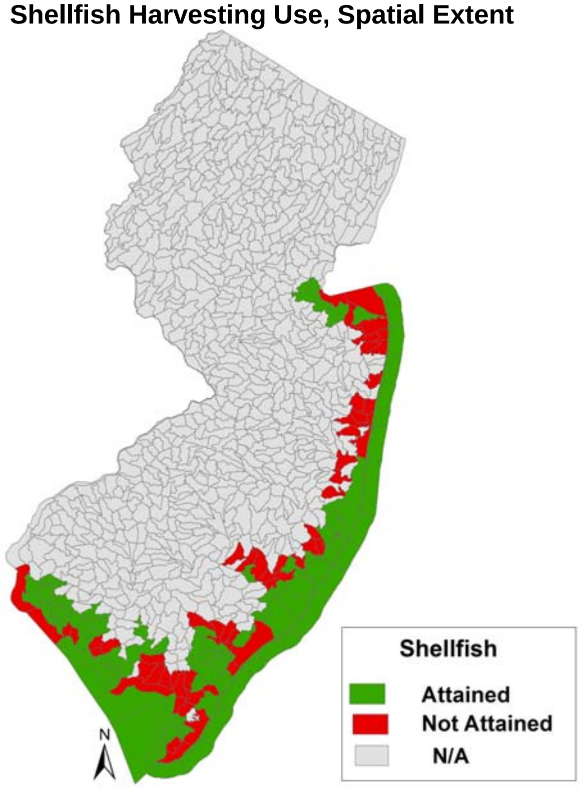
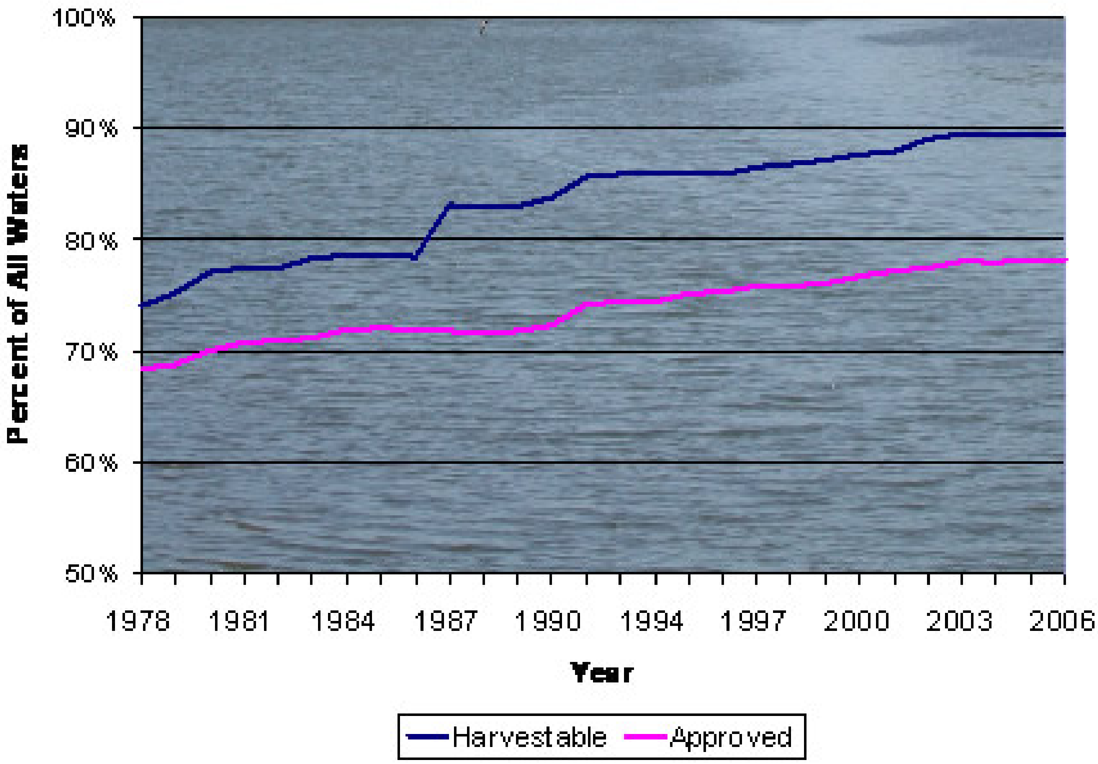


Figure 4.7-2: Assessment Results for Shellfish Harvesting Use, Spatial Extent



The statewide spatial representation of the shellfish harvest use assessment results is presented in Figure 4.7.2. These results depict a greater percentage of New Jersey's waters as not attaining the shellfish harvest use then the percent of waters classified by the Department as harvestable (see Figure 4.7-3). This is because areas opened seasonally or that allow for relay and depuration, though still harvestable, are considered impaired under USEPA Guidance for the Integrated Report. Since 2002, shellfish waters approved for unrestricted harvest increased by 7,000 acres, indicating a trend toward general improvement in water quality in New Jersey's estuaries.

Figure 4.7-3: New Jersey Harvestable and Approved Shellfish Waters*



Parameters Causing Non-Attainment

The parameters used to classify waters for shellfish harvest are fecal and total coliform bacteria concentrations (as pathogen indicators).

Sources of Parameters Causing Non-Attainment

Potential pathogen sources were identified as part of *The 1995 National Shellfish Register* (NOAA, 1997) by the Department's Bureau of Marine Water Monitoring (BMWM), which supplied information to the National Oceanic and Atmospheric Administration (NOAA) about individual shellfish growing areas within state jurisdictional waters. The BMWM identified the presence of 12 different sources of pollution, including agricultural feedlots and marinas, grouped into three broader categories: point, nonpoint, and upstream sources. In estuarine waters, marinas, boating, urban runoff, and stormwater were identified as major contributing factors affecting shellfish. In addition, potential pollutant sources identified through the TMDL process include marinas, failing septics systems and sewers, wildfowl (seagulls and geese) and other wildlife waste, pet waste, and agricultural runoff.

Actions Taken To Date

New Jersey has had a long history of improving the sanitary quality of its coastal waters. Each year, the Department updates the classification of New Jersey's coastal waters for shellfish harvesting based on analysis of extensive monitoring data (over 15,000 samples per year) and pollution source surveys. This usually results in the upgrade of shellfish waters and the expansion of harvestable waters. The general trend in water quality improvement is probably due to the relocation of domestic wastewater discharges to offshore areas and the replacement of individual subsurface disposal systems with sanitary sewers. However, a few isolated instances of failing septic systems remain which still adversely affect water quality. Recreational activities may also have a seasonal impact on shellfish waters.

- The Department upgraded a net of 12,975 acres of shellfish waters between 2002 and 2006. Detailed information on shellfish classifications is available on the Department's Web site at http://www.state.nj.us/dep/wms//bmw/data.htm.

- "No Discharge Zones" were instituted in some areas, such as the Manasquan, Shark, Shrewsbury, and Navesink Rivers and Barnegat Bay, under the Clean Vessels Act. The discharge of human waste from boats into the estuary/bays in these areas is prohibited. These requirements are expected to facilitate further improvements in water quality in these shellfish waters.

Actions Planned

The Department plans to perform stormwater monitoring studies to identify and track down pollution sources affecting the State's coastal waters. The Department will continue to use analytical methods such as coliphage and Multiple Antibiotic Resistance (MAR) and will investigate new procedures including Optical Brighteners and qPCR. This strategy will aid in identifying, prioritizing, and remediating pollution sources in the State's shellfish waters. Information regarding these new technologies is available at the following Web sites:

- For information on MAR go to: http://www.springerlink.com/content/p5p4413ku0082707/.

- For optical brighteners go to: http://notes.tetratech-ffx.com/newsnotes.nsf/0/e97b45f666caa0a4852569cb00664a1f?OpenDocument, and http://www.novaregion.org/obm.htm.

- For information on qPCR go to: http://www.epa.gov/futureofscience/respond/beachmonitoring.html.

Chapter 4: Results of the 2008 Water Quality Assessment

4.8 Integrated Assessment and Listing Process

2008 Integrated List of Waters

Development of the Integrated List:

Once all the designated use assessments are completed, the Department develops the Integrated List of Waters (Integrated List). The USEPA Guidance for developing Integrated Reports (USEPA 2005) recommends placing the assessment results into one of five specific categories or sublists An overview of the process for developing the Integrated List is provided in Chapter 3, Section 3.1 of this report while a detailed description of the listing process is included in the 2008 Integrated Water Quality Monitoring and Assessment Methods (Appendix F: Methods Document). Designated use assessments are based on the evaluation of all readily available data that meets QA/QC requirements (see Appendix F: Methods Document, Chapter 3). Each assessment unit is assessed for each applicable designated use and assigned to one of the five sublists, resulting in a total of 3,628 individual designated use assessments conducted for the 2008 Integrated List (Appendix A).

When assessing each designated use, the Department determines whether the use is being met ("attained"), not met ("not attained"), or that sufficient data is not available to assess the use based on the protocol established in the Methods Document ("not assessed"). The minimum data set required by the corresponding protocol must be available to assess the designated uses applicable to each assessment unit (AU). Where the designated use is attained, the assessment unit may be placed on Sublist 1 or 2, depending on the assessment results for other designated uses in the same AU. The assessment unit/designated use combination is assigned to Sublist 2 unless all other designated uses applicable to that AU (except fish consumption) are assessed and attained, in which case the AU is placed on Sublist 1. AUs with insufficient data to assess use attainment are assigned to Sublist 3 for that designated use. If some data is available indicating non-attainment but it comprises less than the minimum data set, the designated use/AU combination is assessed as "not attained" and assigned to either Sublist 4 or 5. When a designated use is not attained *and* actions have been taken to restore water quality, the designated use/AU combination is assigned to Sublist 4. Where a designated use is not attained and a TMDL is required, the designated use/AU combination is assigned to Sublist 5 and the AU is placed on the 303(d) List of Water Quality Limited Waters (Appendix B) along with the pollutant causing non-attainment. Table 4.8-1 summarizes the decision-making process used to apply use assessment results to the Integrated List. Table 4.8-2 summarizes assessments based on "Best Professional Judgment" (as explained in the Methods Document, Sections 4.1 and 6.2). Sections 4.2 through 4.7 of this Chapter summarize the assessment results for each of the designated uses applicable to each of the State's 970 assessment units, including tables, graphs, and maps. The overall assessment results are summarized in this Section.

Table 4.8-1: Process for Developing the Integrated List

Use Assessment Result	Integrated Assessment	Sublist
Full Attainment	All designated uses are assessed AND all uses are attained. (Based on USEPA guidance, the Fish Consumption Use Assessment is not considered in this determination.)	Sublist 1
Attained	The designated use is assessed and attained BUT one or more designated uses in the assessment unit are not attained and/or there is insufficient information to determine if the use is attained.	Sublist 2
Not Assessed	Insufficient data is available to determine if the use is attained.	Sublist 3
Not Attained	The designated use is not attained or is threatened; however, development of a TMDL is not required because a TMDL has been developed for the pollutant causing non-attainment.	Sublist 4A
Not Attained	The designated use is not attained or is threatened; however, development of a TMDL is not required because other enforceable pollution control requirements are reasonably expected to result in conformance with the applicable water quality standard(s) in the near future and the designated use will be attained. Examples of such requirements include nonpoint source pollution controls, lake restoration projects, NJPDES stormwater permits, and enforcement actions.	Sublist 4B
Not Attained	The designated use is not attained or is threatened; however, development of a TMDL is not required because non-attainment is caused by something other than a pollutant (e.g. "pollution" such as overland flow of stormwater, stream flow alterations, or habitat degradation).	Sublist 4C
Not Attained	The designated use is not attained or is threatened by a pollutant(s) and a TMDL is required.	Sublist 5

Table 4.8-2: Assessment Results Based On Best Professional Judgment (BPJ)

Assessment Unit	Parameter	BPJ Rational
02040104130030-01	TP	Fifty-two (52) samples were collected monthly from 11/2000 to 12/2004 (biweekly in summer months). Fifty samples were below 0.06 mg/l and complied with the 0.1 mg/l criterion. Two samples did not comply with the 0.1mg/l criterion. These samples were collected on 9/23/03 (0.16) and 7/14/03 (0.17). These two samples represent the only episodes of non-compliance. The other 50 samples were below 0.05 mg/l, with an average concentration of 0.03 mg/l. Based on the frequency, magnitude, and duration of the samples, the Department determined that these two samples are excursions and did not cause non-attainment of the designated use. In addition to the available phosphorous data, the Department evaluated the biological monitoring results, which indicated full attainment at three AMNET sites in the AU: two scored “excellent” and one scored “good”, which is an improvement from the previous round of biological monitoring.

Summary of Assessments

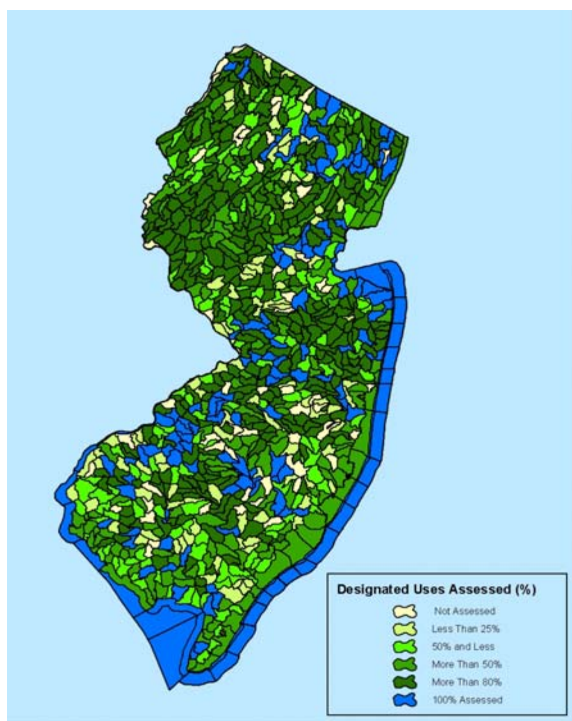
The 2008 Integrated Report is based on 970 assessment units (AUs), which are comprised of New Jersey's 950 HUC 14 subwatersheds and 20 Delaware River zones. Although the New Jersey Surface Water Quality Standards at N.J.A.C. 7:9B (Appendix I) designate nine different uses of waters of the State, not all uses are applicable to all AUs. Between four and eight uses may be designated in an individual AU, depending on the classification of the streams located therein. Assessing all applicable designated uses in all 970 AUs resulted in a total of 3,616 individual use assessments (out of 5,495 possible designated use/assessment unit combinations), and the evaluation of another 1,879 combinations that had insufficient information to assess uses. The uses designated for the various stream classifications in New Jersey are as follows:

- Aquatic Life (General) - All Waters
- Aquatic Life (Trout) – FW1 & 2, PL, classified as Trout Production or Trout Maintenance
- Primary Contact Recreation - FW1 & 2, PL, SC, SE1
- Secondary Contact Recreation – SE2, SE3
- Drinking Water - FW2, PL
- Agriculture Water Supply - FW2, PL,
- Industrial Water Supply - FW2
- Fish Consumption - All Waters
- Shellfish Harvest - SC, SE1

Assessment

The Department's goal is to assess all 970 AUs for all applicable designated uses. Of the State's 970 AUs, 49% (480) were assessed for all applicable designated uses except fish consumption, double the number fully assessed in 2006 (see discussion of Sublist 1, below). Eighteen percent (18%) of AUs were assessed for all applicable designated uses <u>including</u> fish consumption. Ninety-four percent (94%) of AUs were assessed for at least one designated use (see Figure 4.8-1).

Figure 4.8-1: Percentage of Applicable Designated Uses Assessed per AU



Assessment Results

Figure 4.8-2: 2008 Integrated List Results

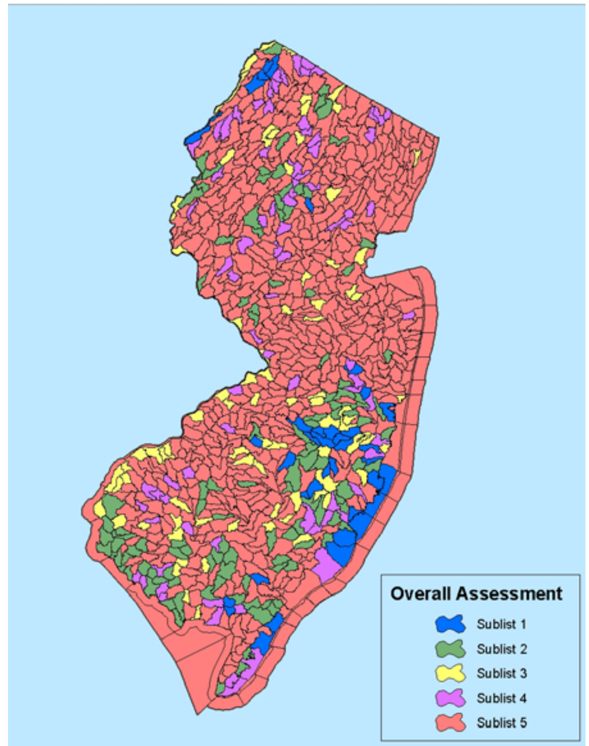


Figure 4.8-2 and Table 4.8-3 summarize the results of the individual use assessments for each sublist of the 2008 Integrated List of Waters. Thirty-seven AUs were assigned to Sublist 1, which means that designated uses were fully attained[3] in 8% of fully assessed (480) AUs, or 4% of all 970 AUs. By comparison, the 2006 Integrated List of Waters contained 24 AUs assigned to Sublist 1 (10% of 241 fully assessed AUs; 3% of all 970). Out of the 5,495 possible AU/designated use combinations, 1,661 AU/designated use combinations were assigned to Sublist 2 as attaining the designated use, and 1,879 were assigned to Sublist 3 due to insufficient data to assess use attainment. The Department developed TMDLs for 402 AU/designated use combinations, which were assigned to Sublist 4, and 1,401 AU/designated use combinations were assigned to Sublist 5 for not attaining the use. The increase in subwatersheds assigned to Sublist 1 is consistent with the Department's expectation that as the amount of information collected and assessed increases through expanded monitoring, so will the number of subwatersheds found to be attaining all designated uses. For certain designated uses, such as fish consumption, additional monitoring may also result in an increased number of subwatersheds found to not attain the use.

Table 4.8-3: Use Assessment Results per Sublist

Designated Uses	Sublist 1	Sublist 2	Sublist 3	Sublist 4	Sublist 5
Aquatic Life (General)	37	193	117	28	595
Aquatic Life (Trout)	6	36	32	2	120
Recreation	37	150	383	321	79
Drinking Water Supply	26	354	222	6	181
Agricultural Water Supply	26	448	288	0	27
Industrial Water Supply	10	380	223	0	29
Shellfish Harvest	10	100	0	45	14
Fish Consumption	0	0	614	0	356
Total	**152**	**1661**	**1879**	**402**	**1401**

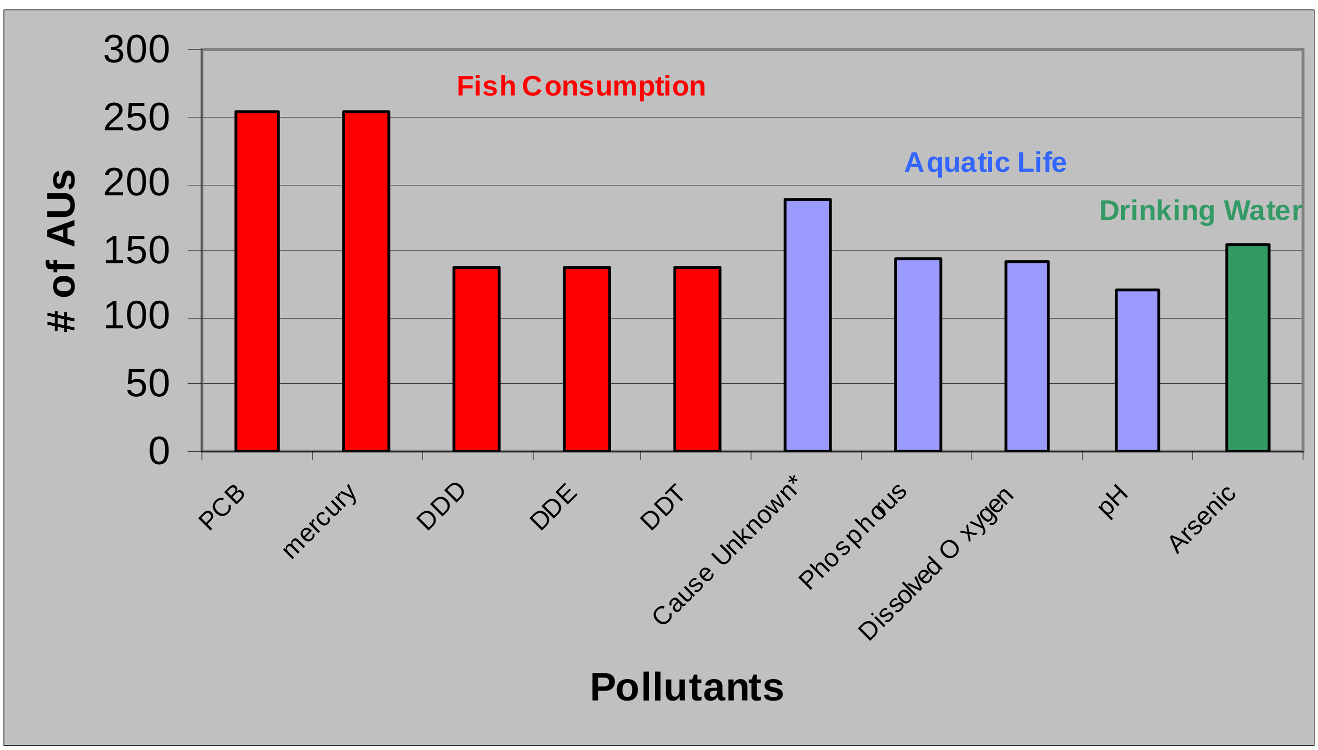
[3] "Fully attained" means all applicable designated uses except fish consumption were assessed and attained, in accordance with USEPA guidelines.

List of Water Quality Limited Waters (303(d) List)

The 2008 Integrated List of Waters identified 745 assessment units (77%) that did not attain at least one of the applicable designated uses, compared to 688 assessment units (71%) in 2006. These assessment unit/designated use combinations are identified on Sublist 5 of the 2008 Integrated List of Waters (Appendix A). The pollutant causing non-attainment of the designated use for each of these combinations is identified on the 2008 List of Water Quality Limited Waters (303(d) List, Appendix B). The Department identified 41 discreet pollutants causing non-attainment of designated uses in one or more assessment units, for a total of 2,304 assessment unit/pollutant combinations on the 2008 303(d) List. The cause of non-attainment was unknown in 189 assessment units. By comparison, the 2006 303(d) List identified 34 pollutants causing non-attainment of the designated use in one or more assessment units, resulting in 2,188 assessment unit/pollutant combinations, 107 of which were attributed to "pollutant unknown".

The top ten pollutants (Figure 4.8-3 and Table 4.8-5) identified on the 2008 303(d) List are responsible for over 70% of the listings. Listings based on fish consumption include PCBs, mercury, DDD, DDE, and DDT. Aquatic life impairments are due to "cause unknown," phosphorus, dissolved oxygen, and pH. The only pollutant identified in the top ten for Drinking Use impairments is arsenic. These pollutants are discussed individually later in this section.

Figure 4.8-3: Top Ten Pollutants on the 2008 303(d), by Designated Use



Note: "Cause Unknown" represents assessment units that did not attain designated uses based solely on biological data.

Comparison of 2006 and 2008 Results:

Water quality and use attainment did not change significantly between the 2006 and 2008 data reporting periods. Where there were notable differences, most were attributable to changes in reporting method (i.e., changes in terminology or nomenclature used), changes in assessment method (i.e., pH in Coastal Plain waters), and changes to the Surface Water Quality Standards (i.e., changes to pH and temperature criteria). Some differences between the 2006 and 2008 303(d) Lists were due to new data or changes in water quality conditions or TMDL approval. These differences are summarized in Table 4.8-4, which shows ten parameters on the 2008 303(d) List that were not listed in 2006, and 3 parameters on the 2006 303(d) List that were not listed in 2008, for a net increase of 7 listed parameters.

Table 4.8-4: Comparison of Pollutants on the 2006 and 2008 303(d) Lists

PARAMETER	2006	2008	PARAMETER	2006	2008
Arsenic	115	154	Nickel	3	4
Benzene	2	2	Nitrate	6	9
Benzo(a)Pyrene*		28	**PAHs***	10	
Cadmium	12	15	**Pathogens***	135	
Cause Unknown*		189	PCBs	252	255
Chlordane	62	77	PCE	7	7
Chloride*		1	pH	193	121
Chlorinated benzene	1	1	Phosphorus	184	143
Chromium	19	18	**Pollutant Unknown***	107	
Copper	39	36	Silver	1	1
Cyanide	9	9	Sulfate	1	5
DDD	118	137	**TCE****		4
DDE	118	137	Temperature	59	69
DDT	118	137	Thallium	1	1
Dieldrin	7	35	**Total Coliform****		14
Dioxin	102	36	Total dissolved solids	19	29
Dissolved Oxygen	115	141	Total suspended solids	48	46
Enterococci*		18	Turbidity	13	21
Fecal Coliform/E.Coli*		62	**Unionized Ammonia****		17
Heptachlor Epoxide*		17	Unknown Toxic	12	12
Hexachlorobenzene*		7	Zinc	8	7
Lead	25	28			
Mercury	267	254	**Total # Parameters**	**34**	**41**

* = Pollutant appeared on the 2008 303(d) List but not on the 2006 303(d) List
** = Pollutant appeared on the 2006 303(d) List but not on the 2008 303(d) List

Most of the ten "new" pollutants that did not appear on the 2006 303(d) List are actually the individual chemical constituents previously listed in 2006 as chemical compounds or categories, i.e., benzo(a)pyrene was included under "PAH"; enterococci, fecal coliform/*E.Coli*, and total coliform were included under "pathogens"; and "cause unknown" (which may not be a pollutant) replaced "unknown pollutant". These changes in nomenclature were made to be consistent with USEPA Assessment Database (ADB), which allows assessment results to be compared on a national or regional basis, and accounts for most of the differences between the 2006 and 2008 303(d) Lists. The only pollutants on the 2008 303(d) List that did <u>not</u> appear in some form on the 2006 List were chloride (one subwatershed), heptachlor epoxide (17 subwatersheds), hexachlorobenzene (seven subwatersheds), and un-ionized ammonia (17 subwatersheds). Significant changes between the 2006 and 2008 303(d) Lists are explained in more detail below.

- There were 82 more listing for "Cause Unknown" (189) in 2008 than for "Pollutant Unknown" (107) in 2006. This change is attributable to an increase in assessments based on data from the Department's expanded biological monitoring network (See Section 4.3: Biological Data, in the Methods Doc.).

- Pathogens, when listed collectively, resulted in 135 listings in 2006 but decreased to 94 total listings for fecal coliform/*E. coli* (62), enterocci (18), and total Coliform (14) combined. This reduction in pathogen listings can generally be attributed to the delisting of individual lakes erroneously listed in 2006 using data that did not to meet the Department's data quality requirements and the approval of pathogen TMDLs (see Appendix C: Delisting Document).

- There were 72 fewer listings for pH in 2008, from 193 in 2006 to 121 in 2008, largely because of the change in the assessment method (See Methods Document, Section 1.2: Naturally Low pH).

- Administrative errors in dioxin listings in 2006 were corrected, which resulted in 66 fewer listing for dioxin in 2008 (102 in 2006 compared to 36 in 2008).

- Phosphorus listings decreased from 184 in 2006 to 143 in 2008. This net decrease is attributable to delisting of 56 AUs for phosphorus, of which 14 were covered by phosphorus TMDLs approved by USEPA, 39 were found to meet surface water quality standards, and three were corrections to the 2006 303(d) List. However, 29% of all AUs exceeded the numeric criteria for phosphorus in 2008 (1% less than in 2006) and 14 new listings for phosphorus were added to the 303(d) List based solely on exceedance of the numeric criteria. The Department has developed a Nutrient Criteria Enhancement Plan (Plan) that describes the Department's strategy for enhancing the existing nutrient criteria for freshwaters and developing nutrient criteria for other (estuarine, marine) waters of the State. The Department is currently developing a new assessment method for freshwaters to better assess nutrient impacts on water quality and use attainment based on compliance with the existing narrative nutrient criteria and policies, rather than the exclusive assessment of compliance with the numeric phosphorus criteria in freshwaters.

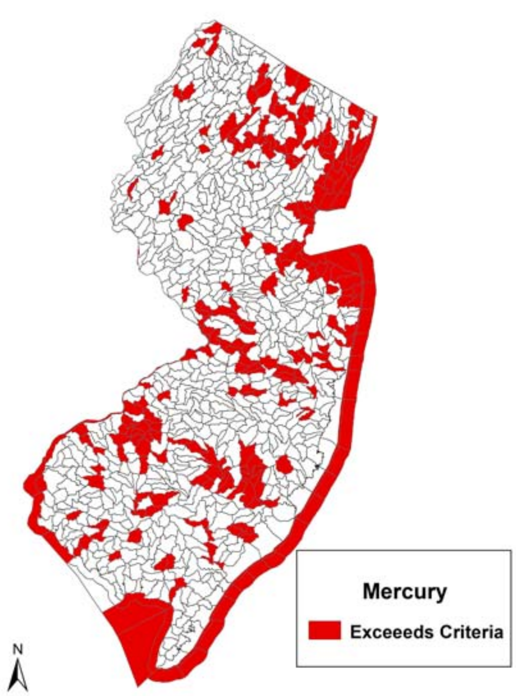
Top Ten Parameters on the 2008 303(d) List

As stated earlier, the ten most frequently listed parameters ("top ten") on the 2008 303(d) List are responsible for over 70% of the listings. In order of frequency, these parameters are mercury, PCBs, "cause unknown", arsenic, phosphorus, dissolved oxygen, DDD, DDE, DDT, and pH (see Table 4.8-5). These are generally the same parameters that appeared most frequently on the 2006 303(d) List but with a different relative frequency.

Table 4.8-5: Top Ten Parameters on the 2008 303(d) List

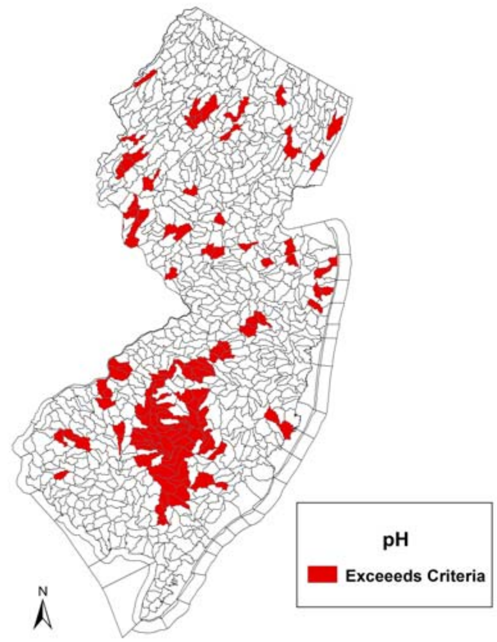
Parameter	# of AU/Pollutant Combinations
PCBs	255
Mercury	254
Cause Unknown	189
Arsenic	154
Phosphorus	143
Dissolved Oxygen	141
DDD	137
DDE	137
DDT	137
pH	121

Figure 4.8.4: Mercury Exceedances



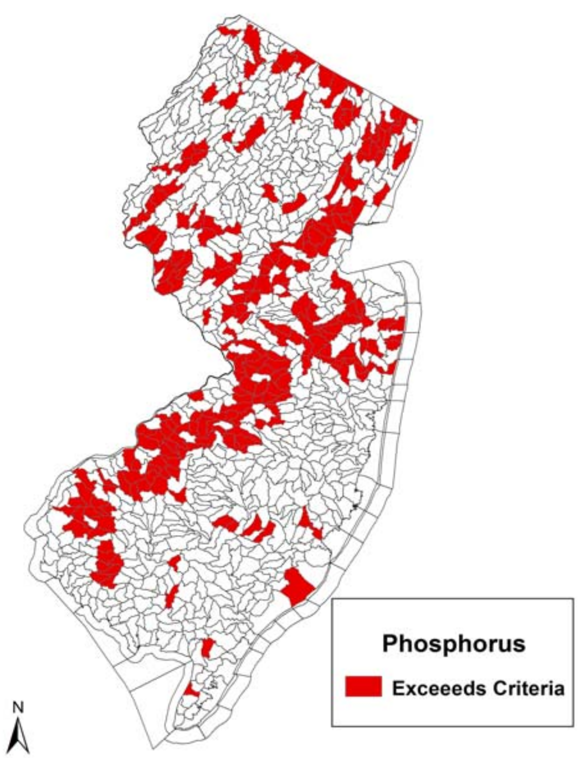
Mercury and PCBs (polychlorinated biphenols): These bioaccumulating substances were the two most frequent pollutants on the 2008 303(d) List, totaling 509 listings between them, and comprising 22% of total List. These listings, along with DDD, DDE, and DDT (which were collectively responsible for 411 listings) are generally associated with fish consumption advisories based on fish tissue analysis, although a few mercury and PCB listings were based on water column data. Figure 4.8-4 displays assessment units where the designated use was not attained because of mercury, either due to a fish consumption advisory or an exceedance of SWQS criteria. PCB levels in fish have declined over time, mostly due to the ban on PCB usage. Reductions in releases from in-state power plants, industrial sources, and dental facilities are expected to reduce mercury loadings. However, these reductions are not sufficient to eliminate the need for fish consumption advisories. Therefore, the number of waters listed as impaired based on fish consumption advisories for these pollutants may increase in the future because health advisories will continue to be issued limiting consumption of fish contaminated with persistent bioaccumulative chemicals such as mercury and PCBs in the aquatic environment (see Section 4.6: Fish Consumption Use Assessment).

Figure 4.8-5: pH Exceedances



pH: pH values outside the established SWQS criteria continue to represent a significant problem in New Jersey waters, since they affect the attainment of the aquatic life use. A total of 121 AUs did not attain their designated uses because of exceedances of the pH criteria (see Figure 4.8-5). Generally, exceedances of the pH criteria are associated with high levels of biological activity (algal and aquatic weed growth) resulting from nutrient over-enrichment (see "phosphorus", below). Low pH levels can also be problematic; however, the Department determined that the low pH levels in the Coastal Plain waters reflect natural conditions and, on that basis, delisted 100 AUs. The Department will be revising the SWQS to amend the pH criteria for these waters (see Section 4.2: Aquatic Life Use Assessment for more details).

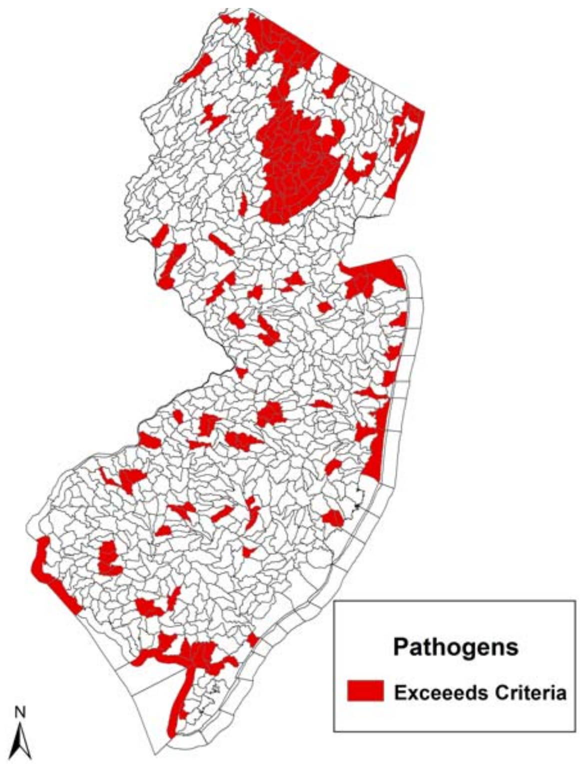
Figure 4.8-6: Phosphorus Exceedances



Phosphorus: A total of 143 AUs were placed on the 2008 303(d) List for exceeding the numeric SWQS criteria for phosphorus, a decrease from the 184 phosphorus listings in 2006 (see Figure 4.8-6). As a result, phosphorus dropped from third to the fifth most frequently listed pollutant on the 303(d) List. Excessive phosphorus may result in adverse impacts to surface waters that cause non-attainment of aquatic life uses. Over-enrichment of phosphorus in freshwater systems can cause adverse ecological impacts such as reduced spawning grounds and nursery habitats, fish kills, and the replacement of the natural flora and fauna with nutrient tolerant biota. These problems can exhibit themselves locally or much further downstream leading to degraded estuaries, lakes, and reservoirs; and to oxygen-starved hypoxic or "dead" zones where fish and aquatic life can no longer survive.

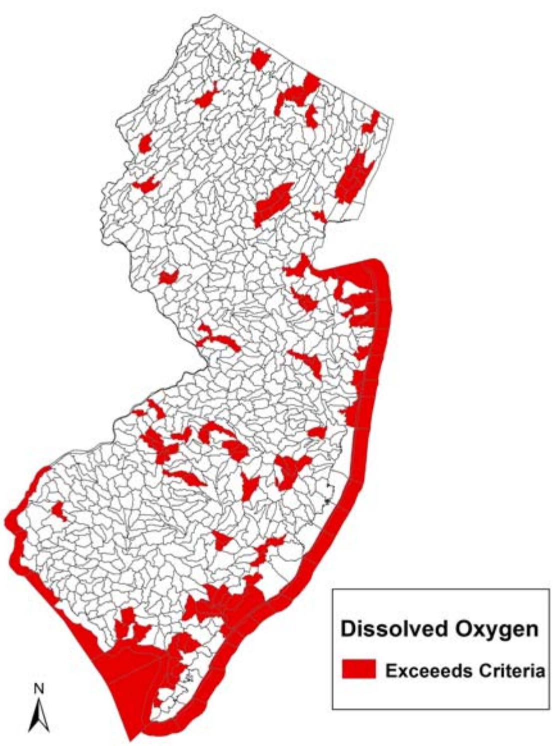
The Department has developed a Nutrient Criteria Enhancement Plan that describes the Department's strategy for enhancing the existing nutrient criteria for freshwaters and developing nutrient criteria for other (estuarine, marine) waters of the State. The Department is currently developing a new assessment method for freshwaters to better assess nutrient impacts on water quality and use attainment based on compliance with the existing narrative nutrient criteria and policies, rather than the exclusive assessment of compliance with the numeric phosphorus criteria in freshwaters. Reassessment of the existing phosphorus listings is expected for the 2010 Integrated Report (see Section 4.2 "Aquatic Life Use" for more details).

Figure 4.8-7: Pathogens Exceedances



Pathogens: Bacterial indicators of pathogens are used to assess attainment of recreation and shellfish harvest uses. In the past, fecal coliform bacteria were the principal pathogenic indicator used to assess recreational uses but was replaced by *Escherichia coli* (*E. coli*) in freshwaters and enterocci in coastal waters. Fecal coliform and total coliform are used to classify shellfish waters, which serves as the basis for assessing the shellfish harvest use. Pathogenic indicators (listed individually) were the cause of non-attainment for 94 AUs in 2008, down from 135 listings for pathogens in 2006 (see Figure 4.8-7). Sources of pathogens to freshwaters are generally nonpoint in nature and include stormwater runoff, failing septic systems, livestock holding areas, illicit cross connections and CSOs (see Section 4.3 Recreational Uses and Section 4.7 – Shellfish Harvest Use).

Figure 4.8-8: Dissolved Oxygen Exceedances



Dissolved oxygen (DO): The SWQS criteria for DO vary depending on the stream classification. The most stringent criteria apply to trout production waters because trout require high DO levels. A total of 141 AUs did not attain the aquatic life use because of DO exceedances (see Figure 4.8-8), an increase over the 115 listed in 2006. This includes 38

AUs containing New Jersey's ocean waters, none of which attained aquatic life uses because of low DO. Low DO in the ocean is due to an extensive anoxic cell that forms off the coast during the summer months and breaks up in the fall. The biological impacts of this low DO cell are currently unknown but are of increasing concern regarding potential impacts to marine biology. The Department is working to develop a benthic indicator that will provide a more accurate assessment of the aquatic life use in ocean waters (see Section 4.2 "Aquatic Life Use" for more details).

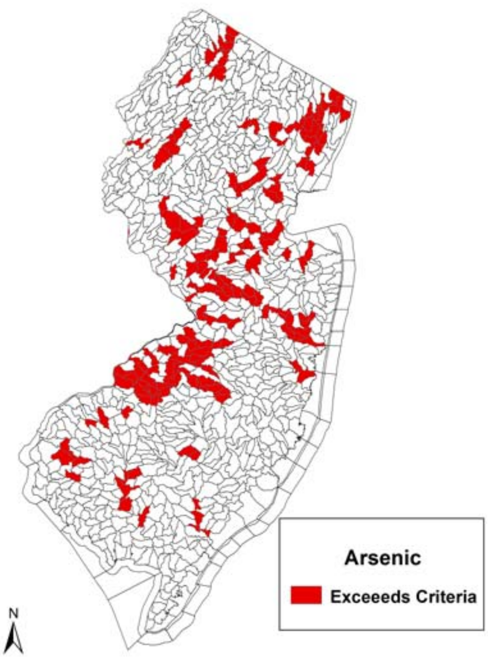


Figure 4.8-9: Arsenic Exceedances

Arsenic: A total of 154 AUs did not attain the drinking water use due to exceedances of the human health criterion for arsenic. The number of arsenic listings on the 303(d) List increased from 115 in 2006 to 154 in 2008 (see Figure 4.8-9). This net increase is generally attributable to data from previously unassessed waters and does not necessarily indicate a decline in water quality. Six AUs with arsenic exceedances were assigned to Sublist 4 of the Integrated List of Waters because TMDLs were already adopted for these waters. Only the Maurice River, which is not used for drinking water, had arsenic concentrations above the Safe Drinking Water MCL. Although the Department suspects that many of the arsenic exceedances are caused by natural sources, anthropogenic sources may also contribute to elevated concentrations (see Section 4.3 "Drinking Water Supply Use" for more details).

Priority Ranking and Two-Year TMDL Schedule

Section 303(d) of the federal Clean Water Act requires states to rank and prioritize the AU/pollutant combinations comprising the 303(d) List of Water Quality Limited Waters for development of total maximum daily loads (TMDLs). The goal of priority ranking is to focus available resources in the most effective and efficient manner, while taking into account environmental, social and political factors. The AU/pollutant combinations are ranked as high, medium, and low based on their relative priority for TMDL development. A detailed explanation of the ranking process can be found in Section 8 of the Methods Document. The 2008 303(d) List of Impaired Waters with Priority Ranking can be found in Appendix B.

Delisting Waters from the 303(d) List

There are numerous reasons for removing an AU/pollutant combination from the 303(d) List of Water Quality Limited Waters (i.e., "delisting"). USEPA has developed codes for general categories of reasons supporting delisting decisions. The delisting codes, descriptions, and definitions are summarized in Table 4.8-6 and explained in more detail in the 2008 Methods Document. The codes have been modified from those explained in the 2006 Methods Document to be consistent with the terminology used in USEPA's Assessment Database (ADB), explained later in this Report. All AU/parameter combinations that were on the 2006 303(d) List but are not on the 2008 303(d) List are identified along with the applicable delisting code in Appendix C: 2008 Integrated Report Delisting Document.

Table 4.8-6: Delisting Definitions

Delisting Code	Delisting Description	Delisting Definition
1	SWQS are met	**Delisting:** Applicable SWQS are being met because water quality has been restored.
2	Flaws in original listing	**Delisting**: Applicable SWQS are being met and the assessment unit/parameter combination was incorrectly listed in a previous 303(d) list.
3	TMDL Alternative (4b)	**Delisting but still impaired:** Assessment unit/parameter combination is not attained but development of a TMDL is not required because water quality will be restored by control measures for point and/or nonpoint sources.
4	Not caused by a pollutant (4c)	**Delisting but still impaired:** Assessment unit/parameter combination is not attained but development of a TMDL is not required since the cause is something other than a Clean Water Act pollutant, such as flow alteration.
5	TMDL approved or established by USEPA (4a)	**Delisting but still impaired:** Assessment unit/parameter combination is not attained but development of a TMDL is not required because a TMDL has already been approved or adopted by USEPA.
6	Waterbody not in State's jurisdiction	**Delisting:** Assessment unit/parameter combination was incorrectly included on a previous 303(d) List.
7	Other	Will be defined as needed.
8	Applicable SWQS met due to restoration activities	**Restoration:** Applicable SWQS are being met because water quality has been restored due to restoration activities.
9	Amended SWQS	**Restoration:** Applicable SWQS are being met due to amendments to the SWQS adopted since the previous assessment.
10	Applicable SWQS are met according to new assessment method	**Restoration:** Applicable SWQS are being met based on the results of a new assessment method.
11	Applicable SWQS are met; original basis for listing was incorrect	**Restoration:** Assessment unit/parameter combination is found to attain the applicable SWQS because the original basis for the decision was incorrect. (Examples: Natural conditions, flow- related decisions, narrative criteria compliance such as "Exit Ramp" studies)

Table 4.8-6: Delisting Definitions (continued)

Delisting Code	Delisting Description	Delisting Definition
12	Applicable SWQS met; no longer threatened	**Restoration:** New Jersey is not using this category**.**
13	Applicable SWQS met; reason for recovery unspecified	**Restoration:** Assessment unit/parameter combination is currently found to meet the applicable SWQS but the reason for water quality improvement is unknown**.**
14	Data and/or information lacking to assess compliance with the applicable SWQS - original basis for listing was incorrect	**Delisting:** Assessment unit/parameter combination was incorrectly included on a previous 303(d) List and there is insufficient information to assess compliance with applicable SWQS**.**

The 2008 Integrated Report Delisting Document identifies 487 delisted AU/pollutant combinations. Table 4.8-7 shows the individual delisted pollutants and the number of assessment units delisted with each pollutant, with the exception of lakes listed on the 2006 303(d) List. As explained in the 2008 Methods Document (Section 1.2), the Department integrated lake data with data from other stations within the same AU; therefore, these waterbody/pollutant combinations do not appear in the Delisting Document because the lake data was integrated into their corresponding AU for the 2008 Report. (Appendix L provides a List of Lakes and Corresponding Assessment Units.). Pathogen data for lakes was not used for the 2008 Integrated Report because the Department determined that lake pathogen data did not meet the Department's data quality requirements (see Methods Document, Section 3.1). Therefore, lake/pathogen combinations appearing on the 2006 303(d) List were delisted because of "data lacking to assess compliance with the applicable SWQS - original basis for listing was incorrect" (Code 14).

Table 4.8-7: Parameters Delisted From the 2006 303(d) List

Pollutants	Assessment Units	Pollutants	Assessment Units
Arsenic	3	Nickel	1
Cadmium	5	Pathogens	104
Cause Unknown	41	pH	103
Chlordane	1	Phosphorus	56
Chromium	6	TCE	3
Copper	12	Temperature	11
Dioxin	65	Total dissolved solids	4
Dissolved Oxygen	15	Total suspended solids	9
Lead	9	Turbidity	1
Mercury	36	Zinc	2
		TOTAL	**487**

Use of USEPA's Assessment Database (ADB):

The USEPA Assessment Database (ADB) is a relational database application for tracking water quality assessment data for thousands of waterbodies, such as use assessment results, causes and sources of non-attainment and impairment, and integrating it into meaningful reports. The ADB was designed to make reporting under Sections 305(b) and 303(d) of the CWA automated, accurate, straightforward, and user-friendly for participating States. USEPA uses another database for TMDL-related data and information. USEPA integrates the information collected through its TMDL and assessment databases and then provides this information to the public through "ATTAINS" (Assessment Total Maximum Daily Load Tracking and Implementation System). The Department's nomenclature did not always match that used in USEPA's databases. For this reason, the Department modified some of its nomenclature in developing the 2008 Integrated List of Waters and the 2008 303(d) List to be consistent with ADB. For example, instead of referring to pathogenic indicators collectively as "pathogens", the Department listed them individually (e.g., fecal coliform, *E. coli*, enterocci). Similarly, the Department listed DDT, DDE, and DDD individually rather than collectively as "DDx". All such nomenclature changes are explained earlier in this section and in the 2008 Methods Document (Appendix F).

New Jersey submitted its 2006 water quality assessment results to USEPA's consultants to populate ADB and ATTAINS. Most of the 2006 assessment results are now available on USEPA's ATTAINS Web site at http://www.epa.gov/waters/ir. The Department anticipates sending USEPA a copy of ADB populated with the 2008 assessment results in April 2009, pending USEPA approval of New Jersey's 2008 303(d) List. The Department will continue to provide the results of its water quality assessments to the public in report and table format as the Integrated Water Quality Monitoring and Assessment Report. The Integrated Reports will continue to include all the information submitted to USEPA for ATTAINS, including the use assessment results by sublist for all AUs (Appendix A: 2008 Integrated List), a list of all parameters causing non-attainment of the designated uses on Sublist 5 and their priority ranking for TMDL development (Appendix B: 2008 303(d) List of Water Quality Limited Waters), and a list of all delisted parameters and assessment units (Appendix C: 2008 Integrated Report Delisting Document).

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Chapter 5: Water Quality Management

5.1 Overview of Water Quality Management Programs

The New Jersey Department of Environmental Protection (Department) is dedicated to restoring, enhancing, and protecting the quality of New Jersey's natural environment, as well as ensuring equitable and beneficial uses of the State's waters. The policies expressed in the federal Clean Water Act; the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.; the New Jersey Water Quality Planning Act, N.J.S.A. 58:11A-1 et seq.; and the New Jersey Water Supply Management Act, N.J.S.A. 58:1A-1 et seq., provide the foundation for the environmental programs that protect New Jersey's waters. Other state laws also play important roles, including the Freshwater Wetlands Protection Act, N.J.S.A. 13:9B-1 et seq.; the Stormwater Management Act, N.J.S.A. 40:55D-93 through 99; the Watershed Protection and Management Act, N.J.S.A. 58:29-1 et seq.; the Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 et seq.; the Wetlands Act of 1970, N.J.S.A. 13:9A-1 et seq.; and the Coastal Area Facility Review Act, N.J.SA 13:19-1 et seq. New Jersey's Water Quality Management Programs extend beyond the traditional water pollution control programs identified in the federal guidance for the Integrated Report. Therefore, this chapter includes sections on watershed-based programs, water quality management planning, point source pollution control, nonpoint source pollution control, total maximum daily loads, and other programs that constitute Water Quality Management in New Jersey.

Watershed-based Programs:

The Department's Division of Watershed Management (Division) has primary responsibility for administering New Jersey's Statewide Watershed Management Program, including the Water Quality Management Planning Program, the Nonpoint Source Pollution Control Program, the Total Maximum Daily Load (TMDL) Program, and aspects of the Highlands Region Water Resources Protection Program. New Jersey's three National Estuary Programs are now administered by the Commissioner's Office. The Source Water Assessment Program, administered by the Department's Division of Water Supply, and the Coastal Zone Management Program, administered by the Department's Coastal Management Office, are also watershed-based but emerged from the federal Safe Drinking Water Act and the federal Coastal Zone Management Act, respectively, rather than the federal Clean Water Act. Chapter 5 contains individual sections that summarize each of these programs, with the exception of the Source Water Assessment Program, which is described under Chapter 6, Public Health Concerns, since it relates more directly to protection of drinking water quality for public health.

The goal of the Division of Watershed Management is comprehensive water resource management on a watershed basis. Towards that end, the Division applies a two-pronged approach. The first approach is designed to prevent water quality degradation. The Stormwater Management Rules (N.J.A.C. 7:8) and the Water Quality Management Planning Rules (N.J.A.C. 7:15) are implemented to achieve this goal. The second approach includes actions to remedy existing water quality problems. This effort employs nonpoint source pollution control (including federal Section 319(h) grant-funded projects), TMDLs, and watershed restoration. Information about these programs is provided under Chapter 5, Sections 5.5, 5.6, and 5.12, respectively.

Chapter 5: Water Quality Management

5.2 Statewide Water Quality Management Planning Program

The Department's Division of Watershed Management has primary responsibility for administering New Jersey's Statewide Water Quality Management Planning Program pursuant to the New Jersey Water Quality Planning Act (N.J.S.A. 58:11A-1 et seq.), the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.), and the Water Quality Management Planning rules (N.J.A.C. 7:15). The New Jersey Water Quality Planning Act (Act) was adopted in 1977 and provided the authority needed for New Jersey to implement sections 201, 208, and 303 of the Federal Clean Water Act. The purpose of the Act is to restore, maintain, and preserve the quality of the waters of the State, including both surface and ground water, for the protection and preservation of the public health and welfare, food supplies, public water supplies, propagation of fish and wildlife, agricultural and industrial uses, aesthetic satisfaction, recreation, and other beneficial uses. The Act endeavors to achieve this purpose by instituting a continuing planning process through the adoption of areawide Water Quality Management (WQM) plans, also known as "208 Plans", which coordinate and integrate water quality and wastewater management plans with related federal, state, regional, and local land use plans.

One component of the WQM plans is wastewater management plans (WMPs), which are adopted as amendments to the WQM plans. WMPs identify appropriate wastewater management measures to accommodate future development without degrading surface and ground water quality. WMPs contain written and graphic descriptions of existing and future wastewater-related jurisdictions, wastewater service areas, and selected environmental features and treatment works. According to the WQM Planning rules, the Department shall not undertake, or authorize through the issuance of a permit, any project or activity that affects water quality or conflicts with the applicable sections of adopted WQM plans or the WQM Planning rules. Total Maximum Daily Loads (TMDLs) are adopted as amendments to the WQM plans.

On May 20, 2008, the Department readopted the Water Quality Management Planning (WQMP) Rules at N.J.A.C. 7:15 with amendments that became effective on July 7, 2008. The amendments include reassignment of wastewater management planning responsibility to the County Boards of Chosen Freeholders; withdrawal and re-designation of wastewater service areas where the applicable wastewater management plan (WMP) is not in compliance with the mandatory update schedule contained in the rules; a requirement that updated WMPs address septic density in a manner that demonstrates compliance with a 2 mg/L (ppm) nitrate planning standard; and a requirement that municipalities pass an ordinance designed to assure septic system maintenance. The amendments also establish clear standards for delineating sewer service areas to protect environmentally sensitive areas as well as clear, environmentally protective standards for the review of WQM plan amendments. The latter include standards to address wastewater, water supply, nonpoint source pollution (including controls related to stormwater, riparian zones, and steep slopes), and habitat of threatened and endangered species.

Amendments to the Ground Water Quality Standards (GWQS) Rules at N.J.A.C 7:9C were adopted as a companion to the WQMP rule amendments. By amending the GWQS rule in conjunction with the WQMP rule, the Department is extending its antidegradation policy beyond

NJPDES-permitted facilities. Additional information about the Ground Water Quality Standards rules is provided under Chapter 5, Section 5.3.

Additional information about the Statewide Water Quality Management Planning Program is available on the Department's Web site at http://www.nj.gov/dep/watershedmgt/wqmps.htm.

Chapter 5: Water Quality Management

5.3 Water Quality Standards Program

The Bureau of Water Quality Standards and Assessment, in the Department's Water Monitoring and Standards Program, is responsible for promulgating New Jersey's surface and ground water quality standards (N.J.A.C. 7:9B and 7:9C, respectively), including waterbody classifications, designated uses, water quality criteria, and antidegradation policies. The New Jersey Water Quality Planning Act (N.J.S.A. 58:11A-1 et seq.) requires the State to maintain water quality in existing high quality waters and to restore water quality in impaired waters. The Department accomplishes this by developing and implementing Surface Water Quality Standards (SWQS) and Ground Water Quality Standards (GWQS) for New Jersey's waters.

Surface Water Quality Standards (SWQS):

The SWQS establish a stream classification and an antidegradation designation for all surface waters of the State. The stream classifications reflect the designated uses assigned to individual surface waterbodies. Designated uses include aquatic life support (maintenance, migration, and propagation), recreation, fish consumption, shellfish harvesting (for consumption), drinking water supply, industrial water supply, and agricultural water supply. The SWQS also specify the water quality criteria that correspond with the waterbody classifications, which are necessary to achieve the designated uses.

The SWQS also assign an antidegradation designation to each waterbody, which specifies to what degree a lowering of water quality may be authorized for a new or expanded activity. There are three antidegradation designations in the SWQS: Outstanding Natural Resource Waters (the most protective antidegradation designation), Category One Waters, and Category Two Waters. Outstanding Natural Resource Waters (ONRWs) are maintained in their natural state and are protected from manmade activities that might cause a change in water quality. ONRWs include freshwaters in preserved open spaces (FW1) and Pinelands (PL) waters. Category One Waters are protected from measurable changes in water quality. Category Two Waters may be subjected to a lowering of water quality to levels that still support all existing uses based upon a social and/or economic justification. All waters not specifically identified in the SWQS as ONRWs or Category One Waters default to the antidegradation designation of Category Two Waters.

The SWQS are utilized by the New Jersey Pollutant Discharge Elimination System (NJPDES) discharge to surface water permitting program in the development of water quality-based effluent limitations (WQBELs) to protect or improve the existing water quality and designated uses. The SWQS also contain policies on design flows, mixing zones, antidegradation, and nutrients, which specify how the surface water quality criteria are to be applied through NJPDES permits. The Department is required, pursuant to Section 303(d) of the federal Clean Water Act, to identify waters that do not meet SWQS after the implementation of technology-based effluent limitations, and to develop total maximum daily loads (TMDLs) to restore these impaired waters. The SWQS serve as water quality restoration targets to be achieved by TMDLs (see Chapter 5, Section 5.6 for information on the TMDL Program).

The SWQS are also utilized by the Department's Site Remediation Program to ensure that ground water remediation activities that discharge to surface waters comply with the SWQS. The Department's Division of Land Use Regulation, through the Freshwater Wetlands Program, the Coastal Permitting Program, and the Flood Hazard Area Control Program (formerly known as the Stream Encroachment Program) also utilizes the stream classifications and antidegradation designations adopted in the SWQS to regulate activities under these programs' respective jurisdictions.

All stream reclassifications and Category One designations occur through an administrative rulemaking process, affording the public an opportunity to comment and provide input into these decisions. The rule proposal must include a justification of why the stream is exceptional or otherwise supports the reclassification. The rule proposal is published in the New Jersey Register followed by a 60-day public comment period. During the public comment period, a public hearing is held to provide an opportunity for the public to present oral testimony. After the close of the public comment period, the Department evaluates the comments received and, if appropriate, proceeds to adoption. The upgraded stream classification and/or antidegradation designation is published as an adopted rule in the New Jersey Register along with the Department's responses to the public comments received. The new classification and/or antidegradation designation are effective when the rule appears in the New Jersey Register. The entire process takes approximately six to nine months.

Since 2002, the Department has proposed and adopted several rules amending the SWQS to upgrade stream classifications and/or antidegradation designations of the surface waters of New Jersey. On June 16, 2008, the Department adopted amendments to the SWQS that include new Category One upgrades as well as a revised definition of "Category One waters" and new definitions for the terms "exceptional ecological significance", "exceptional fisheries resource(s)", and "exceptional water supply significance". These terms are part of the Category One Waters definition, which was revised to better define the qualifications necessary for waters to be considered for upgrade to Category One designation, as well as the data necessary to evaluate these qualifications. The amended definitions will help the Department and the public identify waters that are truly exceptional and appropriate for upgrade to Category One designation. As a result of all these amendments, more than 29 percent of New Jersey's waters are currently designated as Category One, including several water supply reservoirs. Details on these rule amendments, as well as maps of the Category One waters, may be viewed on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/rule_archives.htm.

Ground Water Quality Standards:

The Ground Water Quality Standards (GWQS) establish ground water classifications and antidegradation policies for all ground waters of the State. The GWQS specify the water quality criteria and designated uses for ground water in New Jersey. The criteria are numeric values assigned to ground water constituents (i.e., pollutants) and implemented to protect the ambient ground water quality and associated designated uses. The GWQS also contain technical and general policies to ensure that the designated uses are protected.

Under the GWQS, ground water is classified according to its hydrogeologic characteristics and designated uses. Ground water within watersheds of FW1 surface waters, state-owned Natural Areas, and the major aquifers of the Pinelands Region, are designated as Class I ground waters**.** The designated use for Class I ground waters is the maintenance of special ecological resources. Secondary uses include potable, agricultural, and industrial water supply. The designated use of Class II ground waters is to provide potable water supplies using conventional treatment. Both existing and potential potable water supply uses are included. Class II criteria specify the levels of constituents above which the water would pose an unacceptable risk for drinking water. Class II includes all areas that are not designated as Class I or Class III. Class III ground waters can be used for anything other than potable water. Most ground waters of the State fall under the Class II-A designation, whose primary designated use is potable water supply and conversion to potable water supply.

The GWQS serve as the basis for setting ground water discharge standards under the NJPDES Discharge to Ground Water Permit Program (see Chapter 5, Section 5.4), and for establishing remediation standards for ground water cleanups under the Site Remediation Program. Other relevant programs using the GWQS include, but are not limited to, those implemented pursuant to the Spill Compensation and Control Act, Solid Waste Management Act, Industrial Site Recovery Act, Underground Storage of Hazardous Substances Act, Realty Improvement Sewerage and Facilities Act, and Pesticide Control Act of 1971.

The specific ground water quality criteria and practical quantitation levels (PQLs) for Class II-A ground waters are found in Appendix Table 1 of the GWQS rules at N.J.A.C. 7:9C. They are also posted on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/gwqs_table1.html. PQLs are defined at N.J.A.C. 7:9C-1.4 as the lowest concentration of a constituent that can be reliably achieved among laboratories within specified limits of precision and accuracy during routine laboratory operating conditions. There are instances when the health-based criterion for a particular constituent cannot be quantified by certified methods. In these cases, the GWQS criterion is set at the PQL. The Department can also establish interim specific ground water quality criteria for constituents for which health-based criteria do not yet exist in the GWQS. In addition, where the Department believes that the existing specific ground water quality criteria found in Appendix Table 1 should be updated based on new scientific information available on the USEPA Integrated Risk Information System database (IRIS), the Department may administratively update the criteria. New specific ground water quality criteria for two constituents, barium and toluene, were established through administrative change to the GWQS rules, which became effective on July 27, 2007.

Interim specific criteria are posted, along with their associated PQLs and related support documentation, on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/gwqs_interim_criteria_table.htm as they become available, along with any interim generic criteria that are reevaluated but for which sufficient information is not available to develop an interim specific criterion. Interim generic criteria are posted in Appendix Table 2 at http://www.state.nj.us/dep/wms/bwqsa/gwqs_table2.html. New interim specific ground water quality criteria were established by the Department for fourteen constituents on February 8, 2008. Four other constituents were also evaluated for interim specific criteria but remain subject to interim generic criteria due to lack of sufficient scientific information.

On July 7, 2008, the Department adopted amendments to the GWQS antidegradation policy. The adopted amendments to the GWQS Rules delete the antidegradation limits established at existing N.J.A.C. 7:9C-1.8(b) through (e) and replace them with new implementation procedures at proposed N.J.A.C. 7:9C-1.8(b)1 through 5, which establish the water quality conditions to be maintained that correspond with the different ground water classifications and their designated uses. The amended rule prohibits any new or expanded discharge to ground water in the Highlands Preservation Area that is not in conformance with the Highlands Water Protection and Planning Act Rules at N.J.A.C. 7:38. In addition, the new antidegradation policy applies equally to Class II and Class III ground water, to protect existing ground water quality from significant degradation.

The new GWQS rule was adopted as a companion to the amended Water Quality Management Planning (WQMP) rules at N.J.A.C. 7:15. By amending the GWQS rule in conjunction with the WQMP rule, the Department is extending its antidegradation policy beyond NJPDES-permitted facilities. For discharges to ground water from domestic treatment works, evaluation of compliance with the proposed antidegradation policy will be conducted at two scales. A regional evaluation will be conducted through the WQMP process. Evaluation on a regional scale will allow for consideration of secondary and cumulative impacts on a watershed (i.e., HUC 11) basis, such as from a large-scale development. Placement of the proposed domestic treatment works will not be addressed in the regional evaluation. Therefore, once the regional evaluation has been completed, a site-specific evaluation will also be required, through the NJPDES discharge to ground water permitting process pursuant to existing N.J.A.C. 7:14A, to demonstrate that the permitted discharge would maintain existing ground water quality that is better than criteria. The Department will use nitrate as a surrogate for the constituents in domestic wastewater, and has determined that 2 mg/L nitrate is representative of existing ground water quality statewide. Under the new rule, new and expanded domestic treatment works that discharge to Class II and Class III ground water are required to demonstrate compliance with the antidegradation policy by maintaining 2 mg/L nitrate over the HUC 11 watershed and by maintaining 6 mg/L nitrate over the property served by the wastewater treatment facility.

Intra-Departmental Standards Coordination Committee:

An intra-departmental committee was convened for the purpose of ensuring department-wide consistency for human health-based standards. The goals of this work group are to understand the process of standard development that each affected program follows in the development of new standards or the modification of existing standards and to develop a process to ensure as much consistency as possible, where appropriate. To date, the Work Group has developed a Standard Operating Procedure for the internal coordination of the request and development of new ground water quality criteria and PQLs. The Work Group has also established new interim specific ground water quality criteria for fourteen constituents and evaluated four more that remain as interim generic criteria. The Work Group is presently developing a master list of all health-based standards used by the Department (except air quality standards) and will be comparing them for consistency and possible promulgation of new or revised standards.

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5.4 Water Pollution Control Programs (NJPDES)

The discharge of pollutants to waters of the State is regulated by the Department under the authority of the New Jersey Water Pollution Control Act (WPCA), N.J.S.A. 58:10A. The WPCA specifies, "No person shall discharge any pollutant except in conformity with a valid NJPDES permit." The Department's Division of Water Quality implements the New Jersey Pollutant Discharge Elimination System (NJPDES) Program pursuant to the NJPDES regulations at N.J.A.C. 7:14A. The NJPDES Program protects New Jersey's ground and surface water quality by assuring the proper treatment and discharge of wastewater (and its residuals) and stormwater from various types of facilities and activities. To accomplish this, permits are issued limiting the mass and/or concentration of pollutants that may be discharged into ground water, streams, rivers, and the ocean. The types of regulated facilities can range from very small dischargers, such as campgrounds, schools, and shopping centers, to larger industrial and municipal wastewater dischargers.

Discharge to Surface Water Permits:

The Division of Water Quality's Bureaus of Point Source Permitting Regions 1 and 2 regulate facilities discharging domestic and industrial wastewater directly into surface waters of the State as part of the NJPDES program, under the additional authority of the federal Clean Water Act delegated to New Jersey by USEPA to implement the National Pollutant Discharge Elimination System (NPDES). The regional structure of the two bureaus was established to facilitate watershed-based permitting. The regional boundaries are based on New Jersey's 20 watershed management areas and 5 water regions. Region 1 includes the Upper Delaware and Passaic Regions and the northern portion of the Atlantic Coastal Region. Region 2 includes the Raritan and Lower Delaware Regions and the southern portion of the Atlantic Coastal Region. Permittees include various industries; federal, state, county, and municipal facilities; private companies; private residential developments; hospitals; and schools. Collectively, the facilities regulated by these bureaus serve the wastewater treatment needs of millions of people and hundreds of industries. The two bureaus also evaluate water quality, biological, and toxicological analyses as well as thermal impact and cooling water assessments that have been submitted to the Department by applicants and permittees.

In Fiscal Year 2003, USEPA worked with states to develop the "Permitting for Environmental Results Strategy" (PERS) to address concerns about the backlog in issuing permits and the effectiveness of state NPDES programs. The Strategy focused limited resources on the most critical environmental problems and addressed program efficiency and integrity. USEPA is currently working with states to structure their permit programs to better support comprehensive protection of water quality on a watershed basis. Some key elements of this effort include expedited issuance of high priority permits. Each year, USEPA and states define a subset of permits that have high environmental priority, including permits needed to support TMDLs and watershed plans. USEPA has asked states to develop schedules for issuing these permits and assure that 95% of such permits are issued that year. Since the program's inception, the Department has achieved 100% compliance with the PERS permit-issuance goals.

In New Jersey, "high priority" point source permits considered candidates for the year's PERS list are as follows:

1) All major permits that have been expired for more than 2 years;

2) Minor permits that have been expired for more than 2 years and either discharge into Category One waters or discharge into waters listed as impaired on New Jersey's List of Water Quality Limited Waters.

On December 18, 2006, the Department adopted amendments to the NJPDES rules that require major facilities discharging to polychlorinated biphenyl (PCB) -impaired waters to monitor their receiving waters for PCBs using method 1668A (see 37 N.J.R. 4723(a)). Based on the results of the monitoring, some facilities will be required to develop and implement a PCB Pollutant Minimization Plan (PMP). Since PCBs are no longer used in industrial processes, the Department expects that most pollutant loading will likely be from contaminated areas around the dischargers' facilities, either from old leaky equipment or from production of PCBs as an unwanted by-product. The PMP will lead to the identification and elimination of those discrete sources of PCBs. Technical Guidance for PCB PMPs is available on the Department's Web site at http://www.state.nj.us/dep/dwq/techmans/pcb_pmp_techman.pdf.

On October 1, 2007, the Department adopted a new rule targeted at reducing the levels of mercury discharged to POTWs. The adopted amendments to the NJPDES rule, entitled "Requirements for Dental Facilities" at N.J.A.C. 7:14A-21, were published at 39 NJR 4117(a). The new rule will reduce mercury discharge from dental facilities. Dental facilities contribute as much as 35 to 45 percent of the mercury entering publicly-owned treatment works (POTWs). Mercury from these facilities results from dental amalgam (approximately 50 percent mercury by weight) being rinsed down the drain, where it usually enters a municipal wastewater system, and then enters the POTW, which are often not equipped to treat wastewater for such heavy metals. Mercury not removed by the POTW's treatment process is discharged into the surface waters of the State. Mercury that is removed at the POTW by wastewater treatment is concentrated in sludge that may be incinerated, which releases the mercury into the air where it can be deposited into surface waters. Therefore, reducing/eliminating the amount of mercury entering POTWs from dental amalgam will reduce the amount of mercury entering surface waters.

Under most circumstances, the new rule will exempt a dental facility from the requirement to obtain an individual permit for its discharge to a POTW if it implements dental amalgam best management practices (BMPs) listed in the new rule and installs and properly operates an amalgam separator. These measures should prevent about 99 percent of the mercury-containing wastes from dental facilities being sent to the POTW. Dental facilities were given one year (by October 1, 2008) to implement the required BMPs and two years (by October 1, 2009) to install the separator. To determine the effluent base line levels of mercury discharged from the State's sewage treatment plants, the Department began requiring dischargers to conduct effluent testing for mercury using EPA method 1631E both before and after implementation of the Dental Rule, to better ascertain the impact of this rule and determine if further actions need be undertaken. Technical guidance for this monitoring is available on the Department's Web site at http://www.nj.gov/dep/dwq/pdf/Mercury_Monitoring_Guidance.pdf. Additional information on the Dental Rule is available on the Department's Web site at http://www.nj.gov/dep/rules.

On March 17, 2008, the Department proposed amendments to the NJPDES rules and the Standards for Individual Subsurface Sewage Disposal Systems rules, N.J.A.C. 7:9A, the Water Pollution Control Act rules, N.J.A.C. 7:14, the Ninety-Day Construction Permit rules, N.J.A.C. 7:1C, and the Department Organization rules at N.J.A.C. 7:1. The most extensive amendments to the rules pertain to reclaimed water for beneficial reuse; the method for calculating the fee for dischargers to ground water; the fee for authorizations under the stormwater construction general permit; residuals management; the effluent standard for acute whole effluent toxicity; and the industrial pretreatment program. The public comment period for these rules closed on May 16, 2008 (for more information, see the Department's Web site at http://www.nj.gov/dep/rules/).

Discharge to Ground Water Permits:

The Division of Water Quality's Bureau of Nonpoint Pollution Control regulates facilities that discharge sanitary and industrial wastewater to ground water. The pollution control requirements contained in NJPDES ground water discharge permits are those conditions necessary to restrict the discharge of pollutants to ground waters of the State and to protect the public health and the environment.

The types of discharge activities that are regulated by the NJPDES program include surface impoundments, infiltration/percolation lagoons, overland flow systems, spray irrigation systems, and various types of subsurface disposal systems that are classified as underground injection systems. The types of facilities regulated include: mines, pits and quarries; schools and hospitals; potable water treatment plants; large corporate office buildings; industrial manufacturing facilities; campgrounds and mobile home parks; food processors; and sewage treatment plants and other discharges of wastewater that can impact ground water, including the management of dredged materials at upland locations. Additional information about the NJPDES Discharge to Ground Water Permitting Program is available on the Department's Web site at http://www.state.nj.us/dep/dwq/dgw_home.htm.

The Department's Site Remediation Program regulates discharges from past activities, such as spills, or from non-operating or closed landfills, Underground Storage Tanks, and contaminated sites. These discharges are remediated or controlled by Memoranda of Agreement (MOAs) or voluntary cleanup agreements authorized by the Site Remediation and Waste Management Programs. Additional information about the Department's Site Remediation and Waste Management Programs is available on the Department's Web site at http://www.state.nj.us/dep/srp/.

Underground Injection Control:

The Division of Water Quality's Bureau of Nonpoint Pollution Control coordinates the Underground Injection Control (UIC) Program for New Jersey. Underground injection systems include a number of different types of subsurface disposal systems such as: sanitary septic systems that do not conform to the Standards for the Construction of Individual Subsurface

Sewage Disposal Systems (N.J.A.C. 7:9A), any septic system receiving industrial wastewater, true wastewater injection wells, subsurface trench systems, dry wells, seepage pits, etc. In New Jersey, the UIC program is managed under the umbrella of the NJPDES Discharge to Ground Water Program described above. Additional information about the UIC Program is available on the Department's Web site at http://www.state.nj.us/dep/dwq/dgw_home.htm.

Residuals, Biosolids, Sewage Sludge:

Residuals are generated by both domestic treatment plants (sewage sludge) and industrial treatment plants (industrial residuals). Residuals are managed in a variety of ways, including the development of Marketable Residuals Products (often referred to as biosolids) used to fertilize or condition the soil. Examples include pellets, compost, and alkaline materials. Residuals are also incinerated in New Jersey and managed in a variety of ways at out-of-state facilities. Beneficial use of residuals as a fertilizer or soil conditioner is regulated under a NJPDES permit issued by the Division of Water Quality's Bureau of Pretreatment and Residuals and may require site-specific approvals, depending upon the nature of the residual. Incineration of residuals is regulated under New Jersey's Air Pollution Control Program (see the Department's Web site at http://www.nj.gov/dep/aqpp/). Residuals managed in other states are regulated by the receiving state.

The Bureau of Pretreatment and Residuals also oversees the Statewide Sludge Management Plan (a component of the Statewide Solid Waste Management Plan), reviews and approves long-term generator residuals management plans. Through the implementation of the Sludge Quality Assurance Regulations (N.J.A.C. 7:14C), residuals generators must test their residuals and report the results to the Department on a regular basis. This data is available to assure compliance with the appropriate residuals management criteria in much the same way that the surface water program uses effluent data to assure compliance with wastewater discharge requirements. Additional information about residuals management is available on the Department's Web site at http://www.state.nj.us/dep/dwq/bpr.htm.

Significant Industrial Users:

Some industrial dischargers do not discharge their wastewater directly into a surface waterbody like a stream or river, but rather discharge into a sanitary sewer system or sewage treatment plant. The wastewater is transported to a local agency's treatment plant where it is treated and usually discharged into a river or stream. These dischargers are known as "indirect users." Although not all indirect users require individual NJPDES permits, all must comply with at least minimum regulatory requirements under N.J.A.C. 7:14A-21.2. When this type of discharge meets one or more specific criteria, the discharger becomes a significant indirect user (SIU), and requires a permit. The criteria include discharging from specific operations, discharging high strength or high volume wastewaters, being subject to Federal Categorical Pretreatment Standards, and failure to comply with regulatory requirements under N.J.A.C. 7:14A-21.2.

SIUs are important from a regulatory standpoint because the wastewater they produce is often much stronger than the normal domestic sewage generated by residential uses. As a result, improperly pretreated wastewater from an SIU may upset the biological processes of a treatment plant, which could cause the discharge of improperly treated wastewater that then pollutes the receiving waterbody, and it could contaminate the sludge to a level where it is unsuitable for beneficial reuse. If not regulated properly, an SIU's wastewater may also create hazardous conditions in a sewage collection system and at a treatment plant. Each local agency must develop local limits in accordance with USEPA Guidance to protect the plant, or demonstrate why local limits are not necessary.

The Department issues permits for SIUs discharging to POTWs. The Department may grant "delegated" status to a local agency that demonstrates to the Department that it has the legal authority, procedures, and resources to adequately administer an SIU permitting program, as required under the Federal Pretreatment Program (40 CFR 403) and NJPDES regulations. Such a program requires both setting appropriate discharge limits for SIUs and enforcing those limits to ensure compliance. Once a pretreatment program has been delegated to a local agency, SIU permits are no longer issued by the Department in that service area.

The Division of Water Quality's Bureau of Pretreatment and Residuals is responsible for overseeing the administration of local agencies' delegated pretreatment programs as well as for issuing SIU permits for discharges into treatment works where local agencies do not have delegated pretreatment programs. Annual reports are required to be submitted by local agencies indicating the status of dischargers to POTWs and of the local agency's pretreatment program. This Bureau, along with the Bureau of Point Source Permitting, is responsible for implementing the "Dental Rule", described earlier, that will reduce mercury discharge from dental facilities. Additional information on the new dental rule is available on the Department's Web site at http://www.nj.gov/dep/rules.

Combined Sewer Overflow Program:

Combined Sewer Systems (CSSs) are wastewater collection systems designed to carry sanitary sewage, industrial and commercial wastewater, and stormwater runoff in a single system of pipes to a publicly owned treatment works (POTW). During dry weather, all flow (composed primarily of sanitary sewage and industrial/commercial wastewater) is conveyed to the POTW for treatment and disposal. During periods of rainfall or snowmelt, the total wastewater flows entering the collection system can exceed the capacity of the system or the treatment facility. Under such conditions, CSSs are designed to overflow at predetermined Combined Sewer Overflow (CSO) Points and result in discharges of excess wastewater flows, known as Combined Sewer Overflows (CSOs), directly to surface waterbodies such as rivers, estuaries, and coastal waters.

CSO discharges contain raw sewage consisting of a combination of untreated human waste and pollutants discharged by commercial and industrial establishments. CSOs also have a significant stormwater component that includes pollutants from urban and rural runoff. The pathogens, solids, and toxic pollutants carried by CSOs may be discharged directly to the waters of the State during wet weather events. CSOs are a human health concern because they can create the potential for exposure to disease-causing pathogens including protozoa, bacteria, and viruses. Exposure to CSO contaminants through swimming or other contact can lead to infectious diseases such as hepatitis, gastrointestinal disorders, dysentery, and swimmer's ear infection.

Other forms of bacteria can cause typhoid and cholera. Human health can also be affected by ingesting fish or shellfish contaminated by CSO discharges.

CSOs are point sources subject to NPDES permit requirements, including both technology-based and water quality-based requirements of the federal Clean Water Act (CWA). The National Combined Sewer Overflow Control Policy (National Policy) requires CSO permittees to develop Combined Sewer Overflow Long Term Control Plans (CSO-LTCPs) that include the evaluation of alternatives for attaining compliance with the CWA, including compliance with surface water quality standards and protection of designated uses of waters of the state. The objectives of the National Policy are to ensure that if CSOs occur, they result only from wet weather; bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the CWA; and minimize water quality, aquatic biota, and human health impacts from CSOs. The overall planning approach outlined in the National Policy consists of three major steps: system characterization; development, and evaluation of alternatives; and selection and implementation of controls.

The Department is implementing a Statewide Combined Sewer Overflow Control Program in a phased approach. Pursuant to the National Policy, owners and/or operators of CSSs are required to develop and implement Nine Minimum Control Measures (NMCs). The NMCs are technology-based best management practices that can be readily implemented to reduce CSOs and their effects on receiving waters. In the first phase of New Jersey's program, initiated in 1990, the Department required permittees to develop and implement solids/floatables control measures, to identify and eliminate dry weather overflows, and to document the implementation of NMCs. As of September 2007, 70% of the planned solids and floatables control facilities have been constructed and are operating. The operating control facilities have captured and removed about 600 tons of solids and floatables materials during calendar year 2006. (See Chapter 5.5, Floatables Control, for other floatables control programs implemented by the Department.)

The Department also initiated the development of system characterizations or land-based models of the CSSs. In the second phase of the State's CSO Program, the Department requires permittees to evaluate the feasibility of effecting pathogen controls. Permittees are also required to quantify the expected removal of other pollutants that may occur incidental to the control of pathogens. These evaluations may be integrated with the TMDL process (see Chapter 5, Section 5.6), where appropriate, to develop wasteload allocations for CSOs, establish discharge requirements and/or to support Use Attainability Analysis and Surface Water Quality Standards Reviews. To date, three permittees have separated combined sewer systems and eliminated the CSO points. Additional information on New Jersey's CSO Program is available on the Department's Web site at http://www.state.nj.us/dep/dwq/gp_cso.htm.

Stormwater Permitting Program:

The Stormwater Permitting Program was mandated by Congress in the 1987 amendments to the federal Clean Water Act under Section 402(p). Consistent with the corresponding federal regulations, New Jersey's Stormwater Permitting Program is divided into two sections: Industrial Stormwater Permitting ("Phase I") and Municipal Stormwater Regulation ("Phase II"). Both programs emphasize pollution prevention techniques and source control rather than "end-of-pipe" treatment. Implemented primarily through the issuance of individual permits and innovative general permits, the stormwater permitting program is the Department's most ambitious effort in making pollution prevention part of the permitting process. New Jersey's stormwater permitting program relies primarily on pollution prevention through the development, implementation, and maintenance of Stormwater Pollution Prevention Plans. These plans stress the development of reasonable and cost effective best management practices (BMPs) that eliminate or minimize the contact between source materials and stormwater, preventing pollution and saving industry money by reducing inventory and material losses.

Industrial Stormwater Permitting Program (Phase I):

USEPA defined eleven categories of industry that may be subject to regulation under the Phase I Industrial Stormwater Permitting Program. All subject facilities must apply for or have a NJPDES permit for stormwater discharge unless all of the facility's stormwater is combined with other wastewater and discharged to a POTW, or is discharged to a wastewater treatment plant that has a NJPDES Permit. Industrial stormwater permits include basic industrial stormwater general permits, industry-specific stormwater general permits and individual industrial stormwater permits. The large majority of regulated industrial facilities currently permitted by the Industrial Stormwater Permitting Program are authorized under one of several General Permits, including industry-specific General Permits or the Basic Industrial Stormwater General Permit (NJ0088315). In general, facilities are eligible for authorization under the Basic general permit if exposure of all industrial materials, activities or source materials to stormwater can be eliminated through the implementation of BMPs during an 18-month period. Facilities not eligible for an industrial stormwater general permit must obtain an individual industrial stormwater discharge permit from the Department.

How a facility will eliminate or minimize contact of source materials with stormwater is usually described in a Stormwater Pollution Prevention Plan (SPPP). For the Basic Industrial Stormwater General Permit, the SPPP is a simple plan that calls for removing pollutants from contact with stormwater. Many of the pollution prevention techniques discussed in the guidance manual may already be practiced at the regulated facility. Many companies that have implemented their SPPP have found that the cleaner and more organized work area needed to prevent stormwater contamination resulted in more efficient, safer, and cost-effective operations.

Individual NJPDES permits are issued to facilities that cannot eliminate exposure of pollutants to stormwater. These facilities have to develop and implement SPPPs to minimize or eliminate contact between pollutants and stormwater as well as comply with other permit conditions, such as monitoring stormwater discharges for pollutants. In some cases, effluent limitations may be imposed on the industrial stormwater discharge. Additional information about industrial stormwater discharges is available on the Department’s Web site at http://www.state.nj.us/dep/dwq/ispp_home.html.

Municipal Stormwater Regulation Program (Phase II):

The Municipal Stormwater Regulation Program addresses pollutants entering waters of the State from many storm drainage systems owned or operated by local, state, interstate, or federal government agencies. USEPA regulations refer to these systems as "municipal separate storm sewer systems" or "MS4s." This Program regulates, typically under NJPDES stormwater general permits, all 566 municipalities within the State, as well as public complexes and highway systems. A report summarizing the status (from 2004 through 2007) of compliance with these stormwater general permits is available on the Department's Web site at http://www.nj.gov/dep/dwq/msrp-report.htm.

Municipalities within the State are designated as either Tier A or Tier B municipalities. Tier A municipalities are generally located within the more densely populated regions of the State, or along or near the coast. Tier B municipalities are generally more rural and in non-coastal regions. Public complexes include large, publicly-owned, or operated military bases, colleges, and hospital complexes. Highway systems include those operated by counties or by transportation agencies such as the New Jersey Department of Transportation, Port Authority of New York and New Jersey, New Jersey Expressway Authority, and the South Jersey Transportation Authority. The general permits issued for these stormwater discharges address stormwater quality-related issues associated with new and existing development and redevelopment by requiring the preparation of a stormwater management program and implementation of specific permit requirements referred to as Statewide Basic Requirements.

Statewide Basic Requirements (SBRs) address stormwater quality issues related to new and existing development and redevelopment by requiring the preparation of a stormwater management program and implementation of specific permit requirements. All permittees are required to develop and adopt stormwater management programs for new development. All but Tier B municipalities are required to develop stormwater pollution prevention plans (SPPPs). New development and redevelopment are addressed, in part, by requiring municipalities to adopt and enforce a municipal or regional stormwater management plan and ordinance in accordance with the Department's Stormwater Management Rules at N.J.A.C. 7:8. In addition, permittees must develop public education programs and waste disposal controls for existing developed areas. The Tier B Permit (rural areas) concentrates on new development and redevelopment projects and public education. The Tier A Permit (urban areas) includes the requirements found in the Tier B Permit, as well as BMPs aimed at controlling stormwater pollutants from existing development.

Between April 1, 2005 and April 1, 2006, SPPPs were submitted for 97% of the applicable municipalities, 91% of the regulated highway agencies, and 86% of the regulated public complexes. Implementation of the street sweeping BMP by these agencies resulted in approximately 360,000 miles of roads swept and the removal of 170,000 tons of material. Implementation of the catch basin cleaning BMP resulted in the inspection and cleaning of approximately 205,000 catch basins and the removal of over 13,000 tons of material. Implementation of these two BMPs alone resulted in the removal of over 183,000 tons of material in one year that would otherwise have been discharged via storm sewers to waters of the State.

New Jersey's municipal stormwater regulations differ in some aspects from USEPA's Phase II stormwater rules. New Jersey's general permits are intended to be prescriptive regarding the implementation of BMPs, providing minimum standards, measurable goals, and implementation schedules for each category of stormwater discharge. The Department believes that this will ensure a consistent approach to stormwater management statewide, reduce costs for regulated entities, and provide a simple process for requesting authorization. Additional information about the Municipal Stormwater Regulatory Program, including the Stormwater Management Rules and the Stormwater BMP Manual, is available on the Department's Web site at http://www.njstormwater.org/.

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5.5 Nonpoint Source Pollution Control Programs

Nonpoint source (NPS) pollution is caused by precipitation moving over and through the land and carrying natural and synthetic pollutants into surface and ground water. Much progress has been made in controlling point source discharges of pollutants since the enactment of the federal Clean Water Act. However, due to its ubiquitous nature, progress in controlling NPS pollution has lagged behind. The Department estimates that between 40 and 70 percent of pollutant loads emanate from nonpoint sources.

NPS pollution cannot always be traced back to a single point: it is diffuse in origin, can emanate from anywhere in the watershed and is most often the result of human activity. NPS pollution may include chemicals and pathogens carried into streams by rainfall, such as oil and grease from roadways and parking lots; fertilizers from lawns, golf courses, and agricultural fields; and bacteria from improperly maintained septic systems, pet waste, and large congregations of waterfowl. However, NPS pollution can also include impacts not typically thought of as pollution, such as increased water temperature resulting from the clearing of streamside vegetation, or significant changes in the hydrology of the stream resulting from either increased stormwater runoff, which can erode the stream bed and banks, or the loss of water in the stream during dry weather resulting from the loss of recharge in a watershed under development and/or increased water withdrawals within a water supply watershed. Because of the diffuse and intermittent nature of nonpoint sources of pollution, traditional monitoring and permitting approaches are not as effective as they are for point sources.

Addressing NPS pollution requires a comprehensive control strategy that includes source identification, establishment of best management practices, public education, and cooperation among many levels of government and the local community. That strategy is articulated in the "State of New Jersey Nonpoint Source Report, 2007 Update" (April 2007). Additional information about the Department's NPS Program, and the 2007 Update, is available on the Department's Web site at http://www.nj.gov/dep/watershedmgt/nps_program.htm and in this Chapter under Section 5.7 Coastal Management Program.

Section 319(h) Nonpoint Source Pollution Control Grants:

Since 1990, Congress has annually appropriated monetary grants to states under Section 319(h) of the federal Clean Water Act to assist in implementing programs to control NPS pollution. The majority of the 319(h) funds received by the State of New Jersey are passed through to eligible entities to implement NPS pollution control projects. The Department's Division of Watershed Management administers New Jersey's 319(h) Grant Program. While early projects focused on streambank restoration, projects that are more recent focus on developing and implementing watershed-based plans (i.e. plans that are regional or area-wide in scope rather than a study of one location). The Department awarded $4,877,551 in Section 319(h) grant funds for 16 projects in state fiscal years (SFY) 2004 and 2005 (see Appendix K).

For SFY 2006, the Department solicited projects to develop Watershed Restoration and Protection Plans and Watershed-based Plan Implementation Projects. Funding in this grant cycle focused primarily on the implementation of Department-approved watershed-based plans as well as the continued development of Watershed Restoration and Protection Plans in targeted watersheds. Watershed Restoration and Protection Plans are designed to identify specific measures to be taken to restore impaired waters and to protect and maintain unimpaired waters. Funding priority is given to the development of Watershed Restoration Plans for waterbodies listed as impaired on Sublist 5 of the 2006 Integrated Report, or containing waters designated or proposed to be designated as Category One waters. Additional information about New Jersey's Section 319(h) NPS Grant Program is available on the Department's Web site at http://www.nj.gov/dep/watershedmgt/nps_program.htm.

Stormwater Management:

The Stormwater Management rules (N.J.A.C. 7:8) provide the basis for municipalities to develop stormwater management plans and specify stormwater management standards that are mandatory for new major development. The rules also amend the requirements contained in the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21-1.1 and establish new requirements for permits issued by the Department's Division of Land Use Regulation. The New Jersey Stormwater Best Management Practices Manual (BMP manual) has been developed to provide guidance to review agencies and the regulated community on complying with the standards in the Stormwater Management rules. The BMP manual is available through the Department's Web site at njstormwater.org.

The Stormwater Management rules also establish performance standards for ground water recharge to increase the integrity of the State's aquifers and protect dry weather base flow in streams. The rules require that 100 percent of the average annual ground water recharge be maintained for new development projects, to help mitigate future droughts and flooding. For the most part, these requirements are waived in urban areas. In addition to recharge standards, the rules promote smart growth techniques by requiring consideration of non-structural design methods for stormwater management. These include maintaining natural vegetation, reducing unnecessary loss of trees, minimizing existing drainage surfaces, preventing large contiguous areas of impervious surfaces, and maintaining existing drainage characteristics and patterns. Consideration of these techniques will require that stormwater management be considered early in the project design and not as a secondary concern. Once nonstructural measures have been fully integrated into the site design, any remaining water quality concerns must be addressed through the use of best management practices to reduce runoff of total suspended solids (TSS) by 80 percent and other pollutants up to the maximum extent feasible.

One of the most significant provisions of the Stormwater Management rule is the requirement for a 300-foot buffer to minimize the impact of stormwater runoff from new major development along a Category One (C1) waterbody. The rules also apply the buffer to tributaries of C1 waterbodies within the immediate watershed boundary that are not themselves designated C1 waterbodies. The Stormwater Management rules provide some flexibility on the size of the buffers in areas where regional stormwater management plans have been approved and for minor disturbances around existing and some prior-approved development within the 300-foot buffer.

Additional information about the Stormwater Management rules is available on the Department's Web site at http://www.njstormwater.org.

Concurrent with the Stormwater Management rules, the Department also promulgated new rules to facilitate implementation of the Municipal Stormwater Regulation Program, pursuant to USEPA's Phase II Stormwater Rules published in December 1999. The Municipal Stormwater Regulation Program addresses pollutants entering waters of the State from many storm drainage systems owned or operated by local, state, interstate, or federal government agencies. USEPA regulations refer to these systems as "municipal separate storm sewer systems" or "MS4s". For a complete description of New Jersey's Stormwater Permitting Program, see Chapter 5, Section 5.4.

Coastal Nonpoint Source Pollution Control Program:

The Coastal Nonpoint Source Pollution Control Program (Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990) addresses NPS pollution in coastal waters. This program is administered jointly by the US Environmental Protection Agency (USEPA) and the National Oceanic and Atmospheric Administration (NOAA). Section 6217 requires the 29 states and territories with approved Coastal Zone Management Programs to develop Coastal Nonpoint Pollution Control Programs (CNPCP). A CNPCP describes how a state will implement NPS BMPs to reduce pollution associated with several sources such as forestry practices, urban development, marinas and boating activities, hydromodification, and others.

Recognizing that, in New Jersey, all land use activities can ultimately impact the State's estuaries, beaches, and marina resources, it was determined that the entire state should be included in the Section 6217 management area. When the New Jersey CNPCP was created in 1995, it found that a vast majority of the required management measures were already addressed through existing programs, rules, regulations, and enforceable policies within and outside the Department. Some management measures were met through voluntary programs. In 1997, New Jersey's CNPCP was conditionally approved by USEPA and NOAA. Since that time, New Jersey has met all but one outstanding condition. The Department's Coastal Management Program continues to coordinate with the USEPA and NOAA to meet the condition regarding inspection of on-site sewage disposal systems. In February 2005, the Department submitted proposed changes to N.J.A.C. 7:9A Standards for Individual Subsurface Sewage Disposal Systems; however, USEPA and NOAA found that this action, while commendable, was insufficient. The Coastal Management Program continues to work with USEPA and NOAA to fulfill the final condition required for full approval of the New Jersey CNPCP. For a complete description of New Jersey's Coastal Management Program, see Chapter 5, Section 5.7.

Floatables Control:

Clean Shores Program:

The Clean Shores Program is administered by the Department's Water Monitoring and Standards' Bureau of Marine Water Monitoring. The Clean Shores Program uses inmates from state correctional facilities to remove wood and garbage from tidal shorelines. In 2006, the program removed 5.3 million pounds of floatable debris from 155 miles of beaches and shorelines, bringing the total amount of wastes removed since 1989 to 114.7 million pounds. Cleaning up these wastes helps prevent the deleterious effects of marine debris upon recreational ocean bathing beaches and the coastal environment. The program is also responsible for building dune fencing and planting dune grass in several oceanfront communities and one state park. In an average year, cleanups are carried out with the cooperation of more than 45 municipalities, seven county agencies, two state parks, one federal park, and the Department of Corrections. The program is funded entirely from the sale of "Shore to Please" shore protection license plates. The sponsoring municipalities and state/federal parks provide support to the program and lay out the initial costs of the cleanup. The Clean Shores program in turn reimburses the sponsors for the cost of waste disposal and contracted services incurred during cleanup activities. Additional information about the Clean Shores Program is available on the Department's Web site at http://www.state.nj.us/dep/wms//bmw/CleanShores/CSmain.html.

Adopt-a-Beach Program:

Since 1993, Adopt-A-Beach volunteers have been cleaning up litter and debris from about 60 beaches, in the spring and fall of each year. The goal of this program is to foster a sense of stewardship of the State's coastal beaches. The adopt a beach program supports two biannual clean up events in April and September to remove beach debris from Atlantic Highlands to Cape May. The twice-a-year activity encourages citizens to adopt a beach and become responsible for cleaning up debris and floatables that can become harmful to marine life. In 2004, over 1,000 volunteers from 60 groups collected more than 58,000 items of trash that would otherwise have become pollution in our coastal waters. In 2005, volunteers collected more than 30,000 items of trash. The amount of trash collected was a reduction from previous years due to rainy weather during the cleanup days. In 2006, 37 groups composed of 565 people removed more than 32,000 items of trash (5600 pounds), covering 62 miles of beach. Poor weather conditions and reduced volunteer interest accounted for this decline in participation for 2006. The cleanup results are forwarded to the Ocean Conservancy for analysis and inclusion in national and international marine debris databases. The results are also used to gauge the type of education and outreach activities needed to change public attitudes and behavior. Additional information about the Adopt-A-Beach Program is available on the Department's Web site at http://www.state.nj.us/dep/watershedmgt/adopt_a_beach.htm.

Passaic River/Newark Bay Restoration Program:

The Passaic River/Newark Bay Restoration Program was created in 1998 to promote the recreational and economic uses of Newark Bay, the Passaic River and its tributaries. The Program is comprised of three elements: shoreline clean-ups, floatables removal, and "in-house" clean-ups.

The shoreline clean-up element has been among the most successful programs of its kind in the nation. Beginning in 1998, The Passaic Valley Sewerage Commissioners (PVSC) began assisting volunteer groups in conducting shoreline clean-ups to remove litter and other debris from along waterways within its service area. In 2000, PVSC created a department of 15 full-time personnel to conduct larger shoreline clean-ups in addition to those organized by volunteer groups and community agencies. To date, PVSC's Restoration Program has conducted or assisted volunteers in more than 250 shoreline clean-ups that have removed over 1,000 tons of litter and debris from area shorelines.

In 1999, PVSC added floatables removal to the Program, after using State grant monies to purchase an innovative 50-foot surface skimmer vessel. Christened the S.V. Newark Bay, this vessel embarks on daily patrols on the Newark Bay and Passaic River, removing floating debris and litter. In 2001, PVSC added a second, smaller skimmer vessel to its clean-up arsenal, this one to conduct daily patrols in shallow water that had been inaccessible to the larger vessels.

PVSC also conducts "in-house" riverbank clean-ups using the services of its employees. These projects are in response to requests for assistance from local municipal leaders. The crew is deployed to clean and restore specific problem areas within the PVSC service area. The success of the program can be demonstrated in its numbers. Since 1998, PVSC has removed 650 tons of floating matter and over 2,000 tons of shoreline debris.

In 2006, PVSC was awarded the New Jersey Clean Communities Program Clean Water Award for waterway clean up activity in Paterson and Newark and the New Jersey Association of Environmental Authorities Wave Award for its River Restoration Program. In 2005, PVSC was awarded the New Jersey Clean Communities Council Special Recognition Award for its assistance in the clean-up of the Kearny Marsh in conjunction with the New Jersey Meadowlands Commission. Additional information about the Passaic River/Newark Bay Restoration Program is available on PVSC's Web site at http://www.pvsc.com/rr/index.htm.

Agricultural Nonpoint Source Pollution Control Program:

The Department continues to foster a partnership with the New Jersey Department of Agriculture (NJDA) and other agricultural organizations to achieve New Jersey's water quality goals. In some of New Jersey's more rural watersheds, agricultural land uses have been identified as a major nonpoint source of pathogens (indicated by fecal coliform levels) and nutrients (indicate by phosphorus levels). Therefore, implementing best management and conservation practices on agricultural lands, which will improve water quality, conserve water and energy, prevent soil erosion and reduce the use of nutrients and pesticides, is an important component of New Jersey's nonpoint source pollution control strategy. The following conservation programs that address nonpoint source point source pollution from agricultural activities are described in detail in the Department's "State of New Jersey Nonpoint Source Report, 2007 Update" (p. 39):

2002 Farm Bill Conservation Programs: In FY 2006, New Jersey received $9,572,113 administered through the following USDA voluntary programs:

- **Conservation Security Program:** $200,000 was awarded to sixteen applicants in the Raritan River Watershed in Morris, Somerset, Hunterdon, and Middlesex Counties.
- **Environmental Quality Incentives Program:** $4,102,532 was contracted with 86 producers to implement new conservation systems.
- **Farm and Ranch Lands Protection Program:** $3,973,785 was passed on to three entities to preserve nearly 2,500 acres from development.

- **Wildlife Habitat Incentives Program:** $1,000,236 was awarded to provide habitat improvements on nearly 3,400 acres.
- **Wetlands Reserve Program:** $435,261 was received to fund a new permanent easement project.
- **Conservation Innovation Grants:** North Jersey RC&D Council received $75,000 to implement "River Friendly Farms" in the Neshanic River Watershed, part of the Raritan River Basin; and the Cook College Equine Science Center at Rutgers, the State University of New Jersey, received $75,000 to implement various grazing land and barnyard area conservation practices at the Equine Science Center, among other activities.

Farm Service Agency (FSA) Programs: NRCS provides technical assistance to applicants and contract holders working with the FSA Programs, which include the following.

- **Conservation Reserve Enhancement Program (CREP):** The New Jersey Department of Environmental Protection, the New Jersey Department of Agriculture (NJDA), and the U.S. Department of Agriculture's Farm Service Agency (FSA) jointly developed a Conservation Reserve Enhancement Program (CREP) for New Jersey. NJ CREP is designed to help farmers reduce nonpoint source pollution caused by agricultural runoff in an effort to improve water quality in New Jersey.

- **Conservation Reserve Program (CRP):** allows producers to retire highly erodible or marginal cropland or pastureland and receive rental payments as well as financial assistance to convert the land to grass or trees.

- **Cooperative Conservation Partnership Initiative (CCPI):** The North Jersey Resource Conservation and Development Council was awarded $84,715 in CCPI grants to restore buffers on river and stream banks, and wetlands on farmland, in the Raritan River Basin through the development and implementation of riparian restoration plans on agricultural lands throughout the Basin.

Additional information on these Farm Bill programs (and other USDA programs) is available on the USDA Web site at http://www.state.nj.us/agriculture/grants/farmbill.html.

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5.6 Total Maximum Daily Load (TMDL) Program

The Division of Watershed Management's Bureau of Environmental Analysis and Restoration is charged with establishing Total Maximum Daily Loads (TMDLs) for impaired waterbodies. TMDLs represent the assimilative or carrying capacity of the receiving water taking into consideration point and nonpoint sources of pollution, natural background water quality, and surface water withdrawals. A TMDL identifies the sources contributing a pollutant of concern and sets load reductions needed to meet surface water quality standards. TMDLs are required, under Section 303(d) of the federal Clean Water Act, to be developed for the pollutant(s) of concern in waterbodies that cannot meet surface water quality standards after the implementation of technology-based effluent limitations. In New Jersey, the Department is responsible for establishing TMDLs for all impaired waters identified on the Section 303(d) List of Impaired Waterbodies, in accordance with a priority ranking (see Appendix B for the 2008 303(d) List). Each TMDL is first proposed as an amendment to the applicable areawide Water Quality Management Plan (see Chapter 5, Section 5.2) and published in the New Jersey Register, followed by a public comment period. Together with the response to comments, a TMDL is established upon submittal to USEPA for approval. Once USEPA approves the established TMDL, it is adopted into the applicable Water Quality Management Plan pursuant to N.J.A.C. 7:15.

The Department has committed to establishing TMDLs in accordance with timeframes that USEPA describes as "expeditious." These included nonpoint sources of stormwater that are now regulated as point sources under the Municipal Stormwater Regulation Program (see Chapter 5, Section 5.4). Significant load reductions from nonpoint sources are needed to attain water quality criteria and designated uses. Each TMDL includes an implementation plan, which identifies a suite of completed, ongoing, and planned activities needed to achieve the identified load reductions. In many cases, the completed and ongoing projects have been made possible through USEPA 319(h) grant awards. This funding is used in conjunction with state funds such as those generated from the Corporate Business Tax (CBT), other federal funds (EQIP, CRP and CREP), and local funds to address nonpoint sources of pollutants. New Jersey will continue to rely on 319(h) funding as a key element for accomplishing NPS reductions through TMDL implementation, thereby restoring water quality and designated uses. Additional information on the 319(h) NPS Pollution Control Grant Program is provided in Chapter 5, Section 5.5.

Since 2000, New Jersey has established a total of 447 TMDLs, 157 of which address the 2006 303(d) List. New Jersey has committed to develop additional TMDLs at a reasonable pace, prioritizing those that address active sources of pollutants and include a regulatory outcome. In addition, the Department has completed work on the Passaic River Basin TMDL and made significant progress in developing a TMDL for the Raritan River Basin. On April 24, 2008, the Department adopted amendments to the areawide Water Quality Management Plans (see Section 5.2) establishing TMDLs to address phosphorus impairments in the non-tidal Passaic River Basin and Pompton Lake/Ramapo River affecting the following waterbodies: Wanaque Reservoir, Dundee Lake, Pompton Lake, and the Ramapo River. The amendments also established watershed criteria, expressed in terms of the response indicator chlorophyll-*a*, for the

Wanaque Reservoir and Dundee Lake, the two critical locations identified through the non-tidal Passaic River Basin TMDL study. Phosphorus was determined to be causing excessive primary productivity at these locations within the non-tidal Passaic River Basin study area. Establishing watershed criteria at these locations was determined to be the best means to ensure protection of designated uses in these locations. A comprehensive TMDL study addressing all conventional pollutant impairments in the non-tidal Raritan Basin (WMAs 8, 9 and 10) including phosphorus, pH, temperature, TSS, and dissolved oxygen, has been completed, the draft report is under review by the Department, and a TMDL is forthcoming.

Additional information about New Jersey's TMDL Program is available on the Department's Web site at http://www.nj.gov/dep/watershedmgt/tmdl.htm.

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5.7 Coastal Management Program

Concerted coastal management efforts began in New Jersey in 1970 with the passage of the Wetlands Act of 1970, N.J.S.A. 13:9A, followed by the Coastal Area Facility Review Act (CAFRA), N.J.S.A. 13:19, in 1973. In response to the 1972 passage of the federal Coastal Zone Management Act, New Jersey developed and gained federal approval of the New Jersey Coastal Management Program, which addresses the complex coastal ecosystem as a whole. The Coastal Management Program defines goals and standards for the purpose of integrating protection and enhancement of natural resources, appropriate land use and development, and public access to, and use of, New Jersey's coastal resources. The program, which was first approved in 1978, brings together the above laws as well as the Waterfront Development Law, the Public Trust Doctrine for access to, and use of, state-owned tidelands, and the regulatory activities of the New Jersey Meadowlands Commission. These laws establish a set of over-arching policies that guide implementation of the New Jersey Coastal Management Program.

A primary mission of the Coastal Management Program is ensuring that coastal resources and ecosystems are conserved as a vital aspect of local, state, and federal efforts to enhance sustainable coastal communities. The Coastal Boundary of New Jersey encompasses the CAFRA Area and the New Jersey Meadowlands District. It also includes coastal waters to the limit of tidal influence, including the Atlantic Ocean (to the limit of New Jersey's seaward jurisdiction); Upper New York Bay, Newark Bay, Raritan Bay and the Arthur Kill; the Hudson, Raritan, Passaic, and Hackensack Rivers, and the tidal portions of the tributaries to these bays and rivers. The Delaware River and Bay, and other tidal streams of the Coastal Plain, are also in the Coastal Area as is a narrow band of adjacent uplands in the Waterfront Development Area outside of the CAFRA Area. Through the Coastal Management Program, the Department manages the State's diverse Coastal Area that includes portions of 17 counties and 245 municipalities.

New Jersey is required by the federal Coastal Zone Management Act to assess its Coastal Management Program every five years and provide a strategy for program enhancements in nine areas. The required assessment areas are aquaculture, coastal hazards, coastal wetlands, cumulative and secondary impacts, energy and government facility siting, marine debris, ocean resources, public access, and special area management planning. The New Jersey Coastal Assessment and Strategy for fiscal years 2006-2010 was approved by the National Oceanic and Atmospheric Administration (NOAA) on August 17, 2006. This five-year strategy ranked the following enhancement areas as either high or medium priority: coastal hazards, cumulative and secondary impacts, ocean resources, and public access. Additional information about New Jersey's Coastal Management Program, as well as the Assessment and the Strategy, are available on the Department's Web site at http://www.nj.gov/dep/cmp.

5.8 Atmospheric Deposition Reduction Strategies

New Jersey Mercury Reduction Activities

In 1993, the Department convened its first Mercury Task Force. This Task Force recommended a stringent reduction in mercury emissions from municipal solid waste (MSW) incinerators, which was subsequently implemented by the Department and resulted in a greater than 90 percent reduction from this source category. A second Task Force was convened in 1998, triggered by a concern that additional significant sources existed and that energy deregulation would increase mercury emissions from Midwestern power plants. The Task Force subsequently reported that air emissions sources were the largest contributors of mercury to the environment in New Jersey, but that some of these emissions left the State via air transport. Atmospheric deposition (wet and dry) was the most significant source of mercury directly entering New Jersey's lands and waters, followed by water-borne and potentially water-borne sources. Potentially significant water-borne sources include point source discharges of wastewater, nonpoint sources of pollution (such as septic tank leachate), and land applied sludge.

The 1998 Mercury Task Force advocated a long-range goal of the virtual elimination of anthropogenic sources of mercury. Towards this goal, a two-step milestone was recommended: 1) a 75 percent reduction in air emissions below 1990 levels by 2006, and 2) an 85 percent reduction below 1990 levels by 2011. The Task Force reviewed all local and regional mercury sources and recommended reductions in all sources, as practicable. New Jersey expects this effort to eventually result in the attainment of water quality standards for mercury, given the scientific and quantitative basis of the current recommendations combined with the record of accomplishment of the first Mercury Task Force. The Mercury Task Force Report, Volumes I through III, can be viewed on the Department's Web site at http://www.state.nj.us/dep/dsr/mercury_task_force.htm.

In a continuing effort to address mercury pollution, the Department is engaged in the following activities:

- The Department promulgated rules to reduce air emissions of mercury that became effective January 7, 2005. These rules were revised November 4, 2006 to provide a one-year extension of the compliance deadline for coal-fired boilers in case additional time is necessary for adjustment, optimization, and alternative reagent evaluation necessary to meet the emission standards in the rules. These rules are expected to lead to substantial reductions of mercury emissions from coal-burning power plants, municipal solid waste incinerators, and iron and steel manufacturing facilities, and to ensure that emissions from medical waste incinerators remain low. An unofficial copy of the rules is available on the Department's Web site at http://www.nj.gov/dep/aqm/Sub27.pdf.

- The Department supported the Mercury Switch Removal Act of 2005, which became effective March 23, 2005. This law required manufacturers of motor vehicles sold in New Jersey to develop and implement a plan to remove mercury-containing switches from end-of-life vehicles. Effective May 11, 2006, all vehicle and scrap recyclers must remove mercury switches before end-of-life-vehicles are crushed or shredded. For each switch removed, motor vehicle manufacturers must pay $2.00 to recyclers and $0.25 to the Department to assist with the cost of implementation.

- New Jersey banned the sale of certain mercury thermometers, under N.J.S.A. 13:1E-99.91-93, which became effective on April 26, 2005. This statute prohibits the sale or promotional offering of basal, oral, or rectal mercury thermometers. The ban does not apply to thermometers utilized in research and development, for professional health care purposes, or for industrial, manufacturing, or commercial purposes.

- The Department is part of the Regional Greenhouse Gas Initiative (RGGI), which was officially launched in December 2005 to reduce CO_2 emissions from power plants. Reductions in greenhouse gas emissions achieved through RGGI and through the introduction of renewable energy sources should also be accompanied by reductions in mercury emissions. Additional information is available on the RGGI Web site at www.rggi.org.

- The Department adopted amendments to the NJPDES rules, known as “The Dental Rule”, on October 1, 2007 to reduce mercury discharge from dental facilities, which contribute 35 percent or more of the mercury entering publicly owned treatment works (POTWs). Mercury from these facilities results from dental amalgam (approximately 50 percent mercury by weight) being rinsed down the drain, usually to a municipal wastewater system, and then to the POTW. Mercury not removed by the POTW’s treatment process is discharged into receiving waters. To determine the effluent base line levels of mercury discharged from the State’s sewage treatment plants, the Department began requiring dischargers to conduct effluent testing for mercury using USEPA method 1631E both before and after implementation of the Dental Rule, to better ascertain the impact of this rule and determine if further actions need be undertaken. (See Section 5.4 Water Pollution Control Programs for more information about the Dental Rule.)

- On November 17, 2006, New Jersey submitted a plan to the USEPA for the Control of Mercury Emissions from Coal-Fired Electric Steam Generating Units required by Clean Air Mercury Rules. Its primary regulatory component is New Jersey's mercury rule. Other regulatory components of the plan are included in the Department’s air permit regulations. The plan shows that New Jersey's existing coal-fired power plants will emit less than the USEPA allocations to New Jersey based on application of the Department’s mercury rule and operating permit limitations. The Department requested that USEPA not include New Jersey in the mercury emission-trading program adopted by USEPA, and that all mercury allowances allocated to New Jersey be retired. It is estimated that, by 2018, over 2000 pounds of mercury will be reduced under New Jersey’s plan.

The Department is also involved in efforts to monitor the effectiveness of these mercury reduction strategies in reducing concentrations of mercury in surface waters of the State.

- The Department completed a major study of atmospheric deposition of mercury and a number of other contaminants through the New Jersey Atmospheric Deposition Network. The Department funded research to investigate historic and current trends in mercury deposition in waterbodies as reflected in sediment concentrations and surface waters, and also continues to monitor mercury levels in fish and issue fish consumption bans and health advisories. Additional information regarding these studies and other mercury-related research is available on the Department's Web site at http://www.state.nj.us/dep/dsr/mercury/.

- The Department continues to support the National Atmospheric Deposition Program's Mercury Deposition by supporting the operation of a monitoring station in New Brunswick, New Jersey that was originally established and funded by the USGS. The Department's support of this monitoring station will ensure that up-to-date information on atmospheric deposition of mercury in the State continues to be available. These data are available to the public at the National Atmospheric Deposition Program Mercury Deposition Network Web site at http://nadp.sws.uiuc.edu/sites/siteinfo.asp?id=NJ30&net=MDN.

- The Department commenced targeted fish tissue sampling near air deposition monitoring stations to evaluate the effectiveness of stack emission controls on reducing air deposition of mercury to surface waters. The objective of this two-year study, "Examination of Local Mercury Concentrations during Reductions in Mercury Emissions in New Jersey", is to determine if reducing mercury emissions from local industry plants will result in a direct reduction in mercury accumulation in fish tissue. To prove this correlation, fish tissue samples (Largemouth Bass), water samples, and leaf samples are being collected and analyzed for mercury content. Largemouth Bass are the target species for tissue due to their trophic status, tendency for high mercury levels in tissue, the frequent target of anglers, and its wide range distribution in a variety of New Jersey waters. Measuring mercury content of the water, and from air deposition (via leaf sampling), will be used to compare these reduction efforts directly to local accumulation. The data collected during this study will assist New Jersey in determining the extent of New Jersey mercury emissions that contribute to local sources of mercury accumulation in fish tissue collected in New Jersey, and establishing a correlation between reducing mercury emissions and accumulation of mercury in fish tissue. The Department is currently studying four lakes near local mercury sources that have or will be reducing their mercury emissions. Two-year-old largemouth bass were collected at each lake in 2007 and the sampling will be repeated in 2009. Leaf samples were also collected up and downwind of the lakes. Fish and lead samples will be analyzed for mercury content. Resampling is planned for 2011 and 2013, pending additional funding.

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5.9 New Jersey Environmental Infrastructure Trust Financing Program

Clean Water Projects

In the 1987 amendments to the federal Clean Water Act (CWA), Congress required states to establish a Clean Water State Revolving Fund (CWSRF) program to qualify for federal capitalization grants. The CWSRF provides financial assistance for the construction of projects that protect, maintain, and improve water quality. Established in 1988, New Jersey's CWSRF program is included in the New Jersey Environmental Infrastructure Financing Program (NJEIFP), a partnership between the Department and the New Jersey Environmental Infrastructure Trust (NJEIT), an independent state financing authority. NJEIFP is a revolving loan program that offers low-cost financing to local government agencies and private water purveyors for the construction of wastewater and drinking water infrastructure, landfill construction and closure, and stormwater management and nonpoint source pollution control projects. Nonpoint source projects may include open space acquisition and remedial action, such as a brownfields cleanup, that produce a water quality improvement. (See Section 5.10 for more details on NJEIFP funds for open space acquisition.)

A priority ranking system was created to decide which clean water projects should be funded in a given funding cycle. The system was first developed in 1982 and is constantly evolving. Every year the Department develops a "Proposed Priority System, Intended Use Plan, and Project Priority List" as required by federal and State law. The Priority List identifies projects targeted for financial assistance from the CWSRF and identifies the estimated total eligible building costs under the appropriate project category. The Department ranks projects based on the nature of the wastewater problem. Table 5-3 summarizes the Clean Water Loan Awards issued in State Fiscal Years 2005 and 2006.

Table 5-3: Clean Water Loan Awards SFY 2005-2006

SFY	Type of Projects	Number of Loan Awards	Amount of Loans Awarded
2005	Clean Water	27	$207,472,167.00
2005	CW-Land Acquisition	8	$ 21,246,809.00
2005	Drinking Water	16	$ 56,191,334.00
	2005 Totals:	**51**	**$284,910,310.00**
2006	Clean Water	29	$415,893,513.00
2006	CW-Land Acquisition	6	$ 16,358,519.00
2006	Drinking Water	13	$ 49,206,156.00
	2006 Totals	**48**	**$481,458,188.00**

Additional information about NJEIFP is available on the Department's and NJEIF's Web sites at http://www.state.nj.us/dep/dwq/mface.htm#finance, http://www.state.nj.us/dep/dwq/cwpl.htm, and http://www.njeit.org/.

Coastal Grants:

New Jersey Public Law 2005, Chapter 301 appropriated $30,000,000 for Department-issued grants to local government units for wastewater treatment system projects. The New Jersey Combined Sewer Overflow (CSO) Control Program benefited significantly from this action. The legislation provided a total of $3,000,000 for 24 entities to fund up to 20 percent of the cost for development and evaluation of pathogen control alternatives and cost performance analyses for combined sewer systems required by the NJPDES permit program. The legislation also provided $24,180,000 for financing up to 20 percent of the construction costs for wastewater treatment system projects. The funds were used for a wide variety of wet weather water quality improvement projects, including separate sanitary and stormwater sewer systems, combined sewer systems, and nonpoint source pollution abatement. The legislation also appropriated $2,820,000 to two local government units to finance up to 20 percent of the project cost for wastewater effluent reuse/recharge projects. Since these funds were appropriated and allocated for specific projects, this funding program is no longer active.

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5.10 Land Acquisition for Water Quality Protection

Open space preservation is essential to protecting and enhancing the quality of life in New Jersey's communities. Poorly designed development threatens our precious water supplies and other vital natural resources by increasing the amount of pavement and impervious cover, and preventing rainfall from replenishing underground aquifers. New roads and large, scattered housing sites create currents of stormwater runoff that carry trash, road salts, oil, and other contaminants into our streams and rivers. Preserving open space protects land from development, safeguards our water supplies and other natural resources, and provides outdoor recreational opportunities.

As of March 1, 2007, there were 1,190,323 acres of land statewide being used for conservation and public recreation purposes, of which federal, state, county, and municipal agencies have preserved 1,124,237 acres for public recreation and open space uses. The rest is preserved by private conservation interests. The statewide total does not include 151,663 acres of preserved farmland acreage. The National Park Service and the United States Fish and Wildlife Service manage over 113,000 acres of land or 10 percent of the State's open space. State government agencies administer 738,592 acres or 65 percent of New Jersey's preserved recreation land and open space. County and municipal governments are responsible for over 212,000 acres or 19 percent of public parkland across the State. Nonprofit conservation organizations have preserved 71,000 acres of land statewide. Conservation organizations manage six percent of New Jersey's open space.

The Green Acres Program:

The Green Acres Program (Green Acres) was created in 1961 to meet New Jersey's growing recreational and conservation needs. As the principal land acquisition agent for the Department, Green Acres acquires land for state parks, forests, natural areas, and wildlife management areas. The Program also provides matching grants and low interest (two percent) loans to municipal and county governments, and matching grants to nonprofit conservation organizations, to acquire open space and develop outdoor recreational facilities. To date, Green Acres has protected more than 615,000 acres of open space and developed hundreds of public parks, bringing the statewide system of preserved open space and farmland to more than 1.34 million acres. Green Acres also administers the "Tax Exemption Program," which provides exemption from local property taxes to eligible nonprofit organizations that own recreation or conservation lands and allow public access. Green Acres acquired a total of 77,641 acres of land for preservation between July 1, 2002 and March 1, 2007.

New Jersey has long recognized the importance of protecting headwater areas of rivers, streams, lakes, reservoirs, wetlands and associated buffers, and coastal waters. These lands protect ecological resources and water quality, provide water-based recreational opportunities, and serve as linear open space linkages. Public Law 2002, Chapter 76, directs the Green Acres State Land Acquisition Program to prioritize land for acquisition for the protection of water resources and flood prone areas. As a result of this legislation, Green Acres has revised the ranking system used to evaluate state land projects based on water resource features, biodiversity, and other relevant factors. The new ranking system assigns three times the weight for water resource lands and two times the weight for flood prone areas as compared to other priority criteria. While the protection of water resources through land preservation has been a goal of Green Acres since its inception, this legislation further focuses Green Acres preservation efforts on lands that protect important water resources.

Green Acres also published *The Land Preservation Plan for 2005-2007*, which explains the criteria and process by which Green Acres considers land for acquisition, and sets forth policy to guide Green Acres in its state land acquisition efforts. During the preparation of this plan, several other plans and studies were consulted and reviewed to ensure that the State was undertaking a comprehensive approach in its water resource and open space planning. While the plan does not list individual parcels, it clearly identifies areas of New Jersey that are considered priorities for state land acquisition. The identification of these areas will establish a basis for decision-making by the Green Acres Program when both reacting to land offerings and targeting lands for preservation. State land acquisition activities covered in this plan include all the methods employed by the State to preserve land, fee simple acquisition, the purchase of easements and development rights, and the acceptance of donated land. The Green Acres Program works with property owners in the municipalities identified for land acquisition. The Land Preservation Plan is available on the Department's Web site at http://www.nj.gov/dep/greenacres/sitemap.htm#l.

New Jersey Environmental Infrastructure Financing Program:

The New Jersey Environmental Infrastructure Financing Program (NJEIFP) is a partnership between the Department and the New Jersey Environmental Infrastructure Trust (see Section 5.9). Land acquisition financed through the NJEIFP must demonstrate a water quality benefit. Headwaters, stream corridors, wetlands, watershed protection, and aquifer recharge areas are among the types of land that would qualify. While lands purchased through the NJEIFP cannot be developed, they may be used for passive recreational activities such as hiking, fishing, and horseback riding. Conservation easements placed on funded parcels assure that the water quality benefits are preserved. The NJEIFP works closely with the Green Acres Program to maximize a community's limited funds for land acquisition. Through this partnership, municipalities can receive the resources necessary to purchase larger and/or more expensive parcels before they are lost to development. If only a portion of a parcel is eligible for NJEIFP financing, the remaining portion of the land may be financed through open space acquisition programs such as Green Acres or local programs funded by county and municipal open space taxes. In state fiscal year (SFY) 2005, $21,246,809 in loans were awarded for eight land acquisition projects. In SFY 2006 $16,358,519 in loans were awarded for six land acquisition projects. Additional information about Clean Water Financing for open space preservation is available on the NJEIT's Web site at http://www.njeit.org/openspace.htm.

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5.11 Water Education and Outreach

In recognition that some water pollution problems, such as nonpoint source pollution, require approaches other than the traditional regulatory approach (i.e., discharge permits with numeric effluent limitations), the Department administers a cadre of nonregulatory programs and initiatives for water quality restoration, protection, and enhancement; however, some of the Department's water pollution control programs also employ nonregulatory elements, such as education and outreach, either in lieu of, or in tandem with, other permit requirements. Recognizing the need to promote stewardship of our state waterways, the Department has developed many informational programs and materials for stormwater, nonpoint source pollution, water quality, and watershed education and outreach.

The New Jersey Watershed Ambassadors Program is an environmentally-oriented AmeriCorps program that places a trained Watershed Ambassador in each of New Jersey's twenty watershed management areas. These Ambassadors work with local volunteers to monitor local rivers through the Visual Assessment and Biological Assessment protocols employed by the Watershed Watch Network (see description below). They also promote watershed stewardship and provide information through presentations at community organizations and schools. The Watershed Ambassadors Program is administered by the Division of Watershed Management.

The Watershed Watch Network (also known as the Volunteer Monitoring Program) is an umbrella program for all volunteer monitoring programs within New Jersey. The Watershed Watch Network has two advisory committees: 1) Data Users and Water Resource Managers make up the Internal Advisory Committee, and 2) Volunteer Monitoring Program Managers throughout the State make up the Watershed Watch Network Council. A four-tiered approach (PDF Format) has been developed that allows volunteers to pick their level of involvement based on the purpose of their monitoring program, the intended data use, and the intended data users. The goal of this program is to provide acceptable protocols and quality assurance/quality control (QA/QC) requirements for volunteers who chose to submit their data to the Department, assist volunteers in designing and enhancing existing programs, and assist data users in gathering scientifically-sound data appropriate for its intended uses. The Watershed Watch Network is coordinated within Water Monitoring and Standards' Bureau of Freshwater and Biological Monitoring (see Chapter 2, Section 2.1 Summary of Water Monitoring Programs).

The Division of Watershed Management administers a number of watershed-focused public education and outreach programs. The **"**Clean Water Raingers**"** program offers educators a number of teaching materials for their students as well as background information on watersheds and nonpoint source pollution. Educators who participate are provided with free booklets and associated materials for elementary school-age students. **"**Project WET" (Water Education for Teachers) is a national program that offers teachers a better understanding of the world's water resources through hands-on, multi-disciplinary lessons. NJ Project WET teaches about the importance and value of water in our every day life while offering specialized programs about New Jersey's water resources and watersheds.

The Urban Watershed Education Program educates young students living in New Jersey's urban estuaries about the hazards of eating contaminated fish and helps them to enjoy and respect their local water resources by focusing on healthier fishing and shellfishing alternatives in their community. This intensive four-day program gives students the opportunity to experience their local waters first-hand through storm drain marking and fishing activities. Originally focused in the Newark Bay Complex, this program now educates students in urban waterfront communities throughout the State, including Trenton and Camden. This program is administered jointly by the Department's Division of Science, Research and Technology and the Division of Watershed Management, in conjunction with the Hackensack Riverkeeper.

The Department's Division of Water Quality has developed a public information campaign known as Clean Water NJ. This program is aimed at reducing nonpoint source pollution carried by stormwater runoff by encouraging New Jersey citizens to change behavior that results in water pollution. The campaign includes television commercials, radio ads, posters, a Web site, and educational brochures. As part of this campaign, the Department also created the Clean Water Car Wash Fundraising Program, which connects organizations with participating car washes to raise money without harming the environment. The Clean Water NJ Web site (www.cleanwaternj.org) provides information to the general public about "stormwater pollution" and what citizens can do to help reduce it in their homes, cars, and communities. The Web site also provides links to educational resources for teachers and for the general public.

The Division of Watershed Management's outreach and education Web site (http://www.nj.gov/dep/watershedmgt/outreach_education.htm) provides additional information about many of the programs summarized above and offers many tools for stormwater, nonpoint source pollution, and watershed education efforts. These include newsletters and brochures for the community at large, as well teacher workshops, free classroom presentations, and publications for students and teachers. In addition, the Department's Environmental Education Program has developed a nationally acclaimed Web site, the "State Environmental Education Directory" (SEEDS) Web site, which provides educational materials and links to additional educational resources on many environmental topics, including water pollution, conservation, and stewardship. Additional information about SEEDS is available on the Department's Web site at http://www.nj.gov/dep/seeds. This program is administered by the Department's Office of Communications.

The Department also administers the Adopt a Beach Program. This program is a volunteer initiative that invites groups, organizations, businesses, and individuals to adopt a small section of beach or waterfront area. This statewide coastal cleanup effort displays New Jersey's commitment to combat water pollution and to maintain the aesthetic quality of the state's coastal shorelines (see Chapter 5, Section 5.5, Nonpoint Source Pollution Control Programs, under Floatables Control).

The Department also annually hosts World Water Monitoring Day, the culmination of a month-long initiative during which people from around the globe join together to monitor the quality of their local watersheds and enter the results of their efforts into an international database. A major goal of this effort, since its inception in 2002, is to create an awareness of how important it is to protect our waterways, a resource on which our lives depend. On World Water Monitoring Day, local teachers and students are invited to learn from and interact with staff from the Department, USGS, USEPA Region 2, and various other federal, state, and local agencies, as these agencies demonstrate water quality monitoring activities using chemical, biological, and flow techniques at a site within New Jersey. Students have the opportunity to conduct their own simple water quality tests and enter the collected data on the international World Water Monitoring Day Web site. Informational display tables are provided and leaders from the various local agencies are on hand to outline their monitoring programs and answer questions.

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5.12 Regional Water Quality Initiatives

Highlands Region Water Resource Protection Program:

The historic Highlands Water Protection and Planning Act (Highlands Act) was signed into law (N.J.S.A. 13:20-1 et seq.) on August 10, 2004. The purpose of the Highlands Act is to preserve an essential source of clean and plentiful drinking water for one-half of the State's population, and to protect the State's great diversity of natural resources. The Highlands Region supplies drinking water to over 5.4 million people or approximately 379 million gallons of drinking water daily. In addition to water resources, the northern New Jersey 800,000-acre Highlands Region contains exceptional natural resources such as contiguous forest lands, wetlands, pristine watersheds, and plant and wildlife habitat. The region contains many sites of historic significance and provides abundant recreational opportunities.

The Highlands Act documents the geographical boundary of the Highlands Region in New Jersey and establishes a Highlands Preservation Area (Preservation Area) and a Highlands Planning Area (Planning Area), each of roughly 400,000 acres. Additionally, the Highlands Act required the Department to establish regulations in the Highlands Preservation Area and created a Highlands Water Protection and Planning Council to develop a regional master plan for the entire Highlands Region.

The Highlands Act sets forth requirements for major development projects in the Highlands Preservation Area, to be implemented by the Department. The Department is charged with issuing a "Highlands Preservation Area Approval" to ensure compliance with all of its regulatory programs, including those implemented pursuant to the Freshwater Wetlands Protection Act, the Flood Hazard Area Control Act, the Endangered and Non-Game Species Conservation Act, the Water Supply Management Act, the Water Pollution Control Act, the Realty Improvement Sewerage and Facilities Act (1954), the Water Quality Planning Act, and the Safe Drinking Water Act. In addition, the Highlands Act withdrew approved sewer service area designations in the Highlands Preservation Area where wastewater collection systems were not installed by August 10, 2004 (except where exemptions were specified). On October 6, 2006, the Department amended all applicable areawide Water Quality Management Plans to reflect this withdrawal of sewer service area designations.

On November 1, 2006, the Department readopted the Highlands Water Protection and Planning Act rules at N.J.A.C. 7:38, which implement the enhanced environmental standards established in the Highlands Act. The rules establish a consolidated Highlands permitting review and approval process for activities constituting major Highland development and establish a standard to prevent the degradation of water quality in consideration of deep aquifer recharge. As a prerequisite for Department permit applications for Highlands Preservation Area development proposals, the Division of Watershed Management makes Highlands Applicability determinations (including project exemption status) and Water Quality Management Plan consistency determinations. These determinations identify regulated activities in the Highlands preservation area, determine exemption status of these activities, and determine if the activities are consistent with the Water Quality Management Plan, to guide the course of permitting for the Department under the Highlands Act. Additional information about the Highlands Act and its implementation is available on the Department's Web site at http://www.nj.gov/dep/highlands/.

National Estuary Programs:

Estuaries are places where rivers meet the sea and where fresh water and salt water mix. Estuaries are vital ecosystems that are critical to early life stages of many species of fish and are critical to the health of coastal environments and to our enjoyment of them. Congress established USEPA's National Estuary Program (NEP) in 1987 to improve the quality of estuaries of national importance. Section 320 of the federal Clean Water Act directs USEPA to develop plans for attaining or maintaining water quality in an estuary. This includes protection of public water supplies; protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife; allows recreational activities in and on water; and requires control of point and nonpoint sources of pollution.

There are 28 National Estuary Programs across the country that are authorized under the federal Clean Water Act to protect, preserve, and restore the nation's estuaries. Each National Estuary Program is a partnership of federal, state, and local government agencies, non-profit groups, academics, and individual citizens that is charged with creating and implementing a Comprehensive Conservation and Management Plan (CCMP) that addresses all aspects of environmental protection for the estuary, including issues such as water quality, habitat, living resources, and land use. The CCMP is based on a scientific characterization of the estuary, and is developed and approved by a broad-based coalition of stakeholders. The CCMP establishes priorities for action, research, and funding, and serves as a blueprint to guide future decisions and activities related to the estuary.

New Jersey participates in three National Estuary Programs: the Barnegat Bay Estuary Program, the Delaware Estuary Program, and New York/New Jersey Harbor Estuary Program.

Barnegat Bay National Estuary Program (BBNEP):

The Barnegat Bay – Little Egg Harbor Estuary is located along the central New Jersey coastline within the Atlantic Coastal Plain physiographic province. The 75-square-mile, environmentally sensitive estuarine system consists of aquatic vegetation, shellfish beds, finfish habitats, waterfowl nesting grounds and spectacular vistas. Its 660-square-mile watershed encompasses most of the 33 municipalities in Ocean County as well as four municipalities in Monmouth County. Although long recognized for its great aesthetic, economic, and recreational value, this back bay system is now affected by an array of human impacts that potentially threaten its ecological integrity.

The entire watershed has undergone dramatic growth since 1950. During the 1990s, the municipalities surrounding the bay reported population expansions that, on average, exceeded 20 percent. Now home for approximately 500,000 people, the current population more than doubles during the summer season. The development accompanying the increasing population growth has changed land use from principally undeveloped and agricultural to suburban. Boat traffic on the bay, including personal watercraft, has also significantly increased, raising concerns about use conflicts and cumulative impacts on the bay's water quality. An assessment of the estuary indicates that human activities in the watershed and estuary, particularly new development spurred by increased population growth, have led to measurable degradation of water quality, destruction of natural habitats, and reduction of living resources in the aquatic ecosystem.

The Barnegat Bay National Estuary Program (BBNEP) is "a partnership of federal, state, and local interests" overseeing the development and implementation of a management plan for the entire Barnegat Bay watershed. The BBNEP is made up of subcommittees that oversee the various aspects of the management plan: the Science and Technical Advisory Committee (STAC), the Advisory Committee, and the Policy Committee. Recently, a Sustainable Communities Workgroup was also initiated to address development and related issues affecting water quality. With more than one-third of the Action Items from its 2002 Comprehensive Conservation and Management Plan (CCMP) completed, and in response to USEPA's fall 2006 Implementation Review, the BBNEP embarked upon a year-long process of strategic planning to identify program priorities and refocus partnership efforts. As a result of its strategic planning process, the BBNEP committed to addressing five priority areas in the coming three years (2008-2011), including:

- Improving recognition and understanding of the bay's condition, and addressing the causes of water quality degradation within the ecosystem, especially eutrophication in the bay and stormwater and nonpoint source pollution in the watershed;
- Addressing water supply and flow issues that affect the bay and watershed;
- Preventing habitat loss, especially of submerged aquatic vegetation, and supporting habitat restoration; and
- Improving understanding of, and addressing, fisheries declines.

The following action items were undertaken since the last Integrated Report was published:

- **GIS Based Tool for Riparian Zone Health:** The BBNEP funded a project by the Grant F. Walton Center for Remote Sensing and Spatial Analysis (CRSSA) at Rutgers, The State University of New Jersey, to define and characterize the health of streamside riparian areas within the Barnegat Bay Watershed. The updated mapping revealed that the Barnegat Bay Estuary system is continuing to experience a significant conversion of forested and wetland habitats to urban land cover, which may exacerbate nutrient loading to the Barnegat Bay Estuary. The study also identified approximately 1,300 acres of barren land and 677 acres of agricultural land within the mapped riparian zones that could serve as potential targets for revegetation and restoration. Over 600 acres, or approximately one third of the area identified as potentially restorable land, is located in the highest priority sub-basins that have the highest percentage of altered riparian zones. Additional work is needed to translate the results of this assessment to refine and prioritize a site-level portfolio of possible restoration targets.

- **Barnegat Bay Water Supply/Hydrologic Database Study:** USGS continues to conduct studies to assess the quality of ground and surface water flowing into the Barnegat Bay. Because ground water discharge from the Kirkwood-Cohansey aquifer accounts for a high percentage of surface water flow in the watershed and is the largest source of freshwater to the Barnegat Bay, the USGS examined the status and trends of, regional ground water quality in the Barnegat Bay-Little Egg Harbor Estuary watershed using an extensive well water database maintained by the Ocean County Health Department (OCHD). As part of the OCHD's efforts to monitor shallow ground water quality and protect human health, well water data are collected from privately-owned wells throughout Ocean County upon well installation or in association with real-estate transactions, such as the sale of a house. This well testing program generated an extensive database that contains results of analyses for a variety of water quality constituents including nutrients, heavy metals, volatile organic compounds, pesticides, and microbial contaminants. Additional studies are needed for detailed spatial analysis of water quality trends in nitrates and other contaminants. In particular, more precise information on well location and well-construction characteristics (e.g., well depth) is needed to understand the effects of land-use change on ground water concentrations of nitrates and other contaminants.

- **Impacts of Harmful Algae on Eelgrass Beds in Barnegat Bay:** Seagrasses are one of the most sensitive indicators of long-term water quality and can be used as a barometer of a coastal ecosystem's health. Changes in the vitality and distribution of these vascular plants may signal a decline in aquatic ecosystem health. The BBNEP funded research by Montclair University in 2005 to identify impacts of macroalgal loading and brown-tide conditions on the health, spatial coverage, and biomass of eelgrass in Barnegat Bay. Experiments were conducted in Barnegat Inlet and Ham Island in June through August, the peak potential period for harmful algal blooms in Barnegat Bay. Results were variable, indicating a need for additional studies to understand the complex, interacting factors contributing to seagrass declines in Barnegat Bay.

- **Nonpoint Source Pollution Control Projects in Long Swamp Creek Watershed:** The BBNEP received Section 319(h) funds from the Department for two projects in this watershed, identified by the Department as a priority for SFY 2005 funding due to biological impairment. The projects include wetland enhancement and riparian corridor restoration at the Ocean County Vocational School, and implementation of golf course BMPs at the Bey Lea municipal golf course. The school project will re-establish a riparian buffer and expand the vegetated area to provide vegetative treatment of stormwater prior to discharge from athletic fields and parking areas into headwaters of Long Swamp Creek. This project will also include an educational program at the public school to increase awareness about stormwater and nonpoint source pollution within the watershed. The golf course project includes implementation of a goose barrier/riparian enhancement plan along four in-line ponds that are heavily used by resident populations of Canada geese. Approximately 25 to 30-foot wide vegetative barriers will be established along sections of the ponds; additional no-mow zones and "geese police" will be used to reduce geese populations on the golf course.

- **Water Quality Monitoring in Barnegat Bay Using Data Loggers:** The BBNEP is continuing an initiative to provide accurate and comprehensive measurements of water quality parameters in the Barnegat Bay Estuary. The BBNEP, in cooperation with the Rutgers University Institute of Marine and Coastal Sciences, the New Jersey Department of Environmental Protection's Water Monitoring and Standards, and Monmouth University's Urban Coast Institute, has established two sampling stations in the Barnegat Bay (Seaside

Park and Little Egg Harbor) for long-term water quality monitoring. The project employs YSI 6600-M automatic data logger units for estuarine water quality monitoring. Parameters are measured every 30 minutes and include temperature, salinity, pH, dissolved oxygen, and turbidity, all of which greatly influence biotic communities in the Estuary.

Additional information about the Barnegat Bay National Estuary Program is available on the BBNEP Web site at www.bbep.org.

The Delaware Estuary Program:

The Delaware Estuary makes up 51 percent of the Delaware River Basin. The Delaware Estuary stretches from Trenton, New Jersey and Morrisville, Pennsylvania south to the mouth of the bay between Cape May, New Jersey and Cape Henlopen, Delaware. In addition to its remarkable natural habitats, the Delaware Estuary maintains the world's largest freshwater port, as well as a strategic military port. The port is home to the second largest refining-petrochemical center in the United States, providing seventy percent of the gasoline and heating oil for the entire East Coast. The Basin also contains six nuclear reactors and one of the world's great concentrations of heavy industry. The entire watershed for the Estuary covers roughly 6,747 square miles of land that drains into 134 miles of the Delaware River and Bay. The entire Delaware River Basin is 13,539 square miles, draining parts of Pennsylvania (50.3%), New Jersey (23.3%), New York (18.5%), and Delaware (7.9%). The Delaware River itself is the longest undammed river east of the Mississippi; it is fed by 216 tributaries and extends 330 miles to the mouth of the Delaware Estuary.

The watershed of the Delaware Estuary continues to undergo shifts in land use. Between 1970 and 1990, developed land within the watershed increased by 20 percent. Developed lands are forecast to substantially increase by another 36 percent, roughly 275,000 acres, between 1990 and 2020. This rapid growth in developed land is predicted to outpace population growth for the Estuary region, which is forecast to undergo only a modest increase of 11 percent from 1990 to 2020. All this suggests that the predicted growth will be associated mainly with urban sprawl. Such changes in land use patterns in the three states within the Estuary present major challenges for environmental managers, as natural lands and farmlands are converted for residential and commercial use. Changes in land use patterns have customarily been associated with increased stormwater runoff, which carries higher concentrations of nutrients, toxics, and heavy metals to the Estuary. Pollution from land-based activities, loss of habitat, and the disruption of hydrologic functions are attributable to land use alteration in the watersheds of the Delaware Estuary.

As a former center for the Industrial Revolution in the New World, the greater Philadelphia region also contains a pollution legacy lasting more than 300 years; much of the present pollutant runoff can be attributed to past industry. Chlorinated organic compounds, such as polychlorinated biphenyls (PCBs), chlordane, and DDT, have been found in the tissues of fish and shellfish in the Delaware Estuary, which has resulted in fish consumption advisories issued for the entire Estuary. In addition to the human health risks from consuming contaminated fish, PCBs also represent a direct ecological risk to wildlife and aquatic biota in the Estuary. Elevated levels of PCBs, DDT and its metabolites, and chlordane have been detected in Peregrine Falcon eggs from the Estuary.

As a National Estuary Program, the Partnership for the Delaware Estuary (Partnership) is charged with implementing the goals of its 1996 "Comprehensive Conservation and Management Plan" (CCMP). This is a guiding document that includes numerous education, outreach, science, management, and policy goals. Until 2004, the Partnership operated as a non-profit alongside the Delaware Estuary Program (DELEP), a separate entity that was established in 1998 as the only tri-state effort among the National Estuary Programs. The Partnership focused its attention on educating the public about the Estuary and building stewardship for this important natural resource while DELEP worked to facilitate interstate coordination and enhancement of the overall resource management capacity. In 2004, DELEP and the Partnership merged to form a single organization: the Partnership for the Delaware Estuary, a National Estuary Program. The reorganized Partnership is now charged with addressing the full complement of actions called for in the CCMP. The Department participates on the Partnership's Steering Committee, the Estuary Implementation Committee, the Science and Technical Advisory Committee, the Toxics Advisory Committee, the Monitoring Advisory Committee, and various technical workgroups.

CCMP Action Items:

The Delaware Estuary CCMP contains 77 Actions Items, 69 of which have been implemented or initiated to date. Partnership accomplishments over the past two years include the following:

- **2005 and 2007 Science Conference and Environmental Summit:** In early 2005, the Partnership convened a science and management conference to summarize the current state of science in, and identify and prioritize science and management needs for, the Estuary. The Conference was the first in over ten years and its outcome provided for the development of the "2006 - White Paper on the Status and Needs of Science in the Delaware Estuary".

  In 2007, the Second Delaware Estuary Science Conference and first Environmental Summit were held. The three-day event included a diverse array of general and special sessions. Over 275 individuals participated, which exceeded attendance at the 2005 Science Conference. Presentations also exceeded 2005 numbers with 104 formal presentations, including 23 for the Environmental Summit. The presentations and a Who's Who Resource Directory are available on the Partnership's Web site at www.DelawareEstuary.org.

  The next Delaware Estuary Science and Environmental Summit will be held on January 11-14, 2009 in Cape May, New Jersey. The Delaware Estuary Science Conference and Environmental Summit provide a unique opportunity for representatives from diverse environmental sectors throughout the watershed to meet and share ideas and information. By pairing representatives from different interest groups in a retreat-type atmosphere where they are encouraged to interact and address challenging questions, this forum helps link science, management, policy, and on-the-ground activities, advancing ecosystem-based management and restoration of the Estuary.

- **Science and Technical Advisory Committee (STAC):** Re-established in May 2006, the principal purpose of the STAC is to provide the Partnership and collaborating entities with objective, expert advice and peer review for overall scientific and technical matters related to NEP activities and goals, such as those specified in the CCMP. The STAC works with the Estuary Implementation Committee to identify and prioritize science and technical needs within the Delaware Estuary and its watershed, and assists with the Partnership's efforts to raise awareness and resources for addressing these needs. The STAC also facilitates communication among other specialized science and technical committees, and recommends forming and disbanding new STAC sub-committees and technical workgroups as needed.

The STAC's agenda for 2007–2008 includes planning for the 2009 Science & Environmental Summit; providing input for a Joint PDE/Academy of Natural Sciences Climate Change Workshop (May 6, 2007), assisting with development of indicators and the 2008 State of the Estuary Report, identifying concerns/questions on ecological flows and DRBC's proposed Flexible Flow Management Plan, identifying needs/options for Estuary-wide data management and Web-based clearinghouse, and providing input/guidance for benthic community monitoring in 2008.

- **Delaware Estuary Information Gateway (DEIG):** The Partnership has developed a new Web-based information clearinghouse, the Delaware Estuary Information Gateway (DEIG), to be used by the public, educators, scientists, and managers to access a diversity of environmental information about the Delaware Estuary. The DEIG includes information about existing environmental issues, living resources (flora and fauna), types of habitats, and human uses and their effects, on a regional basis throughout the estuary watershed.

- **National Water Quality Monitoring Network:** The National Water Quality Monitoring Council has designed a National Water Quality Monitoring Network for U.S. Coastal Waters and their Tributaries (Network), as called for in the U.S. Ocean Action Plan, with guidance from the President's Council on Environmental Quality and the National Science and Technology Council. The Network design is a framework for linking water quality monitoring in coastal bays, estuaries, and the Great Lakes with observations in upland areas and offshore waters, and includes freshwater flows and contaminant input from inland and coastal rivers, ground water, and atmospheric deposition. A description of the Network design is available at http://acwi.gov/monitoring/network/design. The current phase of Network development is the implementation of regional Pilot Studies to test and help improve the Network design. In 2007, the Delaware River Basin Commission/Partnership was selected as one of three systems in the nation to be accepted as a pilot study area for this new Network.

- **Delaware Estuary Wetland Workgroup (DEWWG):** was formed over the summer of 2007 to provide wetland monitoring and design ideas for the Network pilot (see above). Representatives from the Delaware Department of Natural Resources and Environmental Control, the Pennsylvania Department of Environmental Control, NOAA, EPA Headquarters and Regions 2 and 3, universities and non-profit organizations (Rutgers, the State University of New Jersey, NatureServe, and the Academy of Natural Sciences) volunteered to participate in work group activities. The group met five times during the summer and fall, resulting in the first comprehensive monitoring and assessment design for Delaware Estuary tidal wetland condition and extent. The design outlines a $933,000, five-year program that would ideally be repeated every 5-10 years.

- **PCB TMDL Efforts**: The CCMP identified the reduction of toxic substances in the Estuary as one of its most important objectives. USEPA Regions 2 and 3, along with the three state environmental protection agencies, have worked cooperatively with DRBC to develop a PCB TMDL for the tidal portion of the Delaware River, the implementation of which is essential for removing the fish consumption advisories in the Delaware Estuary. The Delaware River Basin Commission (DRBC) is the designated lead agency for developing the technical basis for the PCB TMDLs.

  PCB loads from all sources were estimated, including contaminated sites under the respective jurisdictions. For contaminated sites, which are a significant source, USEPA and the states developed ranking criteria to categorize a subset of sites likely to contribute a PCB load to the Delaware Estuary. Subsequently, they developed load estimates (using the Universal Soil Loss Equation) for that subset based on site PCB measurements. Only sites located between the tributary monitoring locations and main-stem Delaware were considered. Monitoring and pollutant minimization plans are required for wastewater treatment facilities. Other sources, including the air, ocean, and tributaries, also require load reductions in order to achieve the overall goal.

  The USEPA approved the Stage I PCB TMDL on December 15, 2003 and Stage II PCB TMDL work is currently scheduled for completion in December 2008. In October 2003, DRBC established an Implementation Advisory Committee (IAC) to assist in the development of early actions to reduce loadings of PCBs to the Estuary. IAC members include representatives from the States of New Jersey, Delaware, and Pennsylvania, the USEPA, industry, municipal governments, wastewater and water treatment authorities, and environmental groups including the Partnership. The IAC has been working to determine the actions that can be taken immediately to begin mitigating sources of PCBs. A priority action plan for PCB sites has been drafted in coordination with the Delaware Toxics Reduction Program (DelTRiP), indicating 13 steps to implementation.

- **Delaware River Toxics Reduction Program (DelTRiP):** DelTRiP was created in 2004 as a joint effort between the DRBC, USEPA, the Delaware Department of Natural Resources and Environmental Control, the Pennsylvania Department of Environmental Protection, and the Department. The goal of DelTRiP is to identify, prioritize, track, and report the status of sites within the Basin that significantly contribute toxic loadings to the Delaware River Basin.

  In February 2007, DRBC published the second annual report of DelTRiP that focuses on sites identified as containing polychlorinated biphenyls (PCBs). DelTRiP staff conducted file reviews to obtain historical information and current remediation status for sites submitted by the state and federal agencies in the 2006 DelTRiP report. DelTRiP has identified a total of 112 sites in the Delaware River Basin (53 sites with ongoing PCB remediation and 59 sites with currently unavailable files) which have been incorporated into a DelTRiP registry. This information will be used in the development and implementation of the PCB TMDL for the

Delaware River (discussed above). A complete copy of the second annual DelTRiP Report is available on the DRBC Web site at http://www.state.nj.us/drbc/DelTRiP/2007/index.htm.

- **Delaware Estuary Living Shoreline Initiative (DELSI)**: DELSI is a cooperative pilot project of the Partnership and the Rutgers University Haskin Shellfish Research Laboratory. DELSI's primary goal is to stabilize eroding shorelines of tidal marshes by using natural intertidal reef communities comprised of shellfish such as ribbed mussels. Secondary benefits are expected to include enhanced habitat value for fish and crabs, as well as the water quality improvement(s) associated with oyster reefs. The use of shellfish reefs to protect eroding edges of marshes is a relatively new concept, but it has been successfully applied in other parts of the Unites States to combat sea level rise, damage from boat wakes, and other problems that contribute to loss and degradation of marshes.

  This project will utilize all natural materials and only native species. Several different technologies will be used to attract natural recruitment of mussels and other shellfish in New Jersey's Bayshore region. Once established, intertidal shellfish reefs will be monitored to assess which treatment approach performs best with regard to shoreline stabilization, other ecological benefits, and cost. The different treatment strategies will also be deployed in different energy environments to discern which approach is best applied to different erosional forces. Results from the DELSI pilot project will provide economically-effective approaches to combat erosion along much of the seaward edges of tidal marshes across the Delaware Estuary. Funding support for this project is provided by the National Fish and Wildlife Foundation and the Department's Coastal Zone Management Program.

- **National Fish and Wildlife Foundation – Delaware Estuary Watershed Grants Program (DEWGP)**: DEWGP seeks to encourage innovative, community, or locally-based programs or projects that restore important habitats and living resources within the Delaware Estuary Watershed; develop the capacity of local governments, citizens groups, and other organizations to promote community-based stewardship and enhance local watershed-based resource management; and promote a greater understanding of the Delaware Estuary and the interrelationship between the health of the Estuary and the condition of local watersheds. The National Fish and Wildlife Foundation administers DEWGP with key partners including: the Department, the Partnership, the Delaware Department of Natural Resources and Environmental Control, the Pennsylvania Department of Environmental Protection, the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration (National Marine Fisheries Services and the National Ocean Service), USEPA Regions 2 and 3, the William Penn Foundations, and the BP, ConocoPhillips and DuPont Corporations.

  Since its inception in 2004, the NFWF's DEWGP has awarded 119 grants, providing over $3.2 million of federal and private funds that were leveraged with an additional $9 million in matching funds raised by grantees. Projects will achieve significant conservation outcomes, including the restoration of 2,100 acres of wetlands, streams, forests and grasslands for fish and wildlife; the development of 18 watershed management plans to guide and prioritize future local and regional conservation projects; and education, outreach, and training programs offered by local governments and citizen groups that will reach an estimated 213,000 adults and students.

Projects supported by DEWGP in 2007 involve participation from an estimated 3,100 adults and students in community-based, hands-on conservation. Approximately 215 acres of wetland, stream, forest, and meadow habitat will be restored this year. Four sites will be enhanced for oysters and mussels, both signature and declining species of the Delaware Estuary. The projects will also benefit shorebirds along the rural Delaware Bayshore and migratory birds in the urban heart of Philadelphia. A new program focuses on fully integrating natural resource restoration into two residential and commercial developments along urban waterfronts in Pennsylvania and New Jersey. Major financial support for this program is provided by the United States Fish and Wildlife Service, NOAA, settlement funds provided to National Fish and Wildlife Foundation by the United States Attorney for New Jersey and the United States Attorney for Delaware, "Clear into the Future", A DuPont Delaware Estuary Initiative, and the William Penn Foundation.

- **Delaware Bay Oyster Restoration Initiative:** Having received approximately $6 million dollars in federal funding support through the Philadelphia District Office of United States Army Corp of Engineers (FY05-08) and over $3 million dollars in state and local support, this restoration project is clearly demonstrating success across Delaware Bay. In FY05, a total of 280,000 bushels of shell were planted in Delaware Bay waters of New Jersey and Delaware. The FY05 program increased recruitment by about 50 percent in the bay region receiving the shell and supported the first increase in oyster abundance since 2000. Anticipated 2008-2009 harvest from the 2005 shell plantings is estimated at 87,379 bushels valued at $3.49 million ex-vessel (assuming 2006 pricing of $40/bushel), an economic impact estimated at $20.9 million, and a return on investment of $70 for each federal dollar invested. The program has continued this record of success in FY06 and FY07 with an anticipated 20l0-2011 harvest from the 2007 shell plants of 106,496 bushels valued at $9.54 million ex-vessel with an economic impact estimated at $57.3 million and a minimal return of $29 dollars for every federal dollar invested. Partners in this program include representatives from the Rutgers University Haskin Shellfish Research Laboratory, Delaware's Department of Natural Resources and Environmental Control, the Department, DRBC, the Partnership, the Delaware River and Bay Authority, the U.S. Army Corps of Engineers - Philadelphia District, the Delaware and New Jersey Shellfish Industry, and the Cumberland County Empowerment Zone.

- **"Guide to the Natural Communities of the Delaware Estuary":** The CCMP Action Items H3.1 – H3.3 called for the inventory, classification, and mapping of the Estuary's natural communities to inform growth management, land acquisition, and ecological restoration. Working with NatureServe and the states' Natural Heritage Programs, the Partnership completed the natural community classification in 2006. The ecological classification work for the Delaware Estuary has identified over 200 community types in 35 ecological systems. This represents a tremendous amount of biological diversity in the region. In addition to quantifying the Estuary's terrestrial diversity, the classification project also indicated those elements of natural biological diversity that were most threatened and in greatest need of protection and restoration. Findings from the data revealed that 37.5 percent of the Delaware Estuary region's natural communities are rare, imperiled, or critically imperiled and on the brink of being lost. Of these, 81 percent are protected in natural areas, but the remaining natural communities at risk of being lost exist outside of any protected area. Results have also provided indications of the greatest threats to these community types. Not surprisingly, the causes of habitat degradation continue to be development and altered hydrology, agricultural practices, invasive species, fire suppression, and deer browsing.

The information generated by the classification project has been published in a *"Guide to the Natural Communities of the Delaware Estuary"* (Guide) and is available for download from http://www.delawareestuary.org/publications/studiesandreports.asp. The Guide will help restoration practitioners identify their targets and locate systems of reference for better project implementation. Using the Guide will also help identify restoration projects that best meet habitat priorities based on the conservation status of the targeted natural communities.
The final phase of the project, which is currently underway, is the mapping of ecological systems and the development of a conservation lands overlay that can be used to identify opportunities for connecting natural areas for habitat protection. This phase is currently being contracted with NatureServe and The Nature Conservancy. The resulting product will be used in regional models to identify priority locations for conserving rare and endangered species and natural communities.

- **The Corporate Environmental Stewardship Program (CESP)**: continues to provide corporations within the Delaware Estuary region with the opportunity to protect fish and wildlife habitat and improve biodiversity. The program not only helps to improve the environmental health of the Estuary but also increases employee morale and reduces property maintenance costs. Participation is open to any corporation that expresses an interest in environmental stewardship. The voluntary nature of this effort is a key ingredient to its success. Over the past several years, more than 80 companies have been educated about the benefits of habitat restoration activities during workshops held to promote CESP. Today, 24 corporations are actively participating in CESP.

Additional information about the Delaware Estuary Program is available on the Partnership's Web site at www.DelawareEstuary.org.

New York/New Jersey Harbor Estuary Program:

The New York/New Jersey Harbor Estuary includes the waters of New York Harbor and the tidally influenced portions of all rivers and streams that empty into the Harbor. The "core area" of the Harbor, which is generally the most degraded, extends from the tidal waters of the Hudson-Raritan Estuary from Piermont Marsh in New York State to an imaginary line (the Sandy Hook-Rockaway Point Transect) connecting Sandy Hook, New Jersey, and Rockaway Point, New York at the mouth of the Harbor. This core area includes the bi-state waters of the Hudson River, Upper and Lower New York Bays, the Arthur Kill, the Kill Van Kull, and Raritan Bay. In New York, the area includes the East and Harlem Rivers and Jamaica Bay, and in New Jersey, it includes the Hackensack, Passaic, Raritan, Shrewsbury, Navesink, and Rahway Rivers, and Newark and Sandy Hook Bays. The New York Bight is the ocean area extending approximately 100 miles offshore from the Sandy Hook-Rockaway Point Transect to the Continental Slope. Almost 240 miles of sandy shoreline, extending from Cape May, New Jersey to Montauk Point, Long Island, form its landward border. There are several back bays that are located behind the barrier beaches outside the core area of the Harbor.

While the primary focus of the New York/New Jersey Harbor Estuary Program (HEP) is on the core area of the Harbor, the Estuary's watershed encompasses about 16,300 square miles, including much of eastern New York, northern New Jersey, and small parts of western Connecticut, Massachusetts, and Vermont. The quality of the Estuary's waters is affected not only by activities occurring directly in the Harbor and Bight but also by industrial, agricultural, land use, and other individual practices throughout this larger watershed. As rainwater moves over the land in the watershed, it carries with it many potential pollutants that eventually end up in the Estuary – including oil dumped down storm drains, pesticides from farms, lawn fertilizers, oil and gasoline from highway runoff, sewage from failed septic tanks, and sediment from construction projects.

HEP was authorized in 1987, under the National Estuary Program, as a partnership (called the Management Conference) of federal, state, and local governments, scientists, civic and environmental advocates, the fishing community, business and labor leaders, and educators. The mission of the Management Conference was to develop a plan to protect and restore the Estuary. In 1987, Congress also required the preparation of a restoration plan for the New York Bight, the ocean area extending approximately 100 miles beyond Harbor waters. Because the Harbor and Bight are inextricably linked within the larger ecosystem, the two plans were joined. The New York/New Jersey Harbor Estuary was designated as an "Estuary of National Significance" in 1988 by USEPA in response to a request by the two state governors.

Since it was completed in 1996, the primary planning document produced by the HEP has been the Comprehensive Conservation and Management Plan (CCMP). This document was signed by the Governors of New York and New Jersey in the fall of 1997. In June 2008, HEP published a revised Action Plan, which is an updated revision of HEP's 2003 Targets and Goals document. It is organized around five major themes and goals: Clean Up Pollution in the Estuary; Habitat and Ecological Health; Improve Public Access; Support an Economically and Ecologically Viable Estuary and Port; and Public Education and Community Involvement. This is a working document that will be updated periodically to reflect new information, evolving priorities, and progress on recommended priorities. It is meant to be an organizing instrument used to assist with the implementation of the major actions in HEP's CCMP. Recent milestones and initiatives of the HEP are outlined below:

CCMP Action Items:

- Development of Total Maximum Daily Loads (TMDLs): TMDLs are being developed for the Harbor for pathogens, nutrients, and toxics under the auspices of HEP. This is a very complex ongoing effort due to the physical nature of the estuary, varying state standards, policy issues, and large costs associated with potential load reduction actions. HEP is taking a methodical approach to assessment. While the overall process has been open to public participation, it will ultimately be up to the states' and USEPA's regulatory programs to complete the TMDLs.

- Regional Sediment Management: The Regional Sediment Management Work Group was established by the HEP Policy Committee in September 2005, replacing the earlier Dredged Material Management Integration Work Group. This group, chaired by the U.S. Army Corps of Engineers, is nearing completion of a regional sediment management plan that will recommend actions addressing sediment quality, sediment quantity, and dredged material.

- Hudson-Raritan Estuary Ecosystem Restoration Study: In 1999, Congress directed the U.S. Army Corps of Engineers (Corps) to conduct an estuary-wide environmental restoration study throughout the New York/New Jersey Harbor Estuary, which is linked to the dredging and deepening of the Port complex. This study, known as the Hudson-Raritan Estuary Ecosystem Restoration Study (HRE Study), is co-sponsored by the Corps and the Port Authority of New York and New Jersey. The goal of the study is to develop a long-term Comprehensive Restoration Plan (CRP), which will identify environmental improvements that help restore the ecological value of this nationally important resource. The CRP will be the driving force for most, if not all, of the major environmental conservation and restoration activities conducted in the New York/New Jersey Harbor Estuary for many years to come.

  The HRE Study provides a vehicle for implementing many of the HEP CCMP recommendations. As part of the study, the Harbor Estuary Program Management Committee agreed to adopt the HRE's CRP to map out the restoration opportunities that can contribute toward revitalizing the Estuary and its ecological connectivity. This plan will essentially be a "master plan" that any group or organization can use to advance selected restoration initiatives. As part of this effort, the Hudson River Foundation convened a group of experts to establish a set of Target Ecosystem Characteristics (TECs) that more clearly define specific restoration projects within the Estuary. The 12 TECs are now being incorporated into the CRP planning document.

- Public Access: One of HEP's newer initiatives is promoting public access to the waterfront throughout the Harbor. As part of this initiative, HEP provided small grants to 15 groups in 2007 to host activities that would encourage people to visit the Estuary for recreational activities. HEP also worked with several partners to map existing public access points and assess priority areas for the establishment of future access points.

- Habitat Restoration Planning Grants: Since 2005, HEP has made approximately $250,000 available to organizations via competitive grants to assist in restoration planning. The main project currently underway is the construction of an anadromous fish passage on the Rahway River.

- Interactive Habitat Site Map**:** HEP is working with the New York City Open Accessible Space Information System Cooperative (OASIS) to provide information about HEP priority habitat acquisition and restoration sites. OASIS is a partnership of more than 30 federal, state, and local agencies, private companies, academic institutions, and nonprofit organizations and is charged with creating a one-stop, interactive mapping and data analysis application via the Internet to enhance the stewardship of open space in New York City and portions of northern New Jersey. The OASIS Web site is supported by the U.S. Forest Service and created by the New York Public Interest Research Group's (NYPIRG) Community Mapping Assistance

Program. HEP priority habitat acquisition and restoration sites are areas of important ecological value to the Harbor Estuary. Over $30,000,000 has been targeted for acquisition of 1,700 acres, and $64,000,000 for restoration of 650 acres.

- Harbor-wide Water Quality Monitoring Program: In 2002, HEP envisioned a harbor-wide water quality monitoring effort that would provide data on long term trends throughout the Harbor. At the request of HEP, the Interstate Environmental Commission convened an ad hoc group to work with USEPA Region 2, the New Jersey Harbor Dischargers Group (NJHDG), the City of New York, and others to establish a comprehensive monitoring program. Water quality monitoring on the New Jersey side started in 2005. Thirty-three sampling sites are monitored weekly from May through September, and twice monthly from October through April for the following water quality parameters: dissolved oxygen, pH, total suspended solids, fecal coliform bacteria, *Enterococcus* bacteria, Secchi depth, salinity (where applicable), temperature, total Kjeldahl nitrogen, ammonia, nitrite + nitrate, total phosphorus, orthophosphorus, 5-day carbonaceous biochemical oxygen demand, Chlorophyll *a*, and dissolved organic carbon.

- Contamination Assessment and Reduction Project: Another component of HEP, the Assessment Phase of the Contamination Assessment and Reduction Project (CARP), was completed in 2007. This $30 million effort collected an unprecedented amount of new environmental data and developed an associated mathematical model designed to help understand the fate and transport of contaminants in the Estuary. The primary objectives of CARP were to identify the sources, transport, and fate of organic chemicals discharged to the Harbor. This model is now being used by HEP to establish Total Maximum Daily Loads for toxics in the Harbor. Additional information about CARP is available on the project's Web site at http://www.carpweb.org/main.html. Project reports for the various studies conducted as part of the New Jersey Toxics Reduction Workplan for NY-NJ Harbor (the New Jersey component of CARP) are available on the Department's Web site at http://www.state.nj.us/dep/dsr/njtrwp/.

Additional information about the New York/New Jersey Harbor Estuary Program is available on the HEP Web site at http://www.harborestuary.org.

Chapter 5: Water Quality Management

5.13 New Jersey's Wetlands Protection Program

In New Jersey, the chemical, physical, and biological integrity of wetlands is protected under both federal and state laws. Federal protection is provided under sections 303, 401, and 404 of the federal Clean Water Act (the Act). Section 303 provides protection through the antidegradation provisions of the Surface Water Quality Standards. (New Jersey's Surface Water Quality Standards include wetlands in the definition of "surface waters". When USEPA approves the state standards, they become the federal standards for state waters.) Section 401 is designed to allow the state to control any discharges to its waters that may result from the issuance of a federal permit or license, through a certification process. Section 404 addresses and regulates the discharge of dredge and/or fill material into wetlands and other waters of the state. In 1994, New Jersey began implementing its state program in place of the Section 404 program after being granted the authority by USEPA pursuant to Section 404(g) of the Act.

Several New Jersey statutes provide various levels of protection to wetlands, including the New Jersey Water Quality Planning Act (N.J.S.A. 588:11A-1) and the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1). New Jersey protects coastal waters including and the land adjacent to them (including wetlands) under a variety of laws, including the Waterfront Development Law (N.J.S.A. 12:5-3), the Coastal Area Facility Review Act (N.J.S.A. 13:19), and the Wetlands Act of 1970 (N.J.S.A. 13:9A). The Department applies the New Jersey Coastal Permit Program Rules (N.J.A.C. 7:7) and the Coastal Zone Management Rules (N.J.A.C. 7:7E) to determine what may or may not be built pursuant to the above laws. Specific protection is provided for New Jersey tidal wetlands through the Wetlands Act of 1970.

Since July 1, 1988, the State has protected its "inland" wetlands through the Freshwater Wetlands Protection Act (FWPA) (N.J.S.A. 13:9B-1 et seq.). Prior to enactment of the FWPA, several different state laws afforded various levels of protection to "inland" wetlands. One of the goals of the Act was to consolidate the protection of wetlands into one program. It should be noted, however, that the FWPA does not affect wetlands previously regulated under the Wetlands Act of 1970. In addition, the FWPA exempted areas under the jurisdiction of the Hackensack Meadowlands Development Commission. Therefore, activities in the Hackensack area do not require a state freshwater wetlands permit nor are they subject to transition area requirements. However, in areas under the regulation of the Pinelands Commission, freshwater wetland requirements are implemented and applicants must also comply with the Pinelands Comprehensive Management Plan. The most current information regarding the Freshwater Wetlands Protection Act rules is available on the Department's Web site at http://www.nj.gov/dep/rules.

Table 5.13-1 illustrates the net loss of wetlands between 1995 and 2002. While this table indicates a net loss of over 12,000 acres of wetlands throughout New Jersey during this time period, the loss is actually 3100 acres less than indicated in the 2006 Integrated Report. This positive change in net loss of wetlands is attributed to refinements of the Department's land use/land cover database and improved imagery that allowed the Department to better distinguish surface water features from wetlands.

Table 5.13-1: Net Loss in Freshwater Wetlands

Watershed Management Area (WMA)	1995	2002	Net Change
WMA 1: Upper Delaware	49,037	49,094	57
WMA 2: Wallkill	22,445	22,148	-297
WMA 3: Pompton, Wanaque, Ramapo	14,474	14,173	-301
WMA 4: Lower Passaic And Saddle	4,103	3,878	-225
WMA 5: Hackensack And Pascack	7,603	7,129	-474
WMA 6: Upper Passaic, Whippany, And Rockaway	39,472	38,984	-488
WMA 7: Arthur Kill	4,939	4,713	-226
WMA 8: North And South Branch Raritan	26,744	26,229	-515
WMA 9: Lower Raritan, South River, And Lawrence	43,794	41,713	-2,081
WMA 10: Millstone	35,889	34,819	-1,070
WMA 11: Central Delaware	24,937	24,280	-657
WMA 12: Monmouth	43,559	41,848	-1,711
WMA 13: Barnegat Bay	90,161	89,283	-878
WMA 14: Mullica	135,132	135,430	298
WMA 15: Great Egg Harbor	110,184	110,196	11
WMA 16: Cape May	73,500	72,642	-858
WMA 17: Maurice, Salem, And Cohansey	157,944	157,009	-936
WMA 18: Lower Delaware	33,099	31,998	-1,101
WMA 19: Rancocas	64,848	64,112	-737
WMA 20: Assiscunk, Crosswicks, And Doctors	40,681	39,984	-697
Totals	**1,022,543**	**1,009,658**	**-12,886**

Consistent with the federal government's policy of No Net Loss of Wetlands, New Jersey's Freshwater Wetlands Protection Program combines strict regulation of activities in freshwater wetlands with requirements for compensatory mitigation for all Individual Permits and some General Permits. The FWPA also established the Freshwater Wetland Mitigation Council. The Council has the ability to accept a permittee's mitigation obligation by accepting a monetary contribution into the Wetlands Mitigation Fund. The Council can then use the money in the Wetlands Mitigation Fund to finance and manage wetland creation, restoration, enhancement, or preservation projects throughout New Jersey.

Wetlands Program Development

The Department's Division of Land Use Regulation is currently working on a USEPA Section 104(b)(3) grant project entitled, "Proactive Assessment: Freshwater Wetlands Protection in New Jersey: Demonstration of a Regulatory Environmental Outcome Wetland Program." This project consists of a pilot study that will enhance four aspects of the Department's existing Wetlands Protection Program:

1) **Compensatory Mitigation** - update the WETMIT database in order to generate reports on the status of compensatory wetland mitigation projects in New Jersey.

2) **Critical Habitat Retention** - implement additional protections to critical habitats to ensure that wetlands of significant ecological value and irreplaceable quality are not lost in New Jersey.

3) **Vernal Pool Protection** - identify and map vernal pools and associated animal species dependent upon these ephemeral wetlands in order to preserve both the quality and acreage of vernal habitats in the state.

4) **Classification of Wetland Communities** - develop of a database of wetland ecological community plot data, create ranking specifications for rare wetland types, and develop "A Guide to the Wetland Communities of New Jersey".

These four program areas cover five of the USEPA grant categories necessary to qualify as a funded pilot project, as illustrated in Table 5.13-2.

Table 5.13-2: New Jersey Freshwater Wetlands Protection Program Components

USEPA GRANT CATEGORIES	Compensatory Mitigation	Critical Habitat Retention	Vernal Pool Protection	Classification of Wetland Communities
Restoration	x			x
Inventory/Mapping		x	x	x
Monitoring/Assessment	x	x	x	x
Coordination/Stewardship	x	x	x	x
Regulatory	x	x	x	x

The pilot project is intended to improve the Department's ability to achieve the no net loss/net gain goal for years after this pilot program is completed. During the three-year grant project, the Department hopes to achieve progress in arresting the loss of wetland resources and restoring, enhancing, and preserving existing wetlands.

Wetlands Mitigation:

Compensatory mitigation is required for all Individual Permits as well as for General Permit activities in wetlands that involve investigation, cleanup, or removal of hazardous materials; closing of landfills; or redevelopment projects. Mitigation of wetlands can be achieved through wetland creation, restoration, and enhancement. Other forms of mitigation include upland preservation to benefit a freshwater wetland ecosystem; purchase of mitigation credits from a bank that has already been established and is comprised of wetland creation, restoration, and/or enhancement; monetary contribution to the Wetland Mitigation Fund; or donation to the Freshwater Wetland Mitigation Council of land that is a valuable component of a wetland or surface water ecosystem.

Every permit that requires compensatory mitigation includes performance standards that define a successful wetland mitigation project. The Department has established a checklist of standard requirements for submittal of a wetland mitigation proposal as well as standard monitoring requirements when conducting wetland creation, restoration, and/or enhancement. In order for a mitigation project to be approved it must have a high probability of long-term success and, at a minimum, this requires the following: adequate dedicated financial resources to complete the project; a design that takes advantage of and fits into the watershed; adequate hydrology; adequate soils to support a hydric community; and long term stewardship to maintain the mitigation area.

Wetlands Mitigation Council:

The FWPA establishes a Wetlands Mitigation Council (Council). The Council is comprised of seven members: the Commissioner of Environmental Protection or his/her designee (who serves *ex officio*) and six members of the general public appointed by the Governor (two appointed from persons recommended by recognized building and development organizations, two appointed from persons recommended by recognized environmental and conservation organizations, and two appointed from institutions of higher learning in the State). The Council is responsible for the management and disbursement of dollars from the Wetland Mitigation Fund to finance wetland creation, restoration, enhancement, or preservation projects. The Council has the power to purchase land to provide areas for enhancement or restoration of degraded freshwater wetlands, to engage in the enhancement or restoration of degraded freshwater wetlands on any public lands, including public lands other than those acquired by the Council, and to preserve freshwater wetlands and transition areas determined to be of critical importance in protecting freshwater wetlands.

To date, the Council has received $6,187,346.10 from 49 applicants as compensation for the loss of 53 acres of wetlands, and has awarded $6,547,607.16 in wetland mitigation grants from the Wetland Mitigation Fund to preserve over 840 acres of land and restore or enhance almost 200 acres of wetlands (see Table 5.13-3).

Table 5.13-3: Freshwater Wetlands Mitigation Totals

WMA	Amount Contributed	# Projects	Impacts (acres)	Amount Awarded	Land Preserved (acres)	Restoration/ Enhancement (acres)
1	$6,252.00		0.04			
2				$1,002,880.00	120	
3	$20,742.75		0.09			
4	$9,500.00		0.25			
5	$1,585,651.75	4	12.822	$1,833,444.00		34.6
6	$524,225.00	7	3.2565			
7	$1,218,641.26	6	4.844	$100,000.00		1.6
8				$323,260.00		2
9	$162,360.00	3	2.69			
10	$318,627.00		1.486			
12	$160,292.00	5	1.408	$770,187.16		107
13	$755,614.84	22	8.652	$204,000.00		6
14	$28,297.50		0.065			
15	$174,044.00		0.955			
16	$4,034.00		0.0441	$1,439,432.00	580	8
17	$166,635.00	2	2.07	$669,404.00	141.1	40
18	$54,902.00		0.25	$200,000.00		
19	$3,500.00		0.35			
20	$6,500.00		0.14			
State	$987,527.00		13.75			
Totals	**$6,187,346.10**	**49**	**53.1626**	**$6,547,607.16**	**841.1**	**199.2**

Wetlands Research:

To fulfill the USEPA mandate for states to establish wetlands monitoring programs by 2014 for waters of the United States, and to explore metrics for water quality reporting (rather than qualitative assessment methods), the Department, in collaboration with Rutgers University, has been undertaking research focusing on quantitative wetland biological assessment methods. A goal of this research is to explore development of a wetlands index of biotic integrity (IBI) for New Jersey. To date, the research has focused on riparian forested wetlands, primarily vegetative species and macroinvertebrates, including possibly linking to the Department's macroinvertebrate monitoring network for streams (AMNET). Initial results were published in 2006 and are available on the Department’s Web site at http://www.state.nj.us/dep/dsr/wetlands/. Final results of the study are expected in 2008.

The Department completed six wetland research studies funded by USEPA’s State Wetlands Development Protection Grants between 1997 and 2007, resulting in the establishment of 312 monitoring plots at 220 sites in 58 rare wetland community types in New Jersey. The Department’s current Program Development Grant includes funding to populate a database of wetland monitoring plots and to complete “A Guide to the Wetland Communities of New

Jersey." Additional geo-referenced wetland vegetation monitoring plots are being established in rare wetlands statewide as part of this study. All of the monitoring plots occur in reference wetland sites and provide a baseline of vegetation, soils, hydrology and other environmental data. Additional information on these wetland reports is available from the Department's Natural Heritage Program in the Office of Natural Lands Management and on the Department's Web site at http://www.nj.gov/dep/parksandforests/natural/heritage/index.html.

Described below are additional activities performed by the Department's Endangered and Nongame Species Program (ENSP) that are considered in monitoring, assessment, and management of New Jersey's wetlands resources:

- **Wood turtle:** State Wildlife Grant received to determine habitat use and home range size;
- **Longtail salamander:** State Wildlife Grant received to study distribution; and
- **Bog Turtle:** State Wildlife Grant and a variety of other federal funds received to conduct habitat assessments, restoration, and population monitoring.

Landscape Project*:* ENSP, in collaboration with multiple partners, continues to update its Landscape Project: a landscape level approach to protect imperiled species and critical wildlife habitat, including wetlands species and associated habitats. The Landscape Project has been designed to provide users with peer-reviewed, scientifically sound information that is easily accessible and can be integrated with the planning, protection and land management programs of nongovernmental organizations and private landowners and at every level of government – federal, state, county, and municipal. ENSP has developed maps that identify critical areas for imperiled species by landscape region (Skylands, Delaware Bay, Piedmont Plains, Pinelands, and Coastal) based on their habitat and land-use classification. Mapping products are currently being updated from 1995 to 2002 aerial photography and models are being adapted to a finer classification of land cover type. An updated Version 3.0 (Highlands) of the Landscape Project has gone through an extensive peer review process. Landscape maps and overlays provide a basis for proactive planning, such as the development of local habitat protection ordinances, zoning to protect critical wildlife areas, management guidelines for imperiled species conservation on public and private lands, and land acquisition projects. Additional information about the Landscape Project is available on the Department's Web site at http://www.state.nj.us/dep/fgw/ensp/landscape/.

Herpetofauna Projects: The Department's ENSP has three citizen-science based herpetofauna conservation projects to identify wetlands-associated species. Herpetofauna serve as surrogates for water quality. Through peer-review journal publications, it is quite clear that most amphibians and some reptiles are excellent bio-indicators for water quality.

The **New Jersey Herptile Atlas**, through the efforts of ENSP and many volunteers, is collecting data on the specific location and abundance of all reptile and amphibian species throughout the State. With over 300 volunteers participating in this project statewide, these data will be used to map the critical habitat, abundance, and distribution of New Jersey's reptiles and amphibians. Maps created as part of this project will provide ENSP with the necessary information to inform planning agencies of the status of New Jersey's native herptile species, thus allowing all agencies to better plan for the State's wildlife conservation. Additional information is available on the Department's Web site at http://www.njfishandwildlife.com/ensp/herpatl.htm.

The **Calling Amphibian Monitoring Program** uses volunteers to survey for frogs and toads along 63 transects throughout the State. Each transect consists of 10 georeferenced survey points along a driving survey route that is a maximum of 15 miles long. Transects are surveyed three times a year (between March and July) and the data collected allow for trend analysis of New Jersey's frog and toad populations.

The **Vernal Pool Survey Project** uses trained volunteers to confirm locations of vernal habitats and survey these locations for herpetofauna. Rutgers University's Center for Remote Sensing and Spatial Analysis (CRSSA) has identified over 13,600 potential vernal pools throughout the State and has developed a website featuring interactive maps with potential vernal pool data layers. ENSP staff and volunteers have collected data on approximately 4,041 vernal habitats and have increased the number of certified vernal habitats from 341 in 2002 to 1186 to date. Additional information is available on the Department's Web site at http://www.njfishandwildlife.com/ensp/vernalpool.htm.

Additional information about the Department's Wetlands Programs is available on the Department's Web site at http://www.nj.gov/dep/landuse/fww.html.

Chapter 5: Water Quality Management

5.14 Enforcement

Compliance and enforcement plays a critical role within the Department by deterring violations that would otherwise threaten our environment and the health of New Jersey's citizens. To encourage compliance and environmental stewardship, the Department seeks innovative ways to provide incentives, information, and assistance to the regulated community and the interested public. To ascertain compliance, the Department employs site inspections and detailed reviews of reported information. To ensure compliance, the Department puts violators on notice, takes administrative actions, levies penalties, and where necessary, works cooperatively with criminal prosecutors.

The Department's Division of Water Compliance and Enforcement is responsible for ensuring compliance with the State's water programs. A particular focus is placed on inspections of wastewater discharge and community drinking water supply facilities. Activities include:

- Provide compliance assistance;
- Investigate complaints and notifications of unauthorized activities;
- Conduct inspections;
- Issue enforcement documents, which may include assessed penalties;
- Assist the Attorney General in developing enforcement cases and testify in court;
- Negotiate compliance schedules and penalty settlements; and
- Monitor compliance with all NJPDES permits for surface water, ground water and indirect discharges to POTWs.

In 1990, the Legislature enacted substantial amendments to the Water Pollution Control Act (WPCA), commonly known as the Clean Water Enforcement Act, P.L. 1990, c. 28 (CWEA). The CWEA requires the Department to inspect permitted facilities and municipal treatment works at least annually. Additional inspections are required when the permittee is identified as a significant noncomplier. The CWEA also requires the assessment of mandatory minimum penalties for violations of the WPCA that are considered serious violations and for violations by permittees designated as significant noncompliers. The CWEA requires the Department to submit a report on the implementation of the CWEA's requirements to the Governor and the Legislature by March 31 of each year. The statute also specifies the items that the Department must include in the report. The Department has organized the required information into several categories, including Permitting, Enforcement, Delegated Local Agencies, Criminal Actions, Fiscal, and Water Quality Assessment. Copies of these CWEA reports are available on the Department's Web site at http://www.nj.gov/dep/enforcement/report-cwea.html.

Additional information about the Water Compliance and Enforcement is also available on the Department's Web site at http://www.nj.gov/dep/enforcement/water.html.

Chapter 6: Public Health Concerns

This chapter provides information on public health concerns related to water quality in New Jersey. These concerns include protection of drinking water supplies (source water protection and emerging contaminants) and consumption advisories for fish and shellfish.

6.1 Source Water Protection

As a requirement of the 1996 Amendments to the Safe Drinking Water Act, all states were required to establish a Source Water Assessment Program (SWAP). The purpose of SWAP is to provide for the protection and benefit of public water systems and to increase public awareness and involvement in protecting the sources of public drinking water. New Jersey's SWAP Plan incorporates the following four fundamental steps:

1. Determine the source water assessment area of each ground and surface water source of public drinking water.
2. Inventory the potential contamination sources within the source water assessment area.
3. Determine the public water system sources' susceptibility to regulated contaminants.
4. Incorporate public education and participation.

The Department, in conjunction with the United States Geological Survey (USGS), performed source water assessments to predict the susceptibility of source water for all community water systems and noncommunity water systems in New Jersey. Based on these assessments, more than 50 percent of the unconfined wells in New Jersey were rated as highly susceptible to nutrients and VOCs. Confined wells received a high susceptibility rating only for disinfection byproduct precursors (27 percent of confined wells rated highly susceptible). When reviewing the results of the medium susceptibility ratings for confined wells, a high percentage of the wells were moderately susceptible to disinfection byproduct precursors, inorganics, and radionuclides. For surface water, more than 50 percent of the intakes in New Jersey were rated as highly susceptible to inorganics, disinfectant byproduct precursors, and pathogens. Surface waters are subject to various sources of microbial contamination runoff containing fecal matter. For the purpose of the source water assessments, the drinking water derived from all surface water intakes was assumed to be highly susceptible to contamination by pathogens.

The Department has generated individual reports for each of the 606 community water systems and 3533 noncommunity water systems (number of systems in the 2003 inventory). These reports provide the susceptibility ratings for each of the water system's sources to each contaminant category. The reports and supporting documents are available to the public and can be obtained by contacting the public water system, or on the Department's Web site at http://www.nj.gov/dep/swap/assessments.htm. Several new wells have been installed since the source water assessments were performed and are now in use. The Department anticipates assessing these new sources and revising the source water assessment reports for those systems to reflect new developments.

Source water assessments provide the foundation for source water protection. Source water protection focuses on preserving and protecting the public drinking water source, particularly from the contaminants to which the source is most vulnerable, as identified in the source water assessments. The information developed from the SWAP provides communities with the tools necessary to begin protecting their valuable drinking water source. Currently, the Department does not have specific source water protection regulations, but the Department strongly encourages local municipalities to implement source water protection, including protection plans and well head protection ordinances. Several New Jersey municipalities have taken steps toward protecting their drinking water sources by adopting well head protection ordinances. The Department has assisted many of these townships in developing their ordinances to ensure that their source waters are protected. All well head protection ordinances prohibiting underground storage tanks must be reviewed by the Department to ensure that they are in compliance with State regulations. Additional information about the Source Water Assessment Program is available on the Department's Web site at http://www.nj.gov/dep/swap/index.html.

Chapter 6: Public Health Concerns

6.2 Emerging Contaminants

Emerging contaminants can be broadly defined as any synthetic or naturally occurring chemical or any microorganism that is not commonly monitored in the environment but has the potential to enter the environment and cause known or suspected adverse ecological and(or) human health effects. In some cases, release of emerging chemical or microbial contaminants to the environment has likely occurred for a long time, but may not have been recognized until new detection methods were developed. In other cases, synthesis of new chemicals or changes in use and disposal of existing chemicals can create new sources of emerging contaminants.[3]

Since 1998, the U.S. Geological Survey (USGS) has been developing analytical capabilities to measure pharmaceuticals and other organic wastewater contaminants (OWCs) in the environment. Currently, the USGS can analyze more than 140 OWCs using a variety of LC/MS and GC/MS techniques. To date, over 500 samples from across the United States, representing a wide range of climatic and hydrologic conditions, have been analyzed for OWCs. Some of the most frequently detected compounds include cholesterol (plant and animal steroid), DEET (insect repellent), caffeine (stimulant), triclosan (antimicrobial disinfectant), and tri(2-chloroethyl)phosphate (fire retardant). Prescription pharmaceuticals and antibiotics also have been commonly detected at *n*g/L concentrations. There is now substantial evidence that some of these compounds affect the health of wildlife, influencing hormonal and reproductive functions.

Early research focused on broad-scale reconnaissance studies, providing the first nationwide data on the occurrence of OWCs in water resources of the United States. These results documented that OWCs are commonly present in streams and, to a lesser extent, aquifers, particularly at sites that are immediately downstream or down gradient of contaminant sources. Detection of multiple OWCs was common, with as many as 38 OWCs being found in a single water sample. These results indicate that synergistic or additive effects from mixtures of OWCs will need to be evaluated. Subsequent research focused on sources of OWCs and their fate and transport. Samples from municipal wastewater treatment plants and animal waste storage lagoons indicate that both human and animal waste can be sources. Early results indicate that concentrations of OWCs generally increase as the percent of streamflow derived from municipal discharges increases. Recent research has shown that bed sediment can also act as a reservoir of pharmaceuticals and other OWCs to the environment.

Research is documenting with increasing frequency that many chemical and microbial constituents that have not historically been considered as contaminants are present in the environment on a global scale. These "emerging contaminants" are commonly derived from municipal, agricultural, and industrial wastewater sources and pathways. These newly recognized contaminants represent a shift in traditional thinking as many are produced industrially yet are dispersed to the environment from domestic, commercial, and industrial uses.

[3] USGS. 2008. http://toxics.usgs.gov/regional/emc/index.html

The Department's Division of Science, Research and Technology has contracted with the USGS to conduct the **Emerging Contaminants Project**. The major goal of this project is to provide information on these compounds for evaluation of their potential threat to environmental and human health. To accomplish this goal, the research activities of this project are to: (1) develop analytical methods to measure chemicals and microorganisms or their genes in a variety of matrices (e.g. water, sediment, waste) down to trace levels, (2) determine the environmental occurrence of these potential contaminants, (3) characterize the myriad of sources and source pathways that determine contaminant release to the environment, (4) define and quantify processes that determine their transport and fate through the environment, and (5) identify potential ecologic effects from exposure to these chemicals or microorganisms. Additional information on project research on emerging contaminants is available on the USGS Web site at http://toxics.usgs.gov/regional/emc/index.html.

Additionally, the NJ Water Monitoring Coordinating Council is establishing a subcommittee to focus on various aspects of emerging contaminants – research, risk assessment, methods and quality control, cost analyses, data management, etc. Additional information on the NJ Water Monitoring Council is available on the Department's Web site at http://www.state.nj.us/dep/wms//wmcchome.html.

Chapter 6: Public Health Concerns

6.3 Consumption Advisories

Consumption advisories for fish and shellfish contaminated with toxic chemicals were first announced in New Jersey in the 1980s. Data from studies conducted by the Department's Division of Science, Research and Technology (DSRT) revealed that eating certain species of fish and shellfish from some waters of the State posed unacceptable health risks. These advisories are of particular importance to pregnant women, nursing mothers, and young children, because polychlorinated biphenyls (PCBs), dioxin, and mercury have been shown to cause a number of serious health effects, including effects on the immune system, nervous system, developmental problems, and/or cause cancer. Current consumption advisories are listed on the Department's Web site at www.FishSmartEatSmartNJ.org.

Consumption advisories are developed on a pollutant-specific basis and, when multiple pollutants are present, are based on the contaminant resulting in the most restrictive advisory. Advisories are typically issued for elevated levels of mercury, PCBs, chlorinated pesticides, or dioxin compounds. Fish tissue samples are often analyzed for specific contaminant(s) in order to gain a more complete picture of potential contaminants in multiple trophic levels. For example, the current consumption advisories for freshwater fish are predominantly based on elevated mercury concentrations in fish tissue. However, current research has shown that certain lower trophic level freshwater species (i.e., common carp, catfish, and American eel) can accumulate a variety of chlorinated organic contaminants as well. Currently, a limited number of these lower trophic level freshwater species are being analyzed for PCBs (as congeners) and chlorinated pesticides (chlordane, DDD, DDE, and DDT, and others). In addition, some freshwater fish samples collected from specific locations are being analyzed for dioxin and furan compounds. All marine and estuarine species of fish are analyzed for chlorinated organic contaminants. In 2002, an initial series of samples were analyzed for PBDE (flame retardant) compounds and the Department has since continued looking at PBDEs on a screening basis, analyzing a small subsample each year to identify trends and compare to data available from other states and countries.

The Department, in conjunction with the Department of Health and Senior Services, has published "statewide" advisories in coastal waters for striped bass, bluefish, and American eel; and in freshwaters for largemouth bass, smallmouth bass, chain pickerel, yellow bullhead, brown bullhead, and sunfish. In addition, a general statewide advisory has been issued for all freshwater fish and waterbodies not covered by a specific advisory. The Department has used "waterbody-specific" fish advisories to identify waterbodies impaired for fish consumption in the Integrated Report (see Chapter 4, Section 4.6 "Fish Consumption Use").

Toxics Monitoring

A statewide "Routine Monitoring Program for Toxics in Fish" was developed by the Department to update the human health consumption advisories for certain foodfish species and/or geographic areas. Four years of the five-year monitoring program have been completed; the final round of monitoring requires additional funding. The Department is currently reviewing the Year

3 draft report and waiting for submission of the Year 4 report. Year 1 and 2 reports are available on the Department's Web site at http://www.state.nj.us/dep/dsr/njmainfish.htm#research. Results of this monitoring effort will be used to enhance the existing contaminant database used to develop fish consumption advisories and identify chemical contaminant levels.

Trends

Available data indicate that PCB levels have declined in some species and regions examined since the 1979 ban on PCB manufacturing (see Figures 6.3-1 and 6.3-2). Both lines show a steady decline in PCB concentrations, although striped bass data show a much steeper decline in PCB concentrations. Hazardous waste site identification and cleanup, and implementation of proper disposal methods for toxics, should lead to the continued decline of contaminants such as PCBs in fish.

Figure 6.3-1

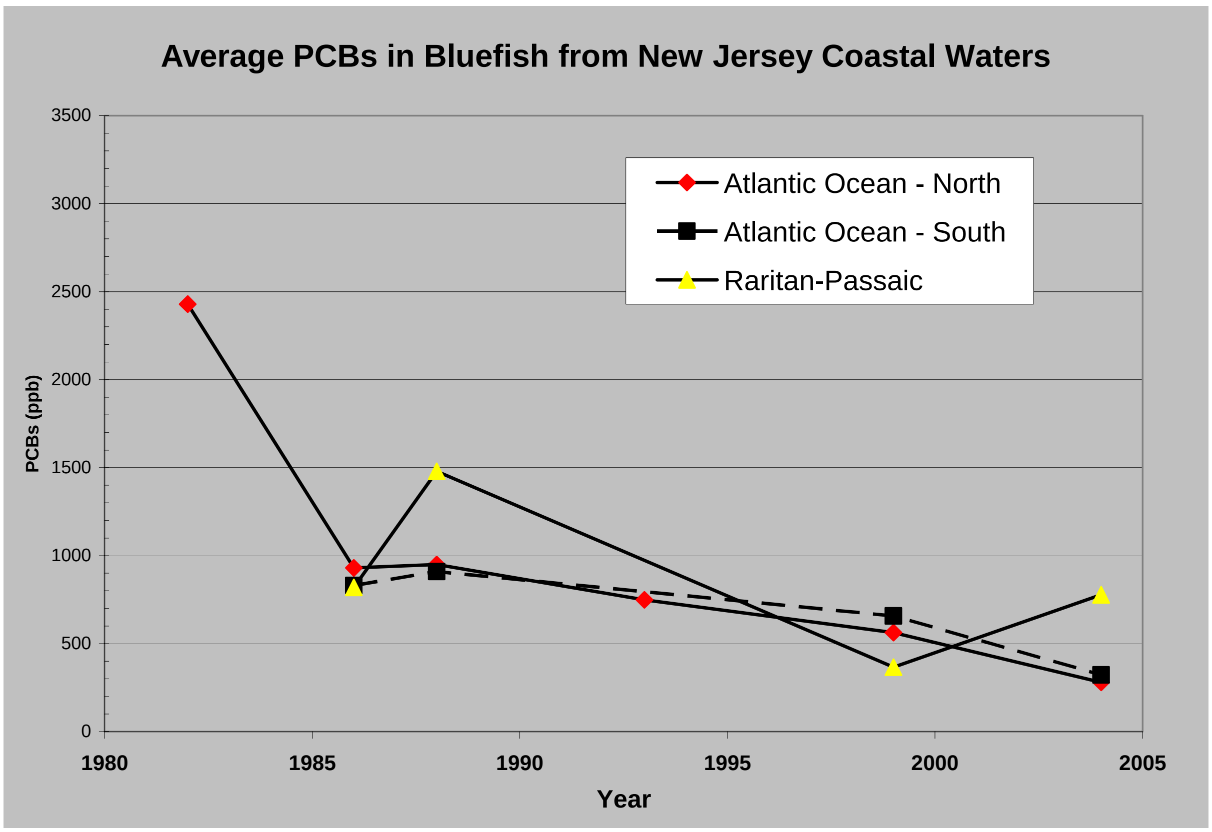
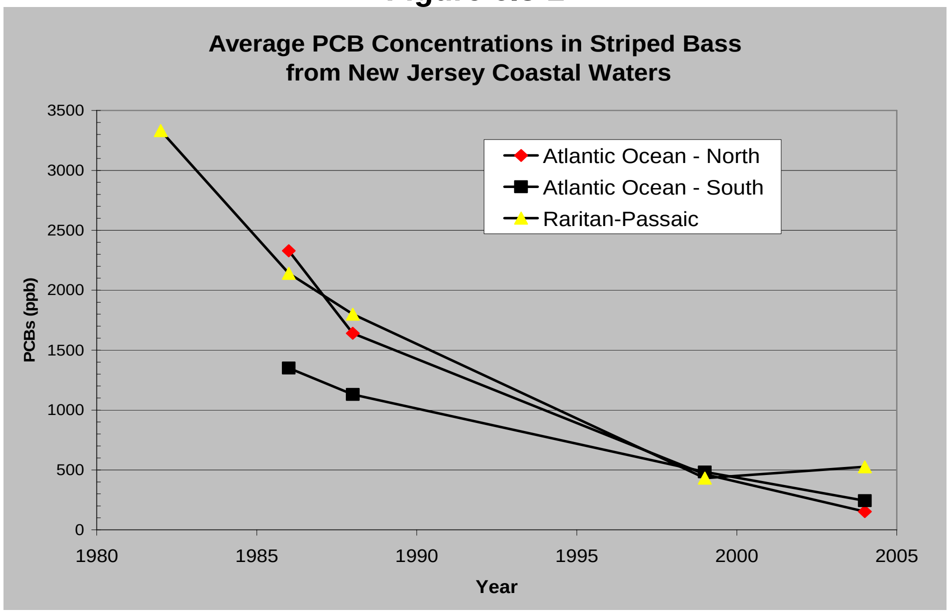
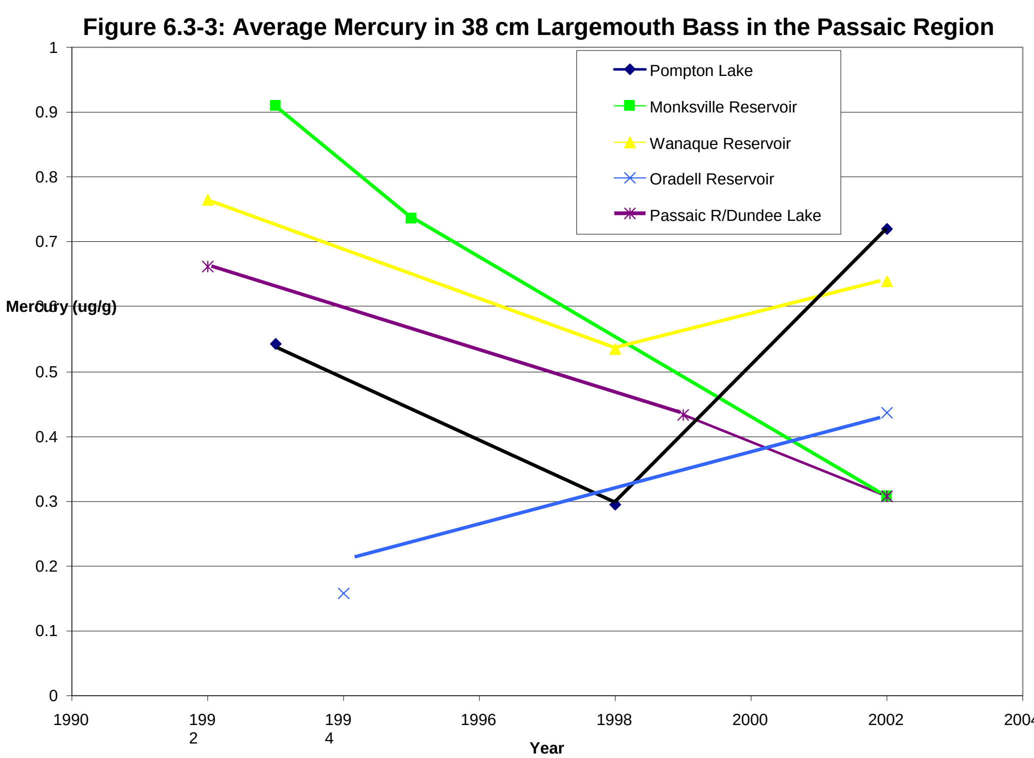


Figure 6.3-2

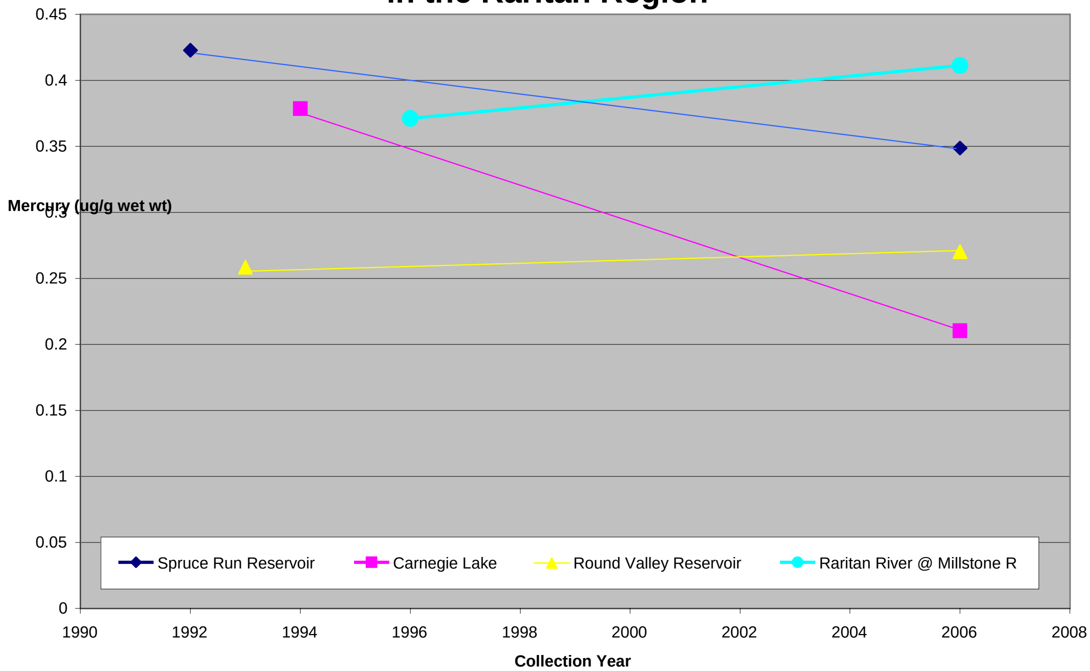


Mercury fish data collected since the 1990s have shown no consistent trend in mercury concentrations in largemouth bass in the Passaic or Raritan Regions (see Figures 6.3-3 and 6.3-4). Additional data are needed to determine long-term trends in mercury levels in fish; however, reductions of mercury releases from incinerators and other sources, as well as planned reductions in releases from in-state power plants and industrial sources, will reduce mercury loadings from local sources. These reductions may not sufficient to eliminate the need for fish consumption



advisories due to their persistence in the environment and expanded monitoring and assessment.

Figure 6.3-4: Average Mercury for 38-cm Largemouth Bass in the Raritan Region



As the Department expands its monitoring program and more waters are assessed, more of these toxic chemicals will be detected and added to the 303(d) List. Since these pollutants persist in the aquatic environment at levels that exceed water quality criteria, and may be discharged by sources not covered by the federal Clean Water Act, a more comprehensive national strategy for source reduction is needed to achieve use attainment in New Jersey.

A Bacterial Pathogen of Concern - *Vibrio parahaemolyticus*

On two occasions between 2002 and 2005, New Jersey closed roughly 100-square miles of the Delaware Bay to shellfish harvest due to the presence of a naturally occurring[4] bacterial pathogen called *Vibrio parahaemolyticus*. In July 2002, the New Jersey Department of Health and Senior Services declared an illness outbreak when two confirmed cases of *Vibrio parahaemolyticus* were attributed to New Jersey oysters harvested from Delaware Bay. Another closure occurred in June of 2005 when routine monitoring showed that levels of *Vibrio parahaemolyticus* in oysters in a portion of Delaware Bay exceeded the federal Food and Drug Administration guidance levels for that pathogen.

4 Naturally occurring means that this pathogen is not related to human waste or pollution. It is an organism that is normally present in bay waters in low numbers. Under ideal conditions (primarily warm temperatures), this organism thrives both in the water and in the shellfish tissue after harvest of the shellfish.

It is important to emphasize that this pathogen is not related to pollution. It is normally present in low numbers in coastal waters throughout the country. Under certain conditions, the pathogen thrives and increases its presence in the oysters. Factors that favor the pathogen's growth are not fully understood; however, research has shown that elevated temperature (both in the water and in the oyster after it is harvested) plays a significant role. The Department has implemented a number of temperature control measures, such as restricting harvesting during the warmest times of the day and covering harvested shellfish with tarps to reduce exposure to heating by the sun. These measures, along with the precautionary closure of certain shellfishing waters, appear to be working. There have been no confirmed *Vibrio parahaemolyticus* illnesses attributed to New Jersey oysters since 2002.

Additional information on Shellfish Closures and Reopening is available on the Department's Web site at http://www.state.nj.us/dep/wms/closures.html. For more information on the shellfish harvesting use assessment, see Chapter 4, Section 4.7 of this Report.

Chapter 7: Cost/Benefit Analysis

New Jersey contains a wide variety of water resources. The State's 7,505 square miles of land area includes 127 linear miles of coastline, 18,126 miles of rivers and streams, and 52,804 acres of lakes and ponds larger than two acres. In addition, there are almost 1 million acres of freshwater and tidal wetlands and 714 square miles of coastal waters (see Chapter 1). New Jersey faces no single greater challenge than providing a clean, safe, and plentiful supply of water for its growing population. Past drought emergencies have provided sobering lessons about the consequences faced if streams, rivers, and reservoirs are not protected. A steady supply of water to support both a burgeoning population as well as the state's ecosystems must be guaranteed.

The USEPA Guidance for Year 2008 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act (October 12, 2006) requires New Jersey to provide, as part of the Section 305(b) component of the Integrated Report, "an estimate of the environmental, economic, and social costs and benefits needed to achieve the objectives of the CWA and an estimate of the date of such achievement." However, as USEPA acknowledges, this information is difficult to obtain due to the complexities of the economic analysis involved. Therefore, USEPA recommends that, until such time as comparable procedures for evaluation of costs and benefits are in wider use, states should provide a brief narrative that includes specific information, where available, on costs associated with construction, implementation, and operation and maintenance of pollution control measures and the associated benefits derived from the extent of streams and lakes improved from impaired to attainment, increased fishing and swimming use of streams, lakes and beaches, as well as reduced cost of drinking water treatment where intake water quality has improved.

Costs Associated With Water Pollution Control Activities:

The Department is responsible for implementing most of New Jersey's Water Pollution Control Activities. As described in Chapter 5, many of these programs are located within the Division of Watershed Management and the Water Monitoring and Standards Program. In addition, the Division of Water Quality is responsible for administering the New Jersey Pollutant Discharge Elimination System (NJPDES) program that regulates the discharge of pollutants to surface and ground waters of the State.

The Department's pollutant control authority is derived from the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., pursuant to which New Jersey qualifies for and has primary responsibility under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) for the administration of the National Pollutant Discharge Elimination System (NPDES). The Department is authorized to "establish and charge reasonable annual administrative fees, which fees shall be based upon, and shall not exceed, the estimated cost of processing, monitoring and administering the NJPDES permits." Fees are assessed to cover the Department's costs to issue and manage NJPDES permits, including water quality monitoring, modeling, inspections, compliance evaluations, and general administrative costs of the NJPDES program including regulatory support, data processing, and budgeting.

Revenue from NJPDES permit fees, New Jersey's Corporate Business Tax, and federal funds are used to cover the State's costs associated with implementing most of the water pollution control activities. In State Fiscal Year (SFY) 2007, NJPDES fees were expected to cover 192 Full Time Equivalents (FTEs) for a total cost of over $19.8 million. The Enforcement component of the State's Water Pollution Control Program for SFY07 covered an additional 25 FTEs, at a cost of $2.5 million. The Corporate Business Tax and federal grant funds covered 121 FTEs, at a cost of $14 million.

Table 7.1: Cost of New Jersey Water Pollution Control Activities, SFY 2007

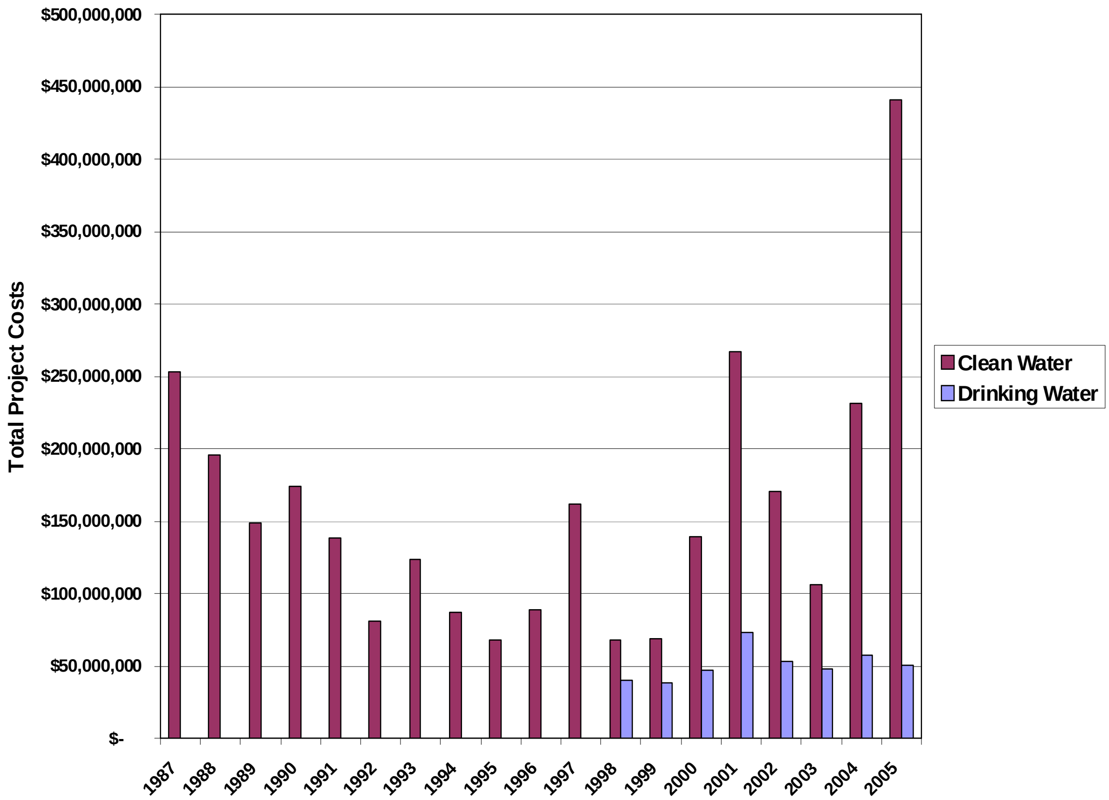
Programs*	**FTEs**	**Cost (in millions)**
NJPDES Program	192	$19.8
Enforcement	25	$ 2.5
Other (DWM/WMS)	121	$14
Total	**337**	**$36.3**

*This does not include the Division of Water Supply, NJGS, EIT or Green Acres.

Public investment to improve water quality in New Jersey has been substantial. Since 1987, more than $3 billion has been spent to upgrade wastewater treatment facilities, reduce infiltration/inflow, control discharges from Combined Sewer Overflows (CSOs), construct sludge handling facilities, improve stormwater runoff, and close landfills (see Figure 7-1 on the following page). The State has assisted New Jersey municipalities, counties and sewerage entities with grants or loans for sewage treatment projects through the State's Environmental Infrastructure Trust. Starting in 1998, the Environmental Infrastructure Trust (NJEIT) began providing funding to improve drinking water quality.

In 2005, the NJEIT granted 51 loans totaling over $280 million for Clean Water projects, Clean Water Land Acquisitions, and Drinking Water Projects. NJEIT granted almost double that amount in 2006, when it granted 48 loans totaling over $481 million. (See Chapter 5, Section 5.9 for a detailed breakdown of the loan awards).

Figure 7.1: Environmental Infrastructure Trust Financing Loan History 1987-2005



Benefits of Water Pollution Control Measures

Unlike the costs of cleanup, the benefits of improved water quality are not easily measured in monetary terms. Maintenance of high quality potable water supplies is critical to the health and economic well being of every resident. Clean water for swimming, fishing, and boating are quality of life issues that also have clear economic benefits associated with recreation, marine industries and resultant tax revenues. Cleaning up abandoned and contaminated urban sites has broad implications for the health of nearby residents, the economic revitalization of New Jersey's cities, and the protection of sensitive wetlands and water resources. Economic benefits of water quality improvements, while difficult to quantify, include increased opportunities for water-based recreational activities, enhanced commercial and sport fisheries, recovery of damaged aquatic environments, and reduced costs of water treatment to various municipal and industrial users.

As explained in Chapter 3, Section 3.3, a trend analysis of some important water quality characteristics was conducted for the time period 1984 through 2004 at 36 monitoring sites located around the State. These sites were selected because they were identified as monitoring sites with available long-term data for the study’s 20-year time period. All of the sites are in the

USGS/NJDEP Ambient Surface Water Monitoring Network and were sampled at least quarterly. Water quality characteristics that were assessed in the trends analysis included dissolved oxygen, nutrients (total nitrogen, total ammonia, nitrate, and total phosphorus), dissolved solids, and specific conductance.

Results from the assessed stations show that levels of nutrients and dissolved oxygen are improving and/or are stable. Excess nutrients can accelerate the growth rate of aquatic algae and vegetation. Dissolved oxygen is necessary for almost all aquatic life; consequently concentrations of dissolved oxygen in water provide one indicator of the health of aquatic ecosystems. Water bodies affected by excessive primary production are characterized by significant algae and weed growth and can experience episodes of low dissolved oxygen. Low dissolved oxygen episodes can occur when algae die off and bacteria consume the dissolved oxygen in the process of decomposition.

Pathogens impact recreational uses and shellfish harvest. Sources include stormwater runoff, Combined Sewer Overflows (CSOs), wildlife, failing septic systems and broken sewer lines. The Department has implemented a municipal stormwater management program that regulates all 566 municipalities within the State, as well as public complexes and highway systems, typically under NJPDES stormwater general permits. This program should result in the reduction of pathogens conveyed through stormwater discharges by requiring stormwater management plans and implementation of specific best management practices (BMPs). Between April 1, 2005 and April 1, 2006, stormwater pollution prevention plans (SPPPs) were submitted for 97% of the applicable municipalities, 91% of the regulated highway agencies, and 86% of the regulated public complexes. Implementation of the street sweeping BMP by these agencies resulted in approximately 360,000 miles of roads swept and the removal of 170,000 tons of material. Implementation of the catch basin cleaning BMP resulted in the inspection and cleaning of approximately 205,000 catch basins and the removal of over 13,000 tons of material. Implementation of these two BMPs alone resulted in the removal of over 183,000 tons of material in one year that would otherwise have been discharged via storm sewers to waters of the State, carrying pathogens and other pollutants along with them. (See Chapter 5, Section 5.4 “Municipal Stormwater Permitting Program” for additional information).

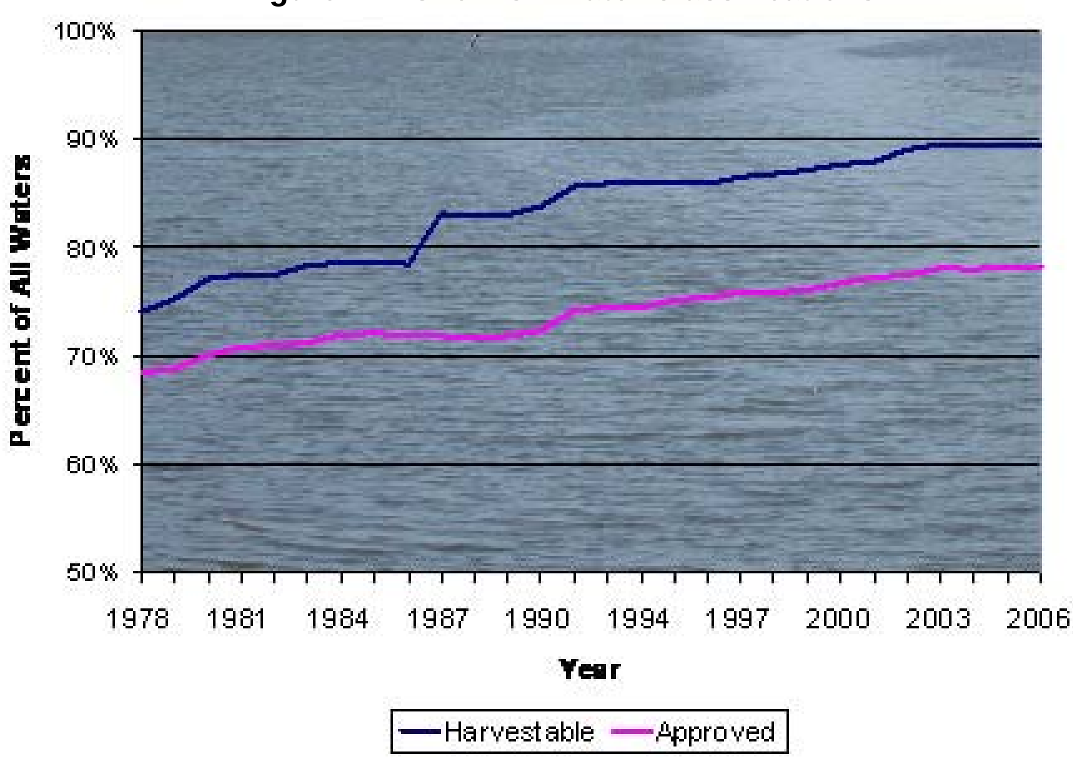
CSO discharges are located in the New York/New Jersey Harbor Estuary and the Delaware River Estuary around Camden. CSO permittees have invested over $300 million in infrastructure improvements to control the discharge of solids/floatable materials in CSO discharges and/or eliminate dry weather overflows. These efforts have resulted in a reduction in the frequency and duration of some CSO discharges and the elimination of 56 of 276 CSO discharge points through consolidation and/or sewer separation, thereby reducing the discharge of pathogens to the receiving waters. Solids/floatable control measures have been completed and are operating for 151 out of 183 CSO discharges in the New York/New Jersey Harbor Estuary Complex. As of September 2007, 70% of the planned solids and floatables control facilities were constructed and operational resulting in the capture and removal of about 600 tons of solids and floatables materials during calendar year 2006. Control measures required for the remaining CSO discharges are either under design or under construction. When all of the required solids/floatable control facilities are in operation, approximately 850 tons of solids/floatable material will have been captured or otherwise prevented from entering the waters of the State.

These waters in the New York-New Jersey Harbor Estuary are not currently designated for primary contact recreation and do not allow for unrestricted shellfish harvest due to high levels of pathogens. The Department is engaged in a comprehensive TMDL process to determine appropriate designated uses, water quality criteria to protect the designated uses, and actions needed to meet water quality goals. As part of this process, the Department will be evaluating whether these waters can be upgraded to support the primary contact recreational use and shellfish harvest.

Another measure of water quality improvement is the number of non-trout streams that have been documented as supporting trout production and trout maintenance. Between 1993 and 2004, the Department upgraded 70 streams from FW2-NT (freshwater non-trout) to FW2-TP (freshwater trout-production) and 27 streams from non-trout to FW2-TM (freshwater trout-maintenance). Between 2004 and 2006, six more non-trout streams were upgraded to trout production, and two more non-trout streams were upgraded to trout maintenance. These upgrades expand the number of streams available for highly desirable trout fishing in the State.

A third measure of water quality improvement is the percent of shellfish waters open for harvest. The shellfish industry represents a significant portion of New Jersey's coastal economy with an estimated dockside value of about $80,000,000 per year. In 1998, the Department established a target of 90% by 2005 for shellfish waters classified as safe to harvest. This includes shellfish waters classified as fully approved, seasonally approved and special restricted. The Department achieved this goal in 2003. Approximately 78% of the designated waters are fully approved for unrestricted shellfish harvest based on water quality and almost 90% are classified for harvesting with some restrictions (see Figure 7.2).

Figure 7.2: Shellfish Water Classifications



Note: Waters classified as "Approved" have no restrictions on shellfish harvesting by licensed harvesters. Waters classified as "Harvestable" are restricted to shellfish harvesting seasonally, either from November through April or January through April of each year, or by special permit." Shellfish harvested by special permit must be further purified prior to being sold, either by relay to shellfish waters classified as "Approved" or by processing in a depuration plant.

Chapter 8: Public Participation

Summary of the Public Participation Process for the 2008 Integrated List

The Integrated Report combines the reporting requirements of Sections 305(b) and 303(d) of the federal Clean Water Act. The Integrated List component of the Report, which categorizes the results of use assessments for all the State's assessment units into sublists (Sublists 1 through 5), satisfies the reporting requirements of Section 305(b) formerly addressed by the Statewide Water Quality Inventory Report. The 303(d) List component of the Report, which satisfies the reporting requirements of Section 303(d), includes the assessment units identified as not attaining one or more designated uses (Sublist 5), the pollutants causing non-attainment 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, the 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 categorizing assessment units into the five sublists of the Integrated 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 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 is afforded the opportunity to participate in three key phases of development of the Integrated List: 1) submission of data, 2) review of and comment on the proposed assessment methods; and 3) review of and comment on the proposed Integrated List and 303(d) List. These phases are summarized below.

Public Submission of Data

Public participation begins with a public request for data submissions. The Department provides several avenues for announcing its intent to seek water quality-related data and information from the general public, including publication of notices in the New Jersey Register, in Department-generated newsletters, and via electronic mailing to a host of interested entities. The public notice requesting data for the 2008 Integrated Water Quality Monitoring and Assessment Report was published in the February 20, 2007 New Jersey Register and concurrently on the Department's Web site (see http://www.state.nj.us/dep/wms/bwqsa/docs/08datasolicitation.pdf.) In addition to the New Jersey Register publication, the public notice soliciting data for the 2008 Integrated Report was also published in newspapers of general circulation and direct mailings were sent to interested individuals and organizations. The Department also directly contacted numerous groups and organizations known to have collected water quality data, including local, state, and federal agencies, members of the public, and academic institutions.

The deadlines for submitting data for use in the Integrated Report are specified in the public notice. The Department generally allows six months for the submission of data subsequent to the publication of the data solicitation notice. The reporting period (usually data collected within the preceding five years) is also identified in the public notice. The 2008 Integrated Report includes data collected between January 1, 2002 and December 31, 2006. Data collected through December 31, 2006 were accepted until July 15, 2007 for the development of the 2008 Integrated List. As such, the 2008 Integrated Report reports the status of New Jersey's waters through 2006. This is consistent with the neighboring states of Delaware and Pennsylvania, as well as the Delaware River Basin Commission. A "cut-off" date for data submission is necessary to allow the timely completion of a draft Integrated List that can be distributed for public review and comment before the Integrated Report is completed. Data collected after December 31, 2006 and data submitted after July 15, 2007 will be considered for subsequent Integrated Reports.

In determining which data are appropriate and readily available for assessment purposes, the Department considers quality assurance/quality control, monitoring design, age of data, accurate sampling location information, data documentation, and use of electronic data management. Data requirements are discussed in detail in Chapter 3 of the Methods Document (see Appendix F). The Department is working with data-generating organizations to organize their data, provide training in acceptable sampling techniques, and certify laboratories and field measurement protocols.

The Department endeavors to continuously interact with other data collecting organizations and facilitate the exchange of information. To that end, the New Jersey Water Monitoring Coordinating Council was established on October 24, 2003, which serves as a statewide body to promote and facilitate the coordination, collaboration, and communication of scientifically sound, ambient water quality and quantity information to support effective environmental management. The Council consists of representatives from various Divisions and Programs within Department, US Geological Survey, USEPA Region 2, the Delaware River Basin Commission, the Interstate Environmental Commission, the Pinelands and Meadowlands Commissions, various members of academia, county health departments, and a volunteer monitoring representative. The Council provides a forum for information and data exchange among its participants. Several Council member organizations provided data for the 2008 Integrated Report. More information regarding the Council is available at: http://www.state.nj.us/dep/wms//wmcchome.html.

Public Review of Draft Documents

Once the Department has completed its review of the data submitted by other entities and incorporates the results as appropriate, the Department provides an opportunity for public review of the Integrated Water Quality Monitoring and Assessment Methods Document and the Draft Integrated List. The Department publishes a notice in the New Jersey Register, on the Department Web site, and in newspapers of general circulation throughout the state, announcing the availability of these documents for public review and comment. Adjacent states, federal, and interstate agencies are also notified, as appropriate.

Methods Document

On July 2, 2007, the Department published a public notice (see 39 N.J.R. 2548) announcing availability for review of the draft 2008 Integrated Water Quality Monitoring and Assessment Methods Document. This document includes a description of the quality assurance requirements as well as the rationale for the placement of waterbodies in Sublists 1 through 5 of the Integrated List. A 30-day public comment period was provided. After review and consideration of comments received, the Department finalized the Methods Document (Appendix F).

Integrated List/303(d) List

The Department is required to propose the 303(d) List of Water Quality Limited Segments as an amendment to the Statewide Water Quality Management Plan, provide an opportunity for public comment, and adopt the amendment in accordance with N.J.A.C. 7:15-6.4. A public notice announcing the availability for review of the draft 2008 Integrated List was published in the New Jersey Register on August 18, 2008, in newspapers of general circulation throughout the State, and on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/2008_integrated_report.htm, followed by a 30-day public comment period. Adjacent state, federal, and interstate agencies were also notified. A public information session outlining the changes in the methodology used to develop the Integrated List is scheduled for September 11, 2008 and the public comment period closes on September 17, 2008. Responses to comments on the draft 2008 Integrated List will be posted on the Department's Web site once the final 2008 Integrated List is approved by USEPA Region 2. The Integrated List is located in Appendix A and the 303(d) List of Water Quality Limited Waters is in Appendix B.

Chapter 9: Next Steps-Preparing for 2010 and Beyond

The Department has continued to make significant improvements to New Jersey's water quality monitoring and assessment process since its integration in 2002. The 2008 Integrated Report describes improvements in monitoring and assessment methods made since the 2006 Integrated Report. Some of these improvements were identified as "next steps" in the 2006 Integrated Report, including toxics monitoring to verify impairment(s) from historic listings and amendments to the surface water quality criteria for pH to address the naturally-occurring acidic conditions in South Jersey waters adjacent to but not part of the boundaries established for the Pinelands National Reserve.

The Department recognizes that monitoring and assessment is an iterative process that will require continuous reevaluation and refinement to identify and fill data gaps, explore new and emerging issues, and improve efficiencies in applying existing methods, especially in light of the resource constraints imposed by the current state, national, and global economy. This section summarizes the information gaps and steps the Department is taking to bridge the data gaps and improve assessment methods. The Department may not be able to complete all the required tasks necessary to make these refinements for the 2010 Integrated Report; however, the Department will continue to identify progress made in each subsequent reporting cycle.

Prioritize Monitoring Efforts to Complete the Assessment of All Designated Uses

The Integrated List identifies the status of individual designated uses in each assessment unit. In the 2008 Integrated Report, the Department assessed all uses (except fish consumption) in 472 assessment units. A total of 134 of these fully assessed AUs attain all designated uses (except fish consumption). Additional monitoring is needed in 398 assessment units to assess all uses in all 970 assessment units statewide.

- **Increase Monitoring**: Consistent with the recommendations in the New Jersey Water Monitoring and Assessment Strategy (Appendix G), the Department will use the Integrated Report to focus additional monitoring in AUs where additional data will result in the assessment of all designated uses in those AUs. By targeting monitoring efforts to support the full assessment of all uses in partially assessed AUs, the Department hopes to increase the number of AUs assigned to Sublist 1 (i.e., in full attainment of all designated uses).

- **Lake Sanitary Data:** Unlike rivers and streams, lake primary contact assessments are limited to lakes with designated bathing areas. The Department intends to work with the DHSS to identify all licensed bathing beaches and ensure that the Department receives all appropriate data for these beaches.

- **Continuous Monitoring:** The Department has initiated a program to collect baseline temperature data statewide. Over the next two years, temperature data from an additional 20 stations a year will be collected in the southern part of the state. In addition, the Pequannock River Coalition has volunteered to collect data at additional sites in the northern sections of the state. The Department's Water Monitoring and Standards program intends to place additional telemetry buoys in the estuarine waters, which provide pH, dissolved oxygen, salinity, temperature, turbidity, and Chlorophyll *α* data.

- **Monitoring For Metals:** There are still a significant number of AUs for which there are no data to assess the presence of metals. This is partially the consequence of the high analytical cost of these constituents. The Department will explore methods for prioritizing metals monitoring in AUs with a high likelihood of metal contamination, using sediment quality and benthic macroinvertebrate data as screening tools, to better assess metals in subsequent reports.

Enhancements to the Assessment Methodology

The Methods Document (Appendix F) is a "living" document that undergoes a complete review and update as part of each reporting cycle. A draft of the Methods Document is provided to the public and USEPA for comment prior to developing the Integrated List. Below are some assessment methods/issues the Department plans to revisit for the next iteration of the Methods Document (for the 2010 Integrated List/Report).

- **Develop Nutrient Assessment Methodology to Evaluate Narrative Phosphorus Criterion for Freshwater Streams:** New Jersey's Surface Water Quality Standards (SWQS) contain numeric and narrative surface water quality criteria for total phosphorus (TP) and narrative nutrient policies that apply to freshwaters of the State. The narrative nutrient policies prohibit nutrient concentrations that cause objectionable algal densities, nuisance aquatic vegetation, or otherwise render waters unsuitable for designated uses. However, the SWQS do not include numeric translators and, in the past, the Department relied almost exclusively on the numeric phosphorus criteria for assessment as well as regulatory purposes, such as establishing effluent limitations and development of total maximum daily loads for waters assessed as impaired for phosphorus. The Department is currently developing a new assessment methodology for the identification of nutrient-impaired streams. The Department plans to use ecosystem response variables such dissolved oxygen and biological indicators (e.g., benthic macroinvertebrates and/or phytoplankton) and indices to evaluate use attainment and TP over-enrichment. This new nutrient assessment methodology will be used to determine if TP over-enrichment is the cause of impairment. For waterbodies found to be impaired due to phosphorus based upon the new assessment method, the Department may develop nutrient reductions based on watershed specific nutrient translators or implement the existing numeric criterion.

- **Develop a Benthic Indicator For Estuarine and Ocean Waters to Improve the Assessment of Aquatic Life Use:** USEPA's National Coastal Assessment (NCA) program is providing states with the first complete and consistent dataset on the condition of benthic communities in the nation's estuarine waters. Prior to the NCA, New Jersey based its measure of ecological health of its coastal waters solely on dissolved oxygen measurements. As a result of the availability of NCA and REMAP data, New Jersey included an ecological assessment of its benthic community in the 2006 Integrated Assessment for the Raritan Bay Estuary. The Department plans to expand this type of ecological assessment to the rest of its estuarine and ocean waters. The Department is working with USEPA and Rutgers University to develop a metric for the benthic community that accurately measures impairment of the aquatic life use for these waterbodies.

- **Stressor Identification:** Many AUs are listed as impaired based only on biological data. The Department needs to identify the pollutant that is causing the impairment or generate sufficient data to show that the impaired biological conditions are not due to a pollutant. Identifying the pollutant will enable the Department to develop a TMDL (or implement another appropriate control measure) to address the impairment. Demonstrating that the impairment is <u>not</u> due to a pollutant will allow the Department to delist impaired waters. The Department has initiated a program known as the Stressor Identification process (SI) to identify the full suite of stressors, on a site-specific basis, that have led to biological impairment. This effort is an outgrowth of a USEPA initiative that was subsequently modified by the Department to better reflect the Department's own assessment experience. The pilot project assessed four impaired biological sites, located in Drakes, Holland, and Beaver Brooks, all tributaries to the South Branch Raritan River. Field work for the pilot is complete and a report is being drafted. Upon completion of the project, a larger-scale effort will begin in coordination with stream restoration projects funded under the Department's 319(h) Nonpoint Source Pollution Control Grant Program.

- **Bayesian Statistics**: The Department's Division of Science and Research is exploring the use of Bayesian statistics to enhance the Department's ability to estimate water quality conditions in unmonitored waters. Initial results are promising and expectations are that these methodologies will help the Department identify waterbodies with a high likelihood of exceeding SWQS so monitoring can be targeted at confirming such conditions and implementing appropriate restoration strategies to ultimately achieve attainment of designated uses in all such waters and their corresponding assessment units.

- **GIS-based Assessments**: The Department will also be evaluating whether a GIS-based assessment tool can be developed for the assessment of small headwater AUs for which there is little or no data, in lieu of, or supplemental to, the assignment of valuable and scarce monitoring resources to such waters.

Revise Surface Water Quality Standards (SWQS)

The SWQS, at N.J.A.C. 7:9B, are used to evaluate use attainment for all waters of the State. However, the integrated assessment process raises some issues regarding specific use designations and the criteria established to protect and maintain the uses. The Department anticipates that some revisions to the SWQS will be necessary to resolve these issues for future Integrated Reports.

- **Classification Issues:** Many waters are classified as FW2-NT/SE1 (i.e., freshwater non-trout/saline estuary). To determine the appropriate uses of such waters, and the criteria needed to protect those uses, the level of salinity is considered. The Department needs to remove the SE1 classification from waters that are located above the head-of-tide, as these would not be considered saline waters, and remove the FW classification from waters with elevated salinity.

- **Establish pH criteria for the Coastal Plain:** As discussed in the 2008 Methods Document (Appendix F, section 1.2), the Department developed a biological assessment method called the Pinelands Macroinvertebrate Index, or PMI. This new method is based upon benthic macroinvertebrate communities specific to Pinelands waters, which are designated PL based upon the political boundaries used in delineating the "Pinelands Area" of the State, to better assess use attainment of these low pH waters. The true extent of the low pH, low buffer capacity waters historically characteristic of the New Jersey Coastal Plain "Pinelands" lies well beyond this political boundary and is closely aligned with the underlying geology of the region. The new benthic indicator will apply to PL waters and FW2 waters within five kilometers of the Pinelands Area. Research indicates that the low pH values influenced by soil types are prevalent below the Route 1 corridor. The Department plans to establish a new pH range for waters in the Coastal Plain outside of the Pinelands Area.

- **Modernizing Standards To Reflect New Monitoring Techniques:** Dissolved oxygen (DO) and temperature are critical parameters in the assessment of aquatic life use attainment, especially in assessing waters classified for Trout Production and Trout Maintenance. Many SWQS were developed for use in setting NJPDES permit limits, for which a single exceedance may be appropriate for assessing compliance based on quarterly sampling. However, now that continuous monitoring can be implemented on a routine basis using in-place recording devises, a different threshold seems more appropriate for assessment purposes. Similarly, extensive use of in-place recording devises for temperature provides the Department with more extensive datasets, and a better picture of overall stream conditions, than one sample taken on a given day, usually at peak temperatures in the afternoon. Revisions to the SWQS and assessment methods are being considered by the Department to address these concerns.

- **Incorporate the Integrated Water Quality Monitoring and Assessment Methods Document (Methods Document) into the SWQS:** The SWQS establish the water quality criteria necessary to attain the designated uses of all waters of the State. The Department is required to assess all waters of the State, pursuant to Section 305(b) of the federal Clean Water Act, for conformance with the SWQS and attainment of the designated uses established therein. The Department is also required, under Section 303(d) and the Water Quality Management Planning Rules at N.J.A.C. 7:15-6, to publish a List of Water Quality Limited Waters (i.e., waters that do not comply with the applicable SWQS and/or do not attain the applicable designated uses). The data requirements to interpret the SWQS criteria and determine if designated uses are attained (or if waters are identified as water quality limited) are documented in the Methods Document. Because of its regulatory implications, as explained above, the Department plans to incorporate the Methods Document in the SWQS by reference.

Data Exchange and Management

The Department recognizes the challenges associated with collecting and managing water quality data. It is especially difficult for volunteer monitoring groups, who coordinate data collection from a host of individuals with varied technical expertise. Currently, the New Jersey Watershed Watch Network is completing development of a user-friendly data management system that will serve as an online electronic submission tool for local volunteer water monitors. This online data management system will help alleviate the burden of data management and allow for volunteer-collected data to be submitted directly to the Department. This new system will allow the data to be effectively managed, analyzed, and reported for use by the Department, other interested organizations, the general public, and the monitors themselves. The Department is also developing a larger scale data exchange tool to integrate all available, high quality data (both Department and non-Department data) into the Department's ambient water quality database system through development of a common data exchange element. Both these projects will make it easier for the Department to analyze all the "readily available data" generated throughout the State.

The assessment units were placed on one of five sublists according to the following: (See Section 7 of the Integrated List Methods Document for more detail on the Sublists). N/A (not applicable) is used when the designated use does not apply to a particular assessment unit.

Sublist 1: A designated use is placed on this list when there is sufficient data to assess the applicable designated uses for the waterbody (with the exception of fish consumption) and the assessment indicates full attainment for the designated uses.

Sublist 2: Waterbodies are placed on this sublist when an assessment for an individual designated use is complete and results for that assessment indicates full attainment but other designated uses are unassessed, assessed as non attain or have an approved TMDL. When all designated uses are assessed as full attain, (with the exception of fish consumption) these waterbodies will be moved to Sublist 1.

Sublist 3: Waterbodies are placed on this sublist when the designated use assessment indicated insufficient or no data to assess the designated use.

Sublist 4: The waterbody is impaired or threatened for one or more designated uses. There are three subcategories:

Sublist 4A. Waterbodies are placed on this sublist when the designated use is non attain due to pollutants and a TMDL has been adopted in New Jersey Register and approved by the USEPA
Sublist 4B. Waterbodies are placed on this sublist when the designated use is non attain due to pollutants and other enforceable pollution control requirements are reasonably expected to result in the conformance with the applicable water quality standard(s) in the near future.
Sublist 4C. Waterbodies are placed on this sublist when the designated use is non attain and the impairment is not caused by a pollutant.

Sublist 5: Designated use assessment is complete and results for the assessment indicate non-attain.

(The individual pollutants causing the non attainment of the designated uses will be identified on the "303(d) List of Impaired Waterbodies by Parameter with Ranking". The Pollutant will be listed if known or "cause unknown" or "toxic unknown" will be used when the pollutant is not known.)

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
2	02020007000010-01	Rutgers Creek Tribs	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
2	02020007010010-01	Wallkill River / Lake Mohawk (above Sparta Sta)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007010020-01	Wallkill River (Ogdensburg to Sparta Station)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007010030-01	Franklin Pond Creek	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
2	02020007010040-01	Wallkill River (Hamburg SW Bdy to Ogdensburg)	Sublist 5	Sublist 5	Sublist 4A	Sublist 4A	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007010050-01	Hardistonville Tribs	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
2	02020007010060-01	Beaver Run	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
2	02020007010070-01	Wallkill River (Martins Rd to Hamburg SW Bdy)	Sublist 5	N/A	Sublist 4A	Sublist 4A	Sublist 5	Sublist 2	N/A	Sublist 3
2	02020007020010-01	Papakating Creek (above Frankford Plains)	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007020020-01	Wykertown Tribs (Papakating Creek)	Sublist 3	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
2	02020007020030-01	Papakating Creek (Pellettown-Frankford Plns)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007020040-01	Papakating Creek WB(abv 74d39m30s side rd)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007020050-01	Papakating Creek WB(blw 74d39m30s side rd)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007020060-01	Clove Brook (Papakating Ck)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
2	02020007020070-01	Papakating Creek (below Pellettown)	Sublist 5	N/A	Sublist 4A	Sublist 4A	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007030010-01	Wallkill River (41d13m30s to Martins Road)	Sublist 5	N/A	Sublist 4A	Sublist 4A	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007030020-01	Quarryville Brook	Sublist 3	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
2	02020007030030-01	Wallkill River (Owens gage to 41d13m30s)	Sublist 2	N/A	Sublist 4A	Sublist 4A	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007030040-01	Wallkill River (stateline to Owens gage)	Sublist 2	Sublist 2	Sublist 4A	Sublist 4A	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007040010-01	Black Creek (above/incl G.Gorge Resort trib)	Sublist 4A	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007040020-01	Black Creek (below G. Gorge Resort trib)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007040030-01	Pochuck Creek / Glenwood Lake & northern Trib	Sublist 3	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
2	02020007040040-01	Highland Lake / Wawayanda Lake	Sublist 2	Sublist 3	Sublist 3	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 5
2	02020007040050-01	Wawayanda Creek & Tribs	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
2	02020007040060-01	Long House Creek / Upper Greenwood Lake	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
5	02030101170010-01	Hudson River	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
5	02030101170020-01	Sparkill Brook	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103010010-01	Passaic River Upr (above Osborn Mills)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103010020-01	Primrose Brook	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 3
6	02030103010030-01	Great Brook (above Green Village Rd)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103010040-01	Loantaka Brook	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 5	Sublist 3	N/A	Sublist 3
6	02030103010050-01	Great Brook (below Green Village Rd)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103010060-01	Black Brook (Great Swamp NWR)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
6	02030103010070-01	Passaic River Upr (Dead R to Osborn Mills)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103010080-01	Dead River (above Harrisons Brook)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103010090-01	Harrisons Brook	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103010100-01	Dead River (below Harrisons Brook)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103010110-01	Passaic River Upr (Plainfield Rd to Dead R)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
6	02030103010120-01	Passaic River Upr (Snyder to Plainfield Rd)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
6	02030103010130-01	Passaic River Upr (40d 45m to Snyder Ave)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
6	02030103010140-01	Canoe Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 3
6	02030103010150-01	Passaic River Upr (Columbia Rd to 40d 45m)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
6	02030103010160-01	Passaic River Upr (Hanover RR to ColumbiaRd)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 5	N/A	Sublist 3
6	02030103010170-01	Passaic River Upr (Rockaway to Hanover RR)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 5	Sublist 5	N/A	Sublist 5
6	02030103010180-01	Passaic River Upr (Pine Bk br to Rockaway)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
6	02030103020010-01	Whippany River (above road at 74d 33m)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103020020-01	Whippany River (Wash. Valley Rd to 74d 33m)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103020030-01	Greystone / Watnong Mtn Tribs	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103020040-01	Whippany River (Lk Pocahontas to Wash Val Rd	Sublist 2	Sublist 3	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
6	02030103020050-01	Whippany River (Malapardis to Lk Pocahontas)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103020060-01	Malapardis Brook	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
6	02030103020070-01	Black Brook (Hanover)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103020080-01	Troy Brook (above Reynolds Ave)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
6	02030103020090-01	Troy Brook (below Reynolds Ave)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103020100-01	Whippany River (Rockaway R to Malapardis Bk)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103030010-01	Russia Brook (above Milton)	Sublist 3	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103030020-01	Russia Brook (below Milton)	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 3
6	02030103030030-01	Rockaway River (above Longwood Lake outlet)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
6	02030103030040-01	Rockaway River (Stephens Bk to Longwood Lk)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
6	02030103030050-01	Green Pond Brook (above Burnt Meadow Bk)	Sublist 3	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103030060-01	Green Pond Brook (below Burnt Meadow Bk)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103030070-01	Rockaway River (74d 33m 30s to Stephens Bk)	Sublist 2	Sublist 3	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
6	02030103030080-01	Mill Brook (Morris Co)	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103030090-01	Rockaway River (BM 534 brdg to 74d 33m 30s)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
6	02030103030100-01	Hibernia Brook	Sublist 3	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
6	02030103030110-01	Beaver Brook (Morris County)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
6	02030103030120-01	Den Brook	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 3
6	02030103030130-01	Stony Brook (Boonton)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103030140-01	Rockaway River (Stony Brook to BM 534 brdg)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
6	02030103030150-01	Rockaway River (Boonton dam to Stony Brook)	Sublist 2	Sublist 3	Sublist 2	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
6	02030103030160-01	Montville Tribs	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
6	02030103030170-01	Rockaway River (Passaic R to Boonton dam)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
6	02030103040010-01	Passaic River Upr (Pompton R to Pine Bk)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
3	02030103050010-01	Pequannock River (above Stockholm/Vernon Rd	Sublist 5	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
3	02030103050020-01	Pacock Brook	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
3	02030103050030-01	Pequannock River (above Oak Ridge Res outlet)	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
3	02030103050040-01	Clinton Reservior / Mossmans Brook	Sublist 2	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
3	02030103050050-01	Pequannock River (Charlotteburg to OakRidge)	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
3	02030103050060-01	Pequannock River (Macopin gage to Charl'brg)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
3	02030103050070-01	Stone House Brook	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
3	02030103050080-01	Pequannock River (below Macopin gage)	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
3	02030103070010-01	Belcher Creek (above Pinecliff Lake)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
3	02030103070020-01	Belcher Creek (Pinecliff Lake & below)	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
3	02030103070030-01	Wanaque River / Greenwood Lake (above Monk	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
3	02030103070040-01	West Brook / Burnt Meadow Brook	Sublist 2	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
3	02030103070050-01	Wanaque Reservior (below Monks gage)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
3	02030103070060-01	Meadow Brook / High Mountain Brook	Sublist 5	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
3	02030103070070-01	Wanaque River / Posts Bk (below reservior)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
3	02030103100010-01	Ramapo River (above 74d 11m 00s)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
3	02030103100020-01	Masonicus Brook	Sublist 4A	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
3	02030103100030-01	Ramapo River (above Fyke Bk to 74d 11m 00s)	Sublist 4A	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
3	02030103100040-01	Ramapo River (Bear Swamp Bk thru Fyke Bk)	Sublist 4A	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
3	02030103100050-01	Ramapo River (Crystal Lk br to BearSwamp Bk)	Sublist 5	Sublist 4A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
3	02030103100060-01	Crystal Lake / Pond Brook	Sublist 4A	Sublist 3	Sublist 4A	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 5
3	02030103100070-01	Ramapo River (below Crystal Lake bridge)	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
3	02030103110010-01	Lincoln Park Tribs (Pompton River)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
3	02030103110020-01	Pompton River	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
4	02030103120010-01	Peckman River (above CG Res trib)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
4	02030103120020-01	Peckman River (below CG Res trib)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 2	N/A	Sublist 5
4	02030103120030-01	Preakness Brook / Naachtpunkt Brook	Sublist 5	Sublist 5	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
4	02030103120040-01	Molly Ann Brook	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
4	02030103120050-01	Goffle Brook	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
4	02030103120060-01	Deepavaal Brook	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
4	02030103120070-01	Passaic River Lwr (Fair Lawn Ave to Goffle)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
4	02030103120080-01	Passaic River Lwr (Dundee Dam to F.L. Ave)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
4	02030103120090-01	Passaic River Lwr (Saddle R to Dundee Dam)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
4	02030103120100-01	Passaic River Lwr (Goffle Bk to Pompton R)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
4	02030103140010-01	Hohokus Brook (above Godwin Ave)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
4	02030103140020-01	Hohokus Brook (Pennington Ave to Godwin Ave)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
4	02030103140030-01	Hohokus Brook (below Pennington Ave)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
4	02030103140040-01	Saddle River (above Rt 17)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
4	02030103140050-01	Saddle River (Rt 4 to Rt 17)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
4	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 5	N/A	Sublist 3
4	02030103140070-01	Saddle River (below Lodi gage)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 5	N/A	Sublist 5
4	02030103150010-01	Third River	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
4	02030103150020-01	Second River	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
4	02030103150030-01	Passaic River Lwr (Second R to Saddle R)	Sublist 5	N/A	Sublist 5	N/A	Sublist 3	Sublist 2	N/A	Sublist 5
4	02030103150040-01	Passaic River Lwr (4th St br to Second R)	Sublist 5	N/A	Sublist 2	N/A	Sublist 3	Sublist 2	N/A	Sublist 5
4	02030103150050-01	Passaic River Lwr (Nwk Bay to 4th St brdg)	Sublist 5	N/A	Sublist 2	N/A	Sublist 3	Sublist 2	N/A	Sublist 5
5	02030103170010-01	Pascack Brook (above Westwood gage)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
5	02030103170020-01	Pascack Brook (below Westwood gage)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
5	02030103170030-01	Hackensack River (above Old Tappan gage)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
5	02030103170040-01	Tenakill Brook	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
5	02030103170050-01	Dwars Kill	Sublist 2	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
5	02030103170060-01	Hackensack River (Oradell to Old Tappan gage)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5

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5	02030103180010-01	Coles Brook / Van Saun Mill Brook	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
5	02030103180020-01	Hirshfeld Brook	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
5	02030103180030-01	Hackensack River (Ft Lee Rd to Oradell gage)	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	N/A	Sublist 5
5	02030103180040-01	Overpeck Creek	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 5
5	02030103180050-01	Hackensack River (Bellmans Ck to Ft Lee Rd)	Sublist 5	N/A	Sublist 2	N/A	Sublist 3	Sublist 2	N/A	Sublist 5
5	02030103180060-01	Berrys Creek (above Paterson Ave)	Sublist 5	N/A	Sublist 3	N/A	Sublist 3	Sublist 3	N/A	Sublist 5
5	02030103180070-01	Berrys Creek (below Paterson Ave)	Sublist 5	N/A	Sublist 3	N/A	Sublist 3	Sublist 3	N/A	Sublist 5
5	02030103180080-01	Hackensack River (Rt 3 to Bellmans Ck)	Sublist 5	N/A	Sublist 3	N/A	Sublist 3	Sublist 2	N/A	Sublist 5
5	02030103180090-01	Hackensack River (Amtrak bridge to Rt 3)	Sublist 5	N/A	Sublist 2	N/A	Sublist 3	Sublist 2	N/A	Sublist 5
5	02030103180100-01	Hackensack River (below Amtrak bridge)	Sublist 5	N/A	Sublist 3	N/A	Sublist 3	Sublist 2	N/A	Sublist 5
7	02030104010010-01	Newark Airport Peripheral Ditch	Sublist 5	N/A	Sublist 3	N/A	Sublist 3	Sublist 3	N/A	Sublist 5
7	02030104010020-01	Kill Van Kull West	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
7	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
7	02030104010030-01	Kill Van Kull East	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
7	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
7	02030104020010-01	Elizabeth River (above I-78)	Sublist 3	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
7	02030104020020-01	Elizabeth River (Elizabeth CORP BDY to I-78)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
7	02030104020030-01	Arthur Kill North	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
7	02030104020030-02	Elizabeth River (below Elizabeth CORP BDY)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 5
7	02030104030010-01	Arthur Kill South	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
7	02030104030010-02	Morses Creek / Piles Creek	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 5
7	02030104050010-01	Rahway River WB	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
7	02030104050020-01	Rahway River EB	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
7	02030104050030-01	Baltusrol trib (above Springfield Sta)	Sublist 3	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
7	02030104050040-01	Rahway River (Kenilworth Blvd to EB / WB)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 3
7	02030104050050-01	Nomahegan Brook	Sublist 3	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
7	02030104050060-01	Rahway River (Robinsons Br to Kenilworth Blvd)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 5
7	02030104050070-01	Robinsons Branch Rahway River (above Lake A	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
7	02030104050080-01	Robinsons Branch Rahway River (below Lake A	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
7	02030104050090-01	Rahway River SB	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 5
7	02030104050100-01	Rahway River (below Robinsons Branch)	Sublist 2	N/A	Sublist 2	N/A	Sublist 3	Sublist 3	N/A	Sublist 5
7	02030104050110-01	Woodbridge Creek	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
7	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	N/A	Sublist 5
12	02030104060010-01	Cheesequake Creek / Whale Creek	Sublist 5	N/A	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 2	Sublist 5
12	02030104060020-01	Matawan Creek (above Ravine Drive)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 2	N/A	Sublist 3
12	02030104060030-01	Matawan Creek (below Ravine Drive)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 5
12	02030104060040-01	Chingarora Creek to Thorns Creek	Sublist 5	N/A	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 2	Sublist 5

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12	02030104060050-01	Waackaack Creek	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 4A	Sublist 5
12	02030104060060-01	Pews Creek to Shrewsbury River	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 5
12	02030104070010-01	Hop Brook	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
12	02030104070020-01	Willow Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104070030-01	Big Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104070040-01	Yellow Brook (above Bucks Mill)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104070050-01	Mine Brook (Monmouth Co)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104070060-01	Yellow Brook (below Bucks Mill)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
12	02030104070070-01	Swimming River Reservior / Slope Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104070080-01	Pine Brook / Hockhockson Brook	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104070090-01	Nut Swamp Brook	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
12	02030104070100-01	Poricy Brook / Swimming River (below Swimmin	Sublist 5	N/A	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 4A	Sublist 5
12	02030104070110-01	Navesink River (below Rt 35) / Lower Shrewsbu	Sublist 5	N/A	Sublist 4A	N/A	Sublist 2	Sublist 2	Sublist 4A	Sublist 5
12	02030104080010-01	Little Silver Creek / Town Neck Creek	Sublist 2	N/A	Sublist 4A	N/A	Sublist 3	Sublist 3	Sublist 4A	Sublist 5
12	02030104080020-01	Parkers Creek / Oceanport Creek	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	Sublist 4A	Sublist 5
12	02030104080030-01	Branchport Creek	Sublist 5	N/A	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 4A	Sublist 5
12	02030104080040-01	Shrewsbury River (above Navesink River)	Sublist 5	N/A	Sublist 4A	N/A	N/A	N/A	Sublist 4A	Sublist 5
12	02030104090010-01	Whale Pond Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104090020-01	Poplar Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104090030-01	Deal Lake	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 5	N/A	Sublist 3
12	02030104090040-01	Shark River (above Remsen Mill gage)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
12	02030104090050-01	Jumping Brook (Ocean Co)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104090060-01	Shark River (below Remsen Mill gage)	Sublist 5	N/A	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 4A	Sublist 5
12	02030104090070-01	Wreck Pond Brook (above Rt 35)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104090080-01	Wreck Pond Brook (below Rt 35)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
12	02030104100010-01	Manasquan River (above 74d17m50s road)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
12	02030104100020-01	Manasquan River (Rt 9 to 74d17m50s road)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104100030-01	Manasquan River (West Farms Rd to Rt 9)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104100040-01	Marsh Bog Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104100050-01	Manasquan River (gage to West Farms Rd)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
12	02030104100060-01	Mingamahone Brook (above Asbury Rd)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104100070-01	Mingamahone Brook (below Asbury Rd)	Sublist 2	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
12	02030104100080-01	Manasquan River (74d07m30s to Squankum gag	Sublist 4A	Sublist 3	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
12	02030104100090-01	Manasquan River (Rt 70 br to 74d07m30s)	Sublist 5	Sublist 5	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 3
12	02030104100100-01	Manasquan River (below Rt 70 bridge)	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 4A	Sublist 3
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 5	Sublist 5
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 5	Sublist 5

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
12	02030104920010-01	Atlantic Ocean (Sandy H to Navesink R) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	N/A	Sublist 5
12	02030104920010-02	Atlantic Ocean (Sandy H to Navesink R) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	N/A	Sublist 5
12	02030104920020-01	Atlantic Ocean (Navesink R to Whale Pond) insh	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
21	02030104920020-02	Atlantic Ocean (Navesink R to Whale Pond) offsl	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
12	02030104930010-01	Atlantic Ocean (Whale Pond to Shark R) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
12	02030104930010-02	Atlantic Ocean (Whale Pond to Shark R) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
12	02030104930020-01	Atlantic Ocean (Shark R to Manasquan) inshore	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 2	Sublist 5
21	02030104930020-02	Atlantic Ocean (Shark R to Manasquan) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
8	02030105010010-01	Drakes Brook (above Eyland Ave)	Sublist 2	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
8	02030105010020-01	Drakes Brook (below Eyland Ave)	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
8	02030105010030-01	Raritan River SB (above Rt 46)	Sublist 2	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
8	02030105010040-01	Raritan River SB (74d 44m 15s to Rt 46)	Sublist 2	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
8	02030105010050-01	Raritan River SB (LongValley br to 74d44m15s)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105010060-01	Raritan River SB (Califon br to Long Valley)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105010070-01	Raritan River SB (StoneMill gage to Califon)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105010080-01	Raritan River SB (Spruce Run-StoneMill gage)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105020010-01	Spruce Run (above Glen Gardner)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105020020-01	Spruce Run (Reservior to Glen Gardner)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105020030-01	Mulhockaway Creek	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105020040-01	Spruce Run Reservior / Willoughby Brook	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
8	02030105020050-01	Beaver Brook (Clinton)	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105020060-01	Cakepoulin Creek	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105020070-01	Raritan River SB (River Rd to Spruce Run)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105020080-01	Raritan River SB (Prescott Bk to River Rd)	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105020090-01	Prescott Brook / Round Valley Reservior	Sublist 4A	Sublist 4A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 5
8	02030105020100-01	Raritan River SB (Three Bridges-Prescott Bk)	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105030010-01	First Neshanic River	Sublist 5	Sublist 5	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
8	02030105030020-01	Second Neshanic River	Sublist 2	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
8	02030105030030-01	Headquarters Trib (Third Neshanic River)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105030040-01	Third Neshanic River	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105030050-01	Back Brook	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
8	02030105030060-01	Neshanic River (below FNR / SNR confl)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
8	02030105040010-01	Raritan River SB (Pleasant Run-Three Bridges)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105040020-01	Pleasant Run	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105040030-01	Holland Brook	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105040040-01	Raritan River SB (NB to Pleasant Run)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105050010-01	Lamington River (above Rt 10)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3

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8	02030105050020-01	Lamington River (Hillside Rd to Rt 10)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105050030-01	Lamington River (Furnace Rd to Hillside Rd)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105050040-01	Lamington River (Pottersville gage-Furnace Rd)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105050050-01	Pottersville Trib (Lamington River)	Sublist 2	Sublist 2	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
8	02030105050060-01	Cold Brook	Sublist 2	Sublist 2	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
8	02030105050070-01	Lamington River (Halls Br Rd-Pottersville gage)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105050080-01	Rockaway Creek (above McCrea Mills)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105050090-01	Rockaway Creek (RockawaySB to McCrea Mills)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105050100-01	Rockaway Creek SB	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105050110-01	Lamington River (below Halls Bridge Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060010-01	Raritan River NB (above/incl India Bk)	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060020-01	Burnett Brook (above Old Mill Rd)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060030-01	Raritan River NB (incl McVickers to India Bk)	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060040-01	Raritan River NB (Peapack Bk to McVickers Bk)	Sublist 2	Sublist 3	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060050-01	Peapack Brook (above/incl Gladstone Bk)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060060-01	Peapack Brook (below Gladstone Brook)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060070-01	Raritan River NB (incl Mine Bk to Peapack Bk)	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060080-01	Middle Brook (NB Raritan River)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105060090-01	Raritan River NB (Lamington R to Mine Bk)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105070010-01	Raritan River NB (Rt 28 to Lamington R)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105070020-01	Chambers Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
8	02030105070030-01	Raritan River NB (below Rt 28)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105080010-01	Peters Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105080020-01	Raritan River Lwr (Rt 206 to NB / SB)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105080030-01	Raritan River Lwr (Millstone to Rt 206)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105090010-01	Stony Brook (above 74d 49m 15s)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105090020-01	Stony Brook (74d 48m 10s to 74d 49m 15s)	Sublist 2	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105090030-01	Stony Brook (Baldwins Ck to 74d 48m 10s)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105090040-01	Stony Brook (74d46m dam to/incl Baldwins Ck)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105090050-01	Stony Brook (Province Line Rd to 74d46m dam)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105090060-01	Stony Brook (Rt 206 to Province Line Rd)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105090070-01	Stony Brook (Harrison St to Rt 206)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105090080-01	Duck Pond Run	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105100010-01	Millstone River (above Rt 33)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
10	02030105100020-01	Millstone River (Applegarth road to Rt 33)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
10	02030105100030-01	Millstone River (Rocky Bk to Applegarth road)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105100040-01	Rocky Brook (above Monmouth Co line)	Sublist 2	N/A	Sublist 2	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3

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10	02030105100050-01	Rocky Brook (below Monmouth Co line)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 3	Sublist 2	N/A	Sublist 3
10	02030105100060-01	Millstone River (Cranbury Bk to Rocky Bk)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105100070-01	Cranbury Brook (above NJ Turnpike)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105100080-01	Cedar Brook (Cranbury Brook)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105100090-01	Cranbury Brook (below NJ Turnpike)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105100100-01	Shallow Brook (Devils Brook)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105100110-01	Devils Brook	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105100120-01	Bear Brook (above Trenton Road)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105100130-01	Bear Brook (below Trenton Road)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
10	02030105100140-01	Millstone River (Rt 1 to Cranbury Bk)	Sublist 3	N/A	Sublist 3	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110010-01	Heathcote Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105110020-01	Millstone River (HeathcoteBk to Harrison St)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
10	02030105110030-01	Millstone River (Beden Bk to Heathcote Bk)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110040-01	Beden Brook (above Province Line Rd)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110050-01	Beden Brook (below Province Line Rd)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105110060-01	Rock Brook (above Camp Meeting Ave)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105110070-01	Rock Brook (below Camp Meeting Ave)	Sublist 2	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110080-01	Pike Run (above Cruser Brook)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110090-01	Cruser Brook / Roaring Brook	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110100-01	Pike Run (below Cruser Brook)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105110110-01	Millstone River (Blackwells Mills to Beden Bk)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105110120-01	Sixmile Run (above Middlebush Rd)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105110130-01	Sixmile Run (below Middlebush Rd)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110140-01	Millstone River (AmwellRd to BlackwellsMills)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
10	02030105110150-01	Royce Brook (above Branch Royce Brook)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110160-01	Royce Brook (below/incl Branch Royce Bk)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
10	02030105110170-01	Millstone River (below Amwell Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105120010-01	Green Brook (above/incl Blue Brook)	Sublist 2	Sublist 3	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105120020-01	Green Brook (N Plainfield gage to Blue Bk)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105120030-01	Stony Brook (North Plainfield)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 3	N/A	Sublist 3
9	02030105120040-01	Green Brook (Bound Bk to N Plainfield gage)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105120050-01	Middle Brook EB	Sublist 5	Sublist 5	Sublist 3	Sublist 5	Sublist 5	Sublist 3	N/A	Sublist 3
9	02030105120060-01	Middle Brook WB	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105120070-01	Cuckels Brook	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105120080-01	South Fork of Bound Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
9	02030105120090-01	Spring Lake Fork of Bound Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
9	02030105120100-01	Bound Brook (below fork at 74d 25m 15s)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
9	02030105120110-01	Ambrose Brook (above/incl Lake Nelson)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105120120-01	Ambrose Brook (below Lake Nelson)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105120130-01	Green Brook (below Bound Brook)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 5
9	02030105120140-01	Raritan River Lwr (I-287 Piscatway-Millstone)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 5
9	02030105120150-01	Mile Run	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105120160-01	Raritan River Lwr (MileRun to I-287 Pisctwy)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 5
9	02030105120170-01	Raritan River Lwr (Lawrence Bk to Mile Run)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
9	02030105130010-01	Great Ditch / Pigeon Swamp	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105130020-01	Lawrence Brook (above Deans Pond dam)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105130030-01	Oakeys Brook	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105130040-01	Ireland Brook	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105130050-01	Lawrence Brook (Church Lane to Deans Pond)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 3	Sublist 2	N/A	Sublist 3
9	02030105130060-01	Lawrence Brook (Milltown to Church Lane)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105130070-01	Lawrence Brook (below Milltown/Herberts br)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
9	02030105140010-01	Manalapan Brook (above 40d 16m 15s)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105140020-01	Manalapan Brook (incl Lk Manlpn to 40d16m15s	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105140030-01	Manalapan Brook (below Lake Manalapan)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
9	02030105150010-01	Weamaconk Creek	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105150020-01	McGellairds Brook (above Taylors Mills)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105150030-01	McGellairds Brook (below Taylors Mills)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105150040-01	Matchaponix Brook (above/incl Pine Bk)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105150050-01	Barclay Brook	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105150060-01	Matchaponix Brook (below Pine Brook)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105160010-01	Deep Run (above Monmouth Co line)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105160020-01	Deep Run (Rt 9 to Monmouth Co line)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105160030-01	Duhernal Lake / Iresick Brook	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105160040-01	Deep Run (below Rt 9)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
9	02030105160050-01	Tennent Brook (above 74d 19m 05s)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105160060-01	Tennent Brook (below 74d 19m 05s)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105160070-01	South River (below Duhernal Lake)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
9	02030105160080-01	Mill Brook / Martins Creek	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
9	02030105160090-01	Red Root Creek / Crows Mill Creek	Sublist 2	N/A	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 2	Sublist 5
9	02030105160100-01	Raritan River Lwr (below Lawrence Bk)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02030902940020-01	Atlantic Ocean (Corson to Townsends Inl) inshor	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02030902940020-02	Atlantic Ocean (Corson to Townsends Inl) offsho	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02030902940030-01	Atlantic Ocean (Townsends to Hereford In) insho	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02030902940030-02	Atlantic Ocean (Townsends to Hereford In) offsh	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5

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1	02040104090010-01	Mashipacong Island UDRV Tribs	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040104090020-01	Clove Brook (Delaware R)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
1	02040104090030-01	Shimers Brook	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040104110010-01	Delaware River Tribs (Dingmans Ferry to 206 bri	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040104110020-01	Delaware River Tribs (Flat Bk to Dingmans Ferry	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040104130010-01	Little Flat Brook (Beerskill and above)	Sublist 2	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
1	02040104130020-01	Little Flat Brook (Layton to Beerskill)	Sublist 2	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040104130030-01	Little Flat Brook (Confluence to Layton)	Sublist 2	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040104140010-01	Big Flat Brook (above Forked Brook)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 5
1	02040104140020-01	Forked Brook / Parker Brook	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 3
1	02040104140030-01	Big Flat Brook (Kittle Rd to Forked Bk)	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 3
1	02040104140040-01	Big Flat Brook (Confluence to Kittle Rd)	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 3
1	02040104150010-01	Flat Brook (Tillman Brook to Confluence)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040104150020-01	Flat Brook (below Tillman Brook)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040104240010-01	Van Campens Brook	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040104240020-01	Dunnfield Creek (incl UDRV)	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 3
1	02040105030010-01	Swartswood trib (41-06-06 thru Lk Owassa)	Sublist 4A	Sublist 5	Sublist 4A	Sublist 3	Sublist 3	Sublist 2	N/A	Sublist 3
1	02040105030020-01	Swartswood Lake and Tribs	Sublist 4A	Sublist 5	Sublist 4A	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 5
1	02040105030030-01	Trout Brook	Sublist 2	Sublist 2	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
1	02040105040010-01	Culvers Creek	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105040020-01	Dry Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105040030-01	Lake Kemah Tribs	Sublist 3	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105040040-01	Lafayette Swamp Tribs	Sublist 5	Sublist 5	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105040050-01	Sparta Junction Tribs	Sublist 5	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105040060-01	Paulins Kill (above Rt 15)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105040070-01	Paulins Kill (Dry Brook to Rt 15)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105040080-01	Paulins Kill (PK Lk outlet to Dry Brook)	Sublist 2	Sublist 3	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105040090-01	Paulins Kill (Stillwater Vil to PK Lake)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105050010-01	Paulins Kill (Blairstown to Stillwater)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105050020-01	Blair Creek	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 3
1	02040105050030-01	Jacksonburg Creek	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105050040-01	Yards Creek	Sublist 5	Sublist 5	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105050050-01	Paulins Kill (below Blairstown gage)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105060010-01	Stony Brook (incl UDRV)	Sublist 2	Sublist 2	Sublist 4A	Sublist 3	Sublist 3	Sublist 2	N/A	Sublist 3
1	02040105060020-01	Delawanna Creek (incl UDRV)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105070010-01	Lake Lenape trib	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105070020-01	New Wawayanda Lake / Andover Pond Trib	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3

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1	02040105070030-01	Pequest River (above Brighton)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105070040-01	Pequest River (Trout Brook to Brighton)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105070050-01	Trout Brook / Lake Tranquility	Sublist 5	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105070060-01	Pequest River (below Bear Swamp to Trout Bk)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105080010-01	Bear Brook (Sussex/Warren Co)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105080020-01	Bear Creek	Sublist 5	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105090010-01	Pequest River (Drag Strip--below Bear Swamp)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105090020-01	Pequest River (Cemetary Road to Drag Strip)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105090030-01	Pequest River (Furnace Bk to Cemetary Road)	Sublist 5	Sublist 5	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105090040-01	Mountain Lake Brook	Sublist 3	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
1	02040105090050-01	Furnace Brook	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105090060-01	Pequest River (below Furnace Brook)	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
1	02040105100010-01	Union Church Trib	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105100020-01	Honey Run	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105100030-01	Beaver Brook (above Hope Village)	Sublist 5	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105100040-01	Beaver Brook (below Hope Village)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105110010-01	Pophandusing Brook	Sublist 2	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105110020-01	Buckhorn Creek (incl UDRV)	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105110030-01	Delaware River Tribs (Rt 22 to Buckhorn Ck)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105120010-01	Lopatcong Creek (above Rt 57)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105120020-01	Lopatcong Creek (below Rt 57) incl UDRV	Sublist 5	Sublist 2	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105140010-01	Pohatcong Creek (above Rt 31)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105140020-01	Pohatcong Creek (Brass Castle Ck to Rt 31)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105140030-01	Pohatcong Creek (Edison Rd-Brass Castle Ck)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105140040-01	Merrill Creek	Sublist 2	Sublist 2	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
1	02040105140050-01	Pohatcong Creek (Merrill Ck to Edison Rd)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105140060-01	Pohatcong Creek (Springtown to Merrill Ck)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105140070-01	Pohatcong Creek below Springtown incl UDRV)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105150010-01	Weldon Brook / Beaver Brook	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105150020-01	Lake Hopatcong	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
1	02040105150030-01	Musconetcong River (Wills Bk to Lk Hopatcong)	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105150040-01	Lubbers Run (above/incl Dallis Pond)	Sublist 2	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105150050-01	Lubbers Run (below Dallis Pond)	Sublist 5	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105150060-01	Cranberry Lake / Jefferson Lake & Tribs	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
1	02040105150070-01	Musconetcong River (Waterloo to/incl Wills Bk)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105150080-01	Musconetcong River (SaxtonFalls to Waterloo)	Sublist 2	Sublist 2	Sublist 4A	Sublist 5	Sublist 3	Sublist 2	N/A	Sublist 3
1	02040105150090-01	Mine Brook (Morris Co)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3

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1	02040105150100-01	Musconetcong River (Trout Bk to Saxton Falls)	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 3
1	02040105160010-01	Musconetcong River (Hances Bk thru Trout Bk)	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105160020-01	Musconetcong River (Changewater to Hances B	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105160030-01	Musconetcong River (Rt 31 to Changewater)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105160040-01	Musconetcong River (75d 00m to Rt 31)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105160050-01	Musconetcong River (I-78 to 75d 00m)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105160060-01	Musconetcong River (Warren Glen to I-78)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
1	02040105160070-01	Musconetcong River (below Warren Glen)	Sublist 2	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105170010-01	Holland Twp (Hakihokake to Musconetcong)	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
11	02040105170020-01	Hakihokake Creek	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105170030-01	Harihokake Creek (and to Hakihokake Ck)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105170040-01	Nishisakawick Creek (above 40d 33m)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105170050-01	Nishisakawick Creek (below 40d 33m)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105170060-01	Kingwood Twp (Warford-Little Nishisakawk)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105170070-01	Kingwood Twp (Rt 519 to Warford Ck)	Sublist 2	Sublist 2	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
11	02040105200010-01	Lockatong Creek (above Rt 12)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 5	N/A	Sublist 3
11	02040105200020-01	Lockatong Creek (Milltown to Rt 12)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 5	N/A	Sublist 3
11	02040105200030-01	Lockatong Creek (below Milltown incl UDRV)	Sublist 5	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105200040-01	Wickecheoke Creek (above Locktown)	Sublist 4A	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105200050-01	Plum Creek	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105200060-01	Wickecheoke Creek (below Locktown)	Sublist 4A	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105210010-01	Alexauken Creek (above 74d 55m)	Sublist 2	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105210020-01	Alexauken Creek (below 74d 55m to 11BA06)	Sublist 2	Sublist 5	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105210030-01	Swan Creek (Moore Ck to Alexauken Ck)	Sublist 5	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
11	02040105210040-01	Moore Creek	Sublist 5	Sublist 5	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
11	02040105210050-01	Fiddlers Creek (Jacobs Ck to Moore Ck)	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
11	02040105210060-01	Jacobs Creek (above Woolsey Brook)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
11	02040105210070-01	Jacobs Creek (below/incl Woolsey Brook)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105210080-01	Mercer (Calhoun St to Jacobs Creek)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
11	02040105230010-01	Assunpink Creek (above Assunpink Lake)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
11	02040105230020-01	Assunpink Creek (New Sharon Br to/incl Lake)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 5
11	02040105230030-01	New Sharon Branch (Assunpink Creek)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
11	02040105230040-01	Assunpink Creek (Trenton Rd to New Sharon Br	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
11	02040105230050-01	Assunpink Creek (Shipetaukin to Trenton Rd)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
11	02040105230060-01	Shipetaukin Creek	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105240010-01	Shabakunk Creek	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
11	02040105240020-01	Shabakunk Creek WB	Sublist 3	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3

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11	02040105240030-01	Miry Run (Assunpink Cr)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105240040-01	Pond Run	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
11	02040105240050-01	Assunpink Creek (below Shipetaukin Ck)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201030010-01	Duck Creek and UDRV to Assunpink Ck	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
20	02040201040010-01	Brindle Lake and above (Jumping Brook)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
20	02040201040020-01	South Run (above 74d35m) (Ft Dix)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
20	02040201040030-01	South Run (Jumping Brook to 74d35m)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
20	02040201040040-01	Jumping Brook (Monmouth Co)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
20	02040201040050-01	South Run (North Run to Jumping Brook)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201040060-01	North Run (above Wrightstown bypass)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
20	02040201040070-01	Crosswicks Creek (New Egypt to/incl North Run)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 5
20	02040201050010-01	Lahaway Creek (above Prospertown)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201050020-01	Lahaway Creek (Allentwn/NE Road-Prospertowr	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201050030-01	Crosswicks Creek (Lahaway Ck to New Egypt)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201050040-01	Crosswicks Creek (Walnford to Lahaway Ck)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201050050-01	Crosswicks Creek (Ellisdale trib - Walnford)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201050060-01	Ellisdale Trib (Crosswicks Creek)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
20	02040201050070-01	Crosswicks Creek (Doctors Ck-Ellisdale trib)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 5
20	02040201060010-01	Doctors Creek (above 74d28m40s)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201060020-01	Doctors Creek (Allentown to 74d28m40s)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201060030-01	Doctors Creek (below Allentown)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201070010-01	Back Creek (above Yardville-H Sq Road)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201070020-01	Crosswicks Creek (below Doctors Creek)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201070030-01	Shady Brook / Spring Lake / Rowan Lake	Sublist 4A	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
20	02040201080010-01	Blacks Creek (above 40d06m10s)	Sublist 4A	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201080020-01	Blacks Creek (Bacons Run to 40d06m10s)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201080030-01	Blacks Creek (below Bacons Run)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201090010-01	Crafts Creek (above Rt 206)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201090020-01	Crafts Creek (below Rt 206)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201090030-01	Delaware River Tribs (Assiscunk Ck to Blacks Cl	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
20	02040201100010-01	Assiscunk Creek (above Rt 206)	Sublist 4A	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201100020-01	Barkers Brook (above 40d02m30s)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201100030-01	Jacksonville Trib (above Barkers Brook)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
20	02040201100040-01	Assiscunk Creek (Jacksonville Rd to Rt 206)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
20	02040201100050-01	Assiscunk Creek (Neck Rd to Jacksonville Rd)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201100060-01	Assiscunk Creek (below Neck Rd)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
20	02040201110010-01	Delaware River Tribs (Beverly to Assiscunk Ck)	Sublist 4A	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5

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19	02040202020010-01	Gaunts Brook / Hartshorne Mill Stream	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 3	N/A	N/A	Sublist 3
19	02040202020020-01	Ong Run / Jacks Run	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
19	02040202020030-01	Rancocas Creek NB (incl Mirror Lk-Gaunts Bk)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 3	N/A	N/A	Sublist 5
19	02040202020040-01	Rancocas Creek NB (NL dam to Mirror Lk)	Sublist 5	N/A	Sublist 5	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
19	02040202030010-01	Pole Bridge Branch (above County line)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
19	02040202030020-01	Mount Misery Brook NB (above 74d27m30s dam	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
19	02040202030030-01	Mount Misery Brook MB / NB (below 74d27m30s	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
19	02040202030040-01	Mount Misery Brook SB	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
19	02040202030050-01	Bucks Cove Run / Cranberry Branch	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 3	N/A	N/A	Sublist 5
19	02040202030060-01	Pole Bridge Branch (CountryLk dam - Co line)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
19	02040202030070-01	McDonalds Branch	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
19	02040202030080-01	Bisphams Mill Creek (below McDonalds Br)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
19	02040202030090-01	Greenwood Branch (below Country Lk & MM cor	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 5
19	02040202040010-01	Rancocas Creek NB (Pemberton br to NL dam)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 2	N/A	N/A	Sublist 3
19	02040202040020-01	Pemberton / Ft Dix Trib (NB Rancocas Ck)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
19	02040202040030-01	Rancocas Creek NB (Rt 206 to Pemberton br)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
19	02040202040040-01	Rancocas Creek NB (Smithville to Rt 206)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
19	02040202040050-01	Rancocas Creek NB (below Smithville)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
19	02040202050010-01	Burrs Mill Brook (above 39d51m30s road)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 2	N/A	N/A	Sublist 3
19	02040202050020-01	Burrs Mill Brook (Burnt Br Br- 39-51-30 rd)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 2	N/A	N/A	Sublist 3
19	02040202050030-01	Burrs Mill Brook (BurrsMill to Burnt Br Br)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 2	N/A	N/A	Sublist 3
19	02040202050040-01	Friendship Creek (above Burrs Mill Bk)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
19	02040202050050-01	Friendship Creek (below/incl Burrs Mill Bk)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	N/A	N/A	Sublist 3
19	02040202050060-01	Rancocas Creek SB (above Friendship Ck)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 3	N/A	N/A	Sublist 5
19	02040202050070-01	Jade Run	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
19	02040202050080-01	Rancocas Creek SB (Vincentown-FriendshipCk)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	N/A	N/A	Sublist 5
19	02040202050090-01	Rancocas Creek SB (Bobbys Run to Vincentowr	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
19	02040202060010-01	Kettle Run (above Centennial Lake)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 3	N/A	N/A	Sublist 3
19	02040202060020-01	Lake Pine / Centennial Lake & Tribs	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
19	02040202060030-01	Haynes Creek (below Lake Pine)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
19	02040202060040-01	Barton Run (above Kettle Run Road)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 3	N/A	Sublist 3
19	02040202060050-01	Barton Run (below Kettle Run Road)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	N/A	N/A	Sublist 3
19	02040202060060-01	Bear Swamp River	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
19	02040202060070-01	Little Creek (above Bear Swamp River)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
19	02040202060080-01	Rancocas Creek SW Branch (above Medford br)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
19	02040202060090-01	Little Creek (below Bear Swamp River)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
19	02040202060100-01	Rancocas Creek SW Branch (below Medford br)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5

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19	02040202070010-01	Bobbys Run	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
19	02040202070020-01	Rancocas Creek SB (Rt 38 to Bobbys Run)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
19	02040202070030-01	Rancocas Creek SB (below Rt 38)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
19	02040202080010-01	Parkers Creek (above Marne Highway)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
19	02040202080020-01	Rancocas Creek (Martins Beach to NB/SB)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
19	02040202080030-01	Mill Creek (Willingboro)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
19	02040202080040-01	Rancocas Creek (Rt 130 to Martins Beach)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
19	02040202080050-01	Rancocas Creek (below Rt 130)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202090010-01	Swede Run	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202090020-01	Pompeston Creek (above Rt 130)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
18	02040202090030-01	Pompeston Creek (below Rt130/Swede to 40d)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202100010-01	Pennsauken Creek NB (above NJTPK)	Sublist 2	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
18	02040202100020-01	Pennsauken Creek NB (incl StrwbrdgLk-NJTPK)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202100030-01	Pennsauken Creek NB (below Strawbridge Lk)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
18	02040202100040-01	Pennsauken Creek SB (above Rt 41)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
18	02040202100050-01	Pennsauken Creek SB (below Rt 41)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
18	02040202100060-01	Pennsauken Creek (below NB / SB)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202110010-01	Cooper River NB(above Springdale Road)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202110020-01	Cooper River NB(below Springdale Road)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202110030-01	Cooper River (above Evesham Road)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 5
18	02040202110040-01	Cooper River (Wallworth gage to Evesham Rd)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 5
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 5	Sublist 2	N/A	Sublist 5
18	02040202110060-01	Cooper River (below Rt 130)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202110070-01	Delaware River Tribs (Pennsauken Ck to 28th St	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
18	02040202120010-01	Big Timber Creek NB (above Laurel Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202120020-01	Big Timber Creek NB (below Laurel Rd)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202120030-01	Big Timber Creek SB (above Lakeland Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202120040-01	Big Timber Creek SB (incl Bull Run to Lakeland I	Sublist 4A	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202120050-01	Big Timber Creek SB (below Bull Run)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202120060-01	Almonesson Creek	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202120070-01	Little Timber Creek (Gloucester City)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202120080-01	Big Timber Creek (below NB/SB confl)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202120100-01	Woodbury Creek (above Rt 45)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202120110-01	Woodbury Creek (below Rt 45/LDRV to B T Ck)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202120120-01	Main Ditch / Little Mantua Creek	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202130010-01	Mantua Creek (above Rt 47)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
18	02040202130020-01	Mantua Creek (road to Sewell to Rt 47)	Sublist 4A	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
18	02040202130030-01	Chestnut Branch (above Sewell)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202130040-01	Mantua Creek (Edwards Run to rd to Sewell)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202130050-01	Edwards Run	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 5
18	02040202130060-01	Mantua Creek (below Edwards Run)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202140010-01	Nehonsey Brook / Clonmell Creek (LDRV to Mar	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
18	02040202140020-01	Still Run / London Branch (above Tomlin Sta Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
18	02040202140030-01	Pargay Creek	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
18	02040202140040-01	Moss Branch / Little Timber Creek (Repaupo)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202140050-01	Repaupo Creek (below Tomlin Sta Rd) / Cedar S	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202150010-01	Raccoon Creek (above Clems Run)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 3
18	02040202150020-01	Raccoon Creek (Rt 45 to/incl Clems Run)	Sublist 3	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
18	02040202150030-01	Raccoon Creek SB	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
18	02040202150040-01	Raccoon Creek (Russell Mill Rd to Rt 45)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202150050-01	Raccoon Creek (Swedesboro Rd-Russel Mill Rd	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
18	02040202150060-01	Raccoon Creek (below Swedesboro rd)/ Birch C	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
18	02040202160010-01	Oldmans Creek (above Commissioners Rd)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
18	02040202160020-01	Oldmans Creek (Rt 45 to Commissioners Rd)	Sublist 4A	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202160030-01	Oldmans Creek (Kings Hwy to Rt 45)	Sublist 4A	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
18	02040202160040-01	Beaver Creek (Oldmans Creek)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
18	02040202160050-01	Oldmans Creek (Center Sq Rd to KingsHwy)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
18	02040202160060-01	Oldmans Creek (below Center Sq Rd)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040204910010-01	Delaware Bay (CapeMay Pt to Dennis Ck) insho	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040204910010-02	Delaware Bay (Cape May Pt to Dennis Ck) offsh	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040204910020-01	Delaware Bay (DennisCk to Egg Islnd Pt) inshore	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 5	Sublist 5
17	02040204910020-02	Delaware Bay (Dennis Ck to Egg Islnd Pt) offsho	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040204910030-01	Delaware Bay (Egg Is Pt to Cohansey R) inshore	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040204910030-02	Delaware Bay (Egg Is Pt to Cohansey R) offshor	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 5	Sublist 5
17	02040206020010-01	Delaware River Tribs (Lakeview Ave to Oldmans	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206020020-01	Delaware River Tribs (Marsh Pt-Main St Pennsvi	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206030010-01	Salem River (above Woodstown gage)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206030020-01	Nichomus Run	Sublist 2	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206030030-01	Salem River (County Home Rd to Woodstown ga	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206030040-01	Salem River (Courses Landing to County Home	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
17	02040206030050-01	Game Creek (above Rt 48)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206030060-01	Salem River (39-40-14 dam-CoursesLndg) / Car	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
17	02040206030070-01	Game Creek (below Rt 48)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206040010-01	Mannington Creek	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206040020-01	Fenwick Creek / Keasbeys Creek	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206040030-01	Salem River (Fenwick Ck to 39d40m14s dam)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206040040-01	Salem River (below Fenwick Creek)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206060010-01	Cool Run	Sublist 2	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206060020-01	Alloway Creek (above Alloway-Woodstown Rd)	Sublist 5	N/A	Sublist 3	Sublist 5	Sublist 2	Sublist 5	N/A	Sublist 3
17	02040206060030-01	Cedar Brook / Carlisle Run	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206060040-01	Deep Run (Alloway)	Sublist 2	N/A	Sublist 3	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206060050-01	Alloway Creek (Quinton to Alloway-Wdstwn Rd)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206060060-01	Alloway Creek (New Bridge to Quinton)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206060070-01	Harmony Trib (Alloway Creek)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 2	Sublist 5
17	02040206060080-01	Alloway Creek (Hancocks Bridge to New Bridge)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206060090-01	Alloway Creek (below Hancocks Bridge to Salem	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206060100-01	Hope Creek / Artificial Island	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206070010-01	Fishing Creek / Bucks Ditch / Pattys Fork	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206070020-01	Mad Horse Creek / Little Creek / Turners Fork	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206070030-01	Canton Drain (above Maskell Mill)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206070040-01	Canton Drain (below Maskell Mill)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206070050-01	Stow Creek (above Jericho Road)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206070060-01	Stow Creek (Canton Road to Jericho Road)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206070070-01	Raccoon Ditch (Stow Creek)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 5
17	02040206070080-01	Stow Creek (below Canton Rd)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206070090-01	Phillips Creek / Jacobs Creek	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206080010-01	Cohansey River (above Beals Mill)	Sublist 4A	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206080020-01	Cohansey River (incl HandsPond - Beals Mill)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206080030-01	Parsonage Run / Foster Run	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206080040-01	Cohansey River (incl Beebe Run to Hands Pond	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206080050-01	Cohansey River (incl CornwellRun - Beebe Run)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206090010-01	Barrett Run (above West Ave)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206090020-01	Indian Fields Branch / Jackson Run	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206090030-01	Cohansey River (Rocaps Run to Cornwell Run)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 5
17	02040206090040-01	Mill Creek (above/incl Maple House Bk)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206090050-01	Mill Creek (below Maple House Bk)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206090060-01	Cohansey River (75d15m to/incl Rocaps Run)	Sublist 4A	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206090070-01	Cohansey River (75d17m50s to 75d15m)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206090080-01	Cohansey River (Greenwich to 75d17m50s)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5

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17	02040206090090-01	Pine Mount Creek	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
17	02040206090100-01	Cohansey River (below Greenwich)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 5
17	02040206100010-01	Middle Marsh Creek (DrumboCk to Sea Breeze)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 5
17	02040206100020-01	Bridges Sticks Creek / Ogden Creek	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206100030-01	Back Creek (Sea Breeze Rd to Cedar Ck)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206100040-01	Cedar Creek (above Rt 553)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206100050-01	Cedar Creek (below Rt 553)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 5
17	02040206100060-01	Nantuxent Creek (above Newport Landing)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 4A	Sublist 5
17	02040206100070-01	Nantuxent Creek (below Newport Landing)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 5
17	02040206110010-01	Newport Neck (Nantuxent to Beadons Ck)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206110020-01	Fortesque Creek / Fishing Creek / Straight Creek	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206110030-01	Oranoaken Creek	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206110040-01	Mill Creek (Dividing Creek)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
17	02040206110050-01	Dividing Creek (above Mill Creek)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206110060-01	Dividing Creek (below Mill Creek)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206110070-01	New England Creek (Kenny Pt to Elder Pt)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 5
17	02040206120010-01	Little Ease Run (above Academy Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206120020-01	Little Ease Run (below Academy Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206120030-01	Still Run (above Silver Lake Road)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206120040-01	Reed Branch (Still Run)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206120050-01	Still Run (Willow Grove Lk - Silver Lake Rd)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206130010-01	Scotland Run (above Fries Mill)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206130020-01	Scotland Run (Delsea Drive to FriesMill)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206130030-01	Indian Branch (Scotland Run)	Sublist 2	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206130040-01	Scotland Run (below Delsea Drive)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206140010-01	Maurice River (Balckwater Br to/incl Willow Grov	Sublist 2	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206140020-01	Burnt Mill Branch / Hudson Branch	Sublist 2	N/A	Sublist 4A	Sublist 5	Sublist 3	Sublist 2	N/A	Sublist 3
17	02040206140030-01	Green Branch / Endless Branch	Sublist 2	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206140040-01	Blackwater Branch (above/incl Pine Br)	Sublist 2	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206140050-01	Blackwater Branch (below Pine Branch)	Sublist 2	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206140060-01	Maurice River (Sherman Ave to Blackwater Br)	Sublist 2	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206140070-01	Parvin Branch / Tarkiln Branch	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206150010-01	Muddy Run (above/incl Elmer Lake)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206150020-01	Muddy Run (incl Palatine Lk to Elmer Lk)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206150030-01	Palatine Branch (Muddy Run)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206150040-01	Indian Run (Muddy Run)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206150050-01	Muddy Run (incl Parvin Lk to Palatine Lk)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3

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17	02040206150060-01	Muddy Run (Landis Ave to Parvin Lake)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206150070-01	Muddy Run (below Landis Ave)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206160010-01	Lebanon Branch (Mill Creek)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206160020-01	Chatfield Branch (Mill Creek)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206160030-01	Maurice River (Union Lake to Sherman Ave)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206170010-01	Hankins Pond Trib (Millville)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
17	02040206170020-01	White Marsh Run (Millville)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206170030-01	Maurice River (Menantico Ck to Union Lake)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206170040-01	Buckshutem Creek (above Rt 555)	Sublist 2	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
17	02040206170050-01	Buckshutem Creek (below Rt 555)	Sublist 2	N/A	Sublist 5	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206180010-01	Panther Branch (Menantico Creek)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206180020-01	Cedar Branch (Menantico Creek)	Sublist 4A	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 3
17	02040206180030-01	Menantico Creek (above Rt 552)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206180040-01	Berryman Branch (Menantico Creek)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
17	02040206180050-01	Menantico Creek (below Rt 552)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206190010-01	Manumuskin River (above/incl Big Neal Br)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 3	N/A	Sublist 3
17	02040206190020-01	Manumuskin River (Rt 49 to Big Neal Br)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 3	N/A	Sublist 3
17	02040206190030-01	Manumuskin River (below Rt 49)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
17	02040206200010-01	Middle Branch / Slab Branch	Sublist 2	N/A	Sublist 3	Sublist 5	Sublist 3	N/A	N/A	Sublist 5
17	02040206200020-01	Muskee Creek	Sublist 2	N/A	Sublist 3	Sublist 5	Sublist 3	N/A	Sublist 2	Sublist 5
17	02040206200030-01	Maurice River (Rt 548 to Menantico Ck)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
17	02040206200040-01	Maurice River (Leesburg to Rt 548)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 5
17	02040206200050-01	Maurice River (below Leesburg to East Pt)	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 4A	Sublist 5
16	02040206210010-01	Riggins Ditch (Moores Beach to East Pt)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 5
16	02040206210020-01	West Creek (above Rt 550)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
16	02040206210030-01	West Creek (Paper Mill Rd to Rt 550)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
16	02040206210040-01	West Creek (below Paper Mill Rd to Moores Bch	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 5	Sublist 5
16	02040206210050-01	Savages Run (above East Creek Pond)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
16	02040206210060-01	East Creek	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 5	Sublist 5
16	02040206220010-01	Dennis Creek / Cedar Swamp (Rt 47 to Rt 550)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040206220020-01	Sluice Creek	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 5	Sublist 5
16	02040206220030-01	Dennis Creek (Jakes Landing Rd to Rt 47)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 5	Sublist 5
16	02040206220040-01	Dennis Creek (below Jakes Landing Rd)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 5	Sublist 5
16	02040206230010-01	Bidwell Creek (above Rt 47)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 5
16	02040206230020-01	Bidwell Creek (below Rt 47-Dias to Goshen Ck)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 5
16	02040206230030-01	Dias Creek	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040206230040-01	Green Creek (Norburys Landng to Pierces Pt)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5

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16	02040206230050-01	Fishing Creek / Fishing Mill Stream	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040206230060-01	Cox Hall Creek / Mickels Run (to Villas)	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040206230070-01	Pond Creek / Cape May Canal West	Sublist 3	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301020010-01	Metedeconk River NB (above I-195)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
13	02040301020020-01	Metedeconk River NB (Rt 9 to I-195)	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
13	02040301020030-01	Haystack Brook	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
13	02040301020040-01	Muddy Ford Brook	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 5
13	02040301020050-01	Metedeconk River NB (confluence to Rt 9)	Sublist 5	Sublist 5	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
13	02040301030010-01	Metedeconk River SB (above I-195 exit 2)	Sublist 2	N/A	Sublist 3	Sublist 5	Sublist 3	Sublist 2	N/A	Sublist 3
13	02040301030020-01	Metedeconk River SB (74d19m15s to I-195 X21)	Sublist 2	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
13	02040301030030-01	Metedeconk River SB (BennettsPd to 74d19m15	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 3
13	02040301030040-01	Metedeconk River SB (Rt 9 to Bennetts Pond)	Sublist 2	Sublist 3	Sublist 4A	Sublist 5	Sublist 3	Sublist 2	N/A	Sublist 5
13	02040301030050-01	Metedeconk River SB (confluence to Rt 9)	Sublist 2	N/A	Sublist 4A	Sublist 5	Sublist 2	Sublist 2	N/A	Sublist 3
13	02040301040010-01	Beaverdam Creek	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	Sublist 4A	Sublist 3
13	02040301040020-01	Metedeconk River (Beaverdam Ck to confl)	Sublist 2	N/A	Sublist 5	Sublist 5	Sublist 2	Sublist 2	Sublist 4A	Sublist 3
13	02040301040030-01	Metedeconk River (below Beaverdam Creek)	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 3
13	02040301050010-01	Kettle Creek (above Lake Riviera outlet)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
13	02040301050020-01	Kettle Creek (below Lake Riviera outlet)	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 3
13	02040301050030-01	Metedekunk Neck Tribs (below Heron Is)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 3
13	02040301050040-01	Barnegat North Tribs (Tide Ck to Rt 37)	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	N/A	Sublist 3
13	02040301050050-01	Barnegat Bay North (above Rt 37 bridge)	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 4A	Sublist 3
13	02040301060010-01	Toms River (above Francis Mills)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
13	02040301060020-01	Toms River (74-22-30 rd to Francis Mills)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 3	N/A	Sublist 3
13	02040301060030-01	Toms River (Bowman Rd to 74-22-30 road)	Sublist 5	Sublist 5	Sublist 4A	Sublist 2	Sublist 2	Sublist 3	N/A	Sublist 3
13	02040301060040-01	Maple Root Branch (Toms River)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
13	02040301060050-01	Dove Mill Branch (Toms River)	Sublist 3	Sublist 3	Sublist 4A	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 5
13	02040301060060-01	Toms River (Hope Chapel Rd to Bowman Rd)	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
13	02040301060070-01	Toms River (Rt 70 to Hope Chapel Road)	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 3
13	02040301060080-01	Toms River (Oak Ridge Parkway to Rt 70)	Sublist 2	Sublist 2	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
13	02040301070010-01	Shannae Brook	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
13	02040301070020-01	Harris Branch / Bordens Mill Branch	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
13	02040301070030-01	Ridgeway Branch (Hope Chapel Rd to Harris Br)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
13	02040301070040-01	Ridgeway Branch (below Hope Chapel Rd)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
13	02040301070050-01	Blacks Branch (above 74d22m05s)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 3	N/A	N/A	Sublist 3
13	02040301070060-01	Old Hurricane Brook (above 74d22m30s)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
13	02040301070070-01	Old Hurricane Brook (below 74d22m30s)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
13	02040301070080-01	Manapaqua Brook	Sublist 2	N/A	Sublist 5	Sublist 5	Sublist 2	N/A	N/A	Sublist 5

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13	02040301070090-01	Union Branch (below Blacks Br 74d22m05s)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
13	02040301080010-01	Wrangel Brook (above Michaels Branch)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
13	02040301080020-01	Michaels Branch (Wrangel Brook)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
13	02040301080030-01	Davenport Branch (above Pinewald Road)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
13	02040301080040-01	Davenport Branch (below Pinewald Road)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
13	02040301080050-01	Wrangel Brook (below Michaels Branch)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
13	02040301080060-01	Toms River Lwr (Rt 166 to Oak Ridge Pkwy)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 5
13	02040301080070-01	Jakes Branch (Lower Toms River)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
13	02040301080080-01	Long Swamp Creek	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 3	N/A	Sublist 3
13	02040301080090-01	Toms River Lwr (below Rt 166)	Sublist 5	N/A	Sublist 5	N/A	N/A	N/A	Sublist 4A	Sublist 5
13	02040301090010-01	Webbs Mill Branch	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
13	02040301090020-01	Chamberlain Branch	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
13	02040301090030-01	Cedar Creek (74-16-38 to Chamberlain Br)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
13	02040301090040-01	Factory Branch / Newbolds Branch / Daniels Bra	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
13	02040301090050-01	Cedar Creek (GS Parkway to 74d16m38s)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
13	02040301090060-01	Cedar Creek (below GS Parkway)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	Sublist 4A	Sublist 3
13	02040301100010-01	Barnegat Cntrl Tribs (Rt 37 to Cedar Ck)	Sublist 3	N/A	Sublist 2	N/A	N/A	N/A	N/A	Sublist 3
13	02040301100020-01	Barnegat Cntrl Tribs (CedarCk - Forked R)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 3
13	02040301100030-01	Barnegat Bay Central (Rt 37- Brngt Inlet)	Sublist 2	N/A	Sublist 5	N/A	N/A	N/A	Sublist 2	Sublist 3
13	02040301110010-01	Forked River NB (above old RR grade)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
13	02040301110020-01	Forked River NB (below old RR grade)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	Sublist 1	N/A	Sublist 3
13	02040301110030-01	Forked River (below NB incl Mid/South Br)	Sublist 2	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 3
13	02040301110040-01	Oyster Creek (above Rt 532)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
13	02040301110050-01	Oyster Creek (below Rt 532)	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	N/A	Sublist 3
13	02040301120010-01	Waretown Creek / Lochiel Creek	Sublist 2	N/A	Sublist 3	N/A	N/A	Sublist 2	Sublist 2	Sublist 3
13	02040301120020-01	Barnegat South Tribs (below Lochiel Ck)	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
13	02040301120030-01	Barnegat Bay South (Brngt Inlet-Surf City)	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
13	02040301130010-01	Four Mile Branch (Mill Creek)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
13	02040301130020-01	Mill Creek (above GS Parkway)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
13	02040301130030-01	Mill Creek (below GS Parkway) / Manahawkin Cl	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 3	Sublist 2	Sublist 3
13	02040301130040-01	Cedar Run	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	Sublist 4A	Sublist 3
13	02040301130050-01	Westecunk Creek (above GS Parkway)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
13	02040301130060-01	Westecunk Creek (below GS Parkway)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 5	Sublist 3
13	02040301130070-01	Dinner Point Creek & Tribs	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 5	Sublist 3
13	02040301130080-01	Manahawkin Bay / Little Egg Bay (to Westecunk	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
13	02040301140010-01	Mill Branch (above GS Parkway)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
13	02040301140020-01	Mill Branch (below GS Parkway)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3

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13	02040301140030-01	Tuckerton Creek (below Mill Branch)	Sublist 4A	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 3
13	02040301140040-01	Little Egg Harbor Bay Tribs (Westecunk Ck-Tuc	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
13	02040301140050-01	Little Egg Harbor Bay Tribs (Willis Creek to LE In	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
13	02040301140060-01	Little Egg Harbor Bay (Westecunk to Inlet)	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
14	02040301150010-01	Batsto River (above Hampton Gate)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301150020-01	Skit Branch (Batsto River)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
14	02040301150030-01	Indian Mills Brook / Muskingum Brook	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301150040-01	Springers Brook / Deep Run	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301150050-01	Batsto River (CNJRR to Hampton Gate)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301150060-01	Batsto River (Quaker Bridge to CNJRR)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301150070-01	Penn Swamp Branch	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301150080-01	Batsto River (Batsto gage to Quaker Bridge)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
14	02040301160010-01	Alquatka Branch	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301160020-01	Mullica River (above Jackson Road)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
14	02040301160030-01	Mullica River (Rt 206 to Jackson Road)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
14	02040301160040-01	Wisickaman Creek	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301160050-01	Hays Mill Creek (above Tremont Ave)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301160060-01	Sleeper Branch (Rt 206 to Tremont Ave)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301160070-01	Pump Branch (above 74d53m road)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301160080-01	Pump Branch (below 74d53m road)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301160090-01	Clark Branch (above/incl Price Branch)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301160100-01	Blue Anchor Brook	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301160110-01	Albertson Brook / Gun Branch	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301160120-01	Great Swamp Branch (above Rt 206)	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 2	N/A	N/A	Sublist 3
14	02040301160130-01	Great Swamp Branch (below Rt 206)	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 2	N/A	N/A	Sublist 3
14	02040301160140-01	Mullica River (39d40m30s to Rt 206)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
14	02040301160150-01	Mullica River (Pleasant Mills to 39d40m30s)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
14	02040301170010-01	Hammonton Creek (above 74d43m)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	N/A	N/A	Sublist 5
14	02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	Sublist 5	N/A	Sublist 4A	Sublist 5	Sublist 2	N/A	N/A	Sublist 5
14	02040301170030-01	Hammonton Creek (below Columbia Rd)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301170040-01	Mullica River (Batsto R to Pleasant Mills)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
14	02040301170050-01	Bull Creek / Little Bull Creek	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301170060-01	Mullica River (Rt 563 to Batsto River)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	N/A	Sublist 4A	Sublist 5
14	02040301170070-01	Nergo Creek	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301170080-01	Mullica River (Lower Bank Rd to Rt 563)	Sublist 5	N/A	Sublist 4A	Sublist 3	Sublist 3	N/A	Sublist 4A	Sublist 5
14	02040301170090-01	Indian Cabin Creek	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301170100-01	Landing Creek (above Rt 563)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	N/A	N/A	Sublist 3

WMA	Assessment Unit ID	Assessment Unit Name	Aquatic Life (general)	Aquatic Life (trout)	Recre-ation	Drinking Water Supply	Agricul-tural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consump-tion
14	02040301170110-01	Landing Creek (Indian Cabin Ck to Rt 563)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301170120-01	Landing Creek (below Indian Cabin Ck)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	Sublist 2	Sublist 3
14	02040301170130-01	Mullica River (Turtle Ck to Lower Bank Rd)	Sublist 2	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 5
14	02040301180010-01	Yellow Dam Branch	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301180020-01	Oswego River (above Rt 539)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301180030-01	Plains Branch (Oswego River)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
14	02040301180040-01	Oswego River (Sim Place Resv to Rt 539)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301180050-01	Papoose Branch (Oswego River)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 3
14	02040301180060-01	Oswego River (Andrews Rd to Sim Place Resv)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301180070-01	Oswego River (below Andrews Road)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 5
14	02040301190010-01	Shoal Branch (above/incl Pope Branch)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301190020-01	Wading River WB (above Rt 532)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301190030-01	Wading River WB (Rt 563 to Rt 532)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301190040-01	Shoal Branch (below Pope Branch)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301190050-01	Wading River WB (Jenkins Rd to Rt 563)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
14	02040301190060-01	Tulpehocken Creek	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301190070-01	Wading River WB (Oswego R to Jenkins Rd)	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	N/A	N/A	Sublist 5
14	02040301200010-01	Beaver Branch (Wading River)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
14	02040301200020-01	Wading River (Rt 542 to Oswego River)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
14	02040301200030-02	Wading River (below Rt 542)	Sublist 2	N/A	Sublist 2	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
14	02040301200040-02	Bass River WB	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301200050-02	Bass River EB	Sublist 4A	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
14	02040301200060-02	Bass River (below WB / EB)	Sublist 2	N/A	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 4A	Sublist 3
14	02040301200070-02	Ballanger Creek	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
14	02040301200080-02	Mullica River (GSP bridge to Turtle Ck)	Sublist 2	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 5
14	02040301200090-02	Clarks Mill Stream	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
14	02040301200100-02	Morses Mill Stream	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 3	Sublist 2	N/A	Sublist 3
14	02040301200110-02	Mattix Run (Nacote Creek)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	Sublist 2	Sublist 3
14	02040301200120-02	Nacote Creek (below/incl Mill Pond)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 3
14	02040301210010-02	Mullica River (below GSP bridge)	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 5
14	02040301210020-02	Mott Creek (Oysterbed Pt to Oyster Ck)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
14	02040301210030-02	Little Bay & Tribs	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
14	02040301210040-02	Great Bay & Tribs	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
13	02040301910010-01	Atlantic Ocean (Manasquan/Herring Is) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301910010-02	Atlantic Ocean (Manasquan/Herring Is) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301910020-01	Atlantic Ocean (Herring Is to Rt 37) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301910020-02	Atlantic Ocean (Herring Is to Rt 37) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5

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13	02040301910030-01	Atlantic Ocean (Rt 37 to Barnegat Inlet) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301910030-02	Atlantic Ocean (Rt 37 to Barnegat Inlet) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301920010-01	Atlantic Ocean (Barnegat to Surf City)inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301920010-02	Atlantic Ocean (Barnegat to Surf City) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301920020-01	Atlantic Ocean (Surf City to Haven Be) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301920020-02	Atlantic Ocean (Surf City to Haven Be) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301920030-01	Atlantic Ocean (Haven Bch to Lit Egg) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
13	02040301920030-02	Atlantic Ocean (Haven Bch to Lit Egg) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
15	02040302010010-01	Reeds Bay / Absecon Bay & Tribs	Sublist 4A	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 3
15	02040302020010-01	Absecon Creek NB	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
15	02040302020020-01	Absecon Creek SB	Sublist 2	N/A	Sublist 2	Sublist 5	Sublist 2	N/A	N/A	Sublist 5
15	02040302020030-01	Absecon Creek (AC Reserviors) (gage to SB)	Sublist 2	N/A	Sublist 2	Sublist 5	Sublist 2	Sublist 3	N/A	Sublist 5
15	02040302020040-01	Absecon Creek (below gage)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 5
15	02040302030010-01	Great Egg Harbor River (above New Freedom R	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302030020-01	Great Egg Harbor River (AC Expressway to New	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
15	02040302030030-01	Four Mile Branch (GEHR)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	Sublist 2	N/A	Sublist 3
15	02040302030040-01	Great Egg Harbor River (Broad Lane road to AC	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302030050-01	Squankum Branch (GEHR)	Sublist 5	N/A	Sublist 5	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302030060-01	Great Egg Harbor River (Piney Hollow Rd to Bro	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302030070-01	Penny Pot Stream (GEHR)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302030080-01	Great Egg Harbor River (Hospitality Br to Piney H	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040010-01	Hospitality Branch (above Whitehouse Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040020-01	Hospitality Branch (Rt 538 to Whitehouse Rd)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040030-01	Hospitality Branch (Piney Hollow Rd to Rt 538)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040040-01	White Oak Branch (Hospitality Branch)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302040050-01	Collings Lakes trib (Hospitality Branch)	Sublist 5	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 5
15	02040302040060-01	Three Pond Branch (Hospitality Branch)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302040070-01	Hospitality Branch (below Piney Hollow Rd)	Sublist 5	N/A	Sublist 4A	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040080-01	Great Egg Harbor River (39d32m50s to Hospital	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040090-01	Great Egg Harbor River (Rt 322 to 39d32m50s)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040100-01	Makepeace Stream (above Makepeace Lake)	Sublist 3	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302040110-01	Great Egg Harbor River (Mare Run to Rt 322)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040120-01	Deep Run (GEHR)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302040130-01	Great Egg Harbor River (Lake Lenape to Mare R	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 5
15	02040302050010-01	Watering Race Branch (Babcock Creek)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302050020-01	Babcock Creek (GEHR)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302050030-01	South River (above 39d26m15s)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3

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15	02040302050040-01	South River (below 39d26m15s)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	Sublist 3	N/A	Sublist 3
15	02040302050050-01	Gravelly Run (above Gravelly Run road)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302050060-01	Great Egg Harbor River (Miry Run to Lake Lenap	Sublist 5	N/A	Sublist 3	N/A	Sublist 3	Sublist 3	N/A	Sublist 5
15	02040302050070-01	Miry Run (GEHR)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302050080-01	Stephen Creek (GEHR)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	Sublist 4A	Sublist 3
15	02040302050090-01	English Creek / Flat Creek / Cranberry Creek	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 3
15	02040302050100-01	Gibson Creek / Jackson Creek	Sublist 1	N/A	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 1	Sublist 3
15	02040302050110-01	Lakes Creek (GEHR)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 4A	Sublist 3
15	02040302050120-01	Middle River / Peters Creek	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
15	02040302050130-01	Great Egg Harbor River (GEH Bay to Miry Run)	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 5
15	02040302060010-01	Mill Branch (above Cardiff-Bargaintown rd)	Sublist 2	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302060020-01	Maple Run / Mill Branch (Zion Rd to Cardiff rd)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	Sublist 2	N/A	Sublist 3
15	02040302060030-01	Patcong Creek (Somers Ave to Zion Rd)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
15	02040302060040-01	Great Egg Harbor Bay / Lakes Bay / Skull Bay / I	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 3
15	02040302070010-01	Tuckahoe River (above Cumberland Ave)	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302070020-01	Tuckahoe River (39d19m52s to Cumberland Ave	Sublist 5	N/A	Sublist 3	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302070030-01	McNeals Branch (Tuckahoe River)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302070040-01	Tuckahoe River (Rt 49 to 39d19m52s)	Sublist 5	N/A	Sublist 2	Sublist 2	Sublist 2	N/A	N/A	Sublist 3
15	02040302070050-01	Tarkiln Brook (Tuckahoe River)	Sublist 2	N/A	Sublist 3	Sublist 3	Sublist 3	N/A	N/A	Sublist 3
15	02040302070060-01	Mill Creek / Back Run (Tuckahoe River)	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
15	02040302070070-01	Halfway Creek	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
15	02040302070080-01	Cedar Swamp Creek / Cedar Swamp (above Rt	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
15	02040302070090-01	Cedar Swamp Creek (below Rt 50)	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
15	02040302070100-01	Willis Thorofare / Hughes Creek	Sublist 3	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
15	02040302070110-01	Tuckahoe River (below Rt 49)	Sublist 5	N/A	Sublist 3	N/A	N/A	N/A	Sublist 2	Sublist 3
16	02040302080010-01	Crook Horn Creek (above Devils Island)	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 5	Sublist 3
16	02040302080020-01	Corson Inlet & Sound / Ludlam Bay	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
16	02040302080030-01	Mill Creek / Sunks Creek / Big Elder Creek	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	Sublist 5	Sublist 3
16	02040302080040-01	Cape May Bays (Reubens Wharf-Big Elder Ck)	Sublist 1	N/A	Sublist 1	N/A	N/A	N/A	Sublist 1	Sublist 3
16	02040302080050-01	Cape May Courthouse Tribs	Sublist 2	N/A	Sublist 3	N/A	N/A	N/A	N/A	Sublist 3
16	02040302080060-01	Mommy Teal Creek / Cresse Creek / Gravelly Ru	Sublist 3	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 3
16	02040302080070-01	Cape May Bays (Rt 47 to Reubens Wharf)	Sublist 2	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 3
16	02040302080080-01	Mill Creek / Jones Creek / Taylor Creek	Sublist 3	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 3
16	02040302080090-01	Cape May Harbor & Bays (below Rt 47)	Sublist 2	N/A	Sublist 2	N/A	N/A	N/A	Sublist 4A	Sublist 3
14	02040302910010-01	Atlantic Ocean (Ltl Egg to Absecon In) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
14	02040302910010-02	Atlantic Ocean (Ltl Egg to Absecon In) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
15	02040302920010-01	Atlantic Ocean (Absecon In to Ventnor) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5

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15	02040302920010-02	Atlantic Ocean (Absecon In to Ventnor) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
15	02040302920020-01	Atlantic Ocean (Ventnor to Great Egg) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
15	02040302920020-02	Atlantic Ocean (Ventnor to Great Egg) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
15	02040302930010-01	Atlantic Ocean (Great Egg to 34th St) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
21	02040302930010-02	Atlantic Ocean (Great Egg to 34th St) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040302940010-01	Atlantic Ocean (34th St to Corson Inl) inshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040302940010-02	Atlantic Ocean (34th St to Corson Inl) offshore	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040302940040-01	Atlantic Ocean (Hereford to Cape May In) inshor	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040302940040-02	Atlantic Ocean (Hereford to Cape May In) offsho	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040302940050-01	Atlantic Ocean (CM Inlet to Cape May Pt) inshor	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
16	02040302940050-02	Atlantic Ocean (CM Inlet to Cape May Pt) offsho	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 2	Sublist 5
Zone 1	Delaware River 1	Delaware River 1C2	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 10	Delaware River 1E1	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 11	Delaware River 1E2	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 12	Delaware River 1E3	Sublist 5	N/A	Sublist 5	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 13	Delaware River 1E4	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 14	Delaware River 1E5	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 2	Delaware River 15	Delaware River 2	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 3	Delaware River 16	Delaware River 3	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 4	Delaware River 17	Delaware River 4	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	N/A	Sublist 5
Zone 5	Delaware River 18	Delaware River 5A	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	N/A	Sublist 5
Zone 5	Delaware River 19	Delaware River 5B	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	N/A	Sublist 5
Zone 1	Delaware River 2	Delaware River 1C3	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 5	Delaware River 20	Delaware River 5C	Sublist 5	N/A	Sublist 2	N/A	N/A	N/A	Sublist 5	Sublist 5
Zone 1	Delaware River 3	Delaware River 1C4	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 4	Delaware River 1D1	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 5	Delaware River 1D2	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 6	Delaware River 1D3	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 7	Delaware River 1D4	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 8	Delaware River 1D5	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5
Zone 1	Delaware River 9	Delaware River 1D6	Sublist 5	N/A	Sublist 2	Sublist 5	Sublist 3	Sublist 3	N/A	Sublist 5

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
02	02020007010010-01	Wallkill R/Lake Mohawk(above Sparta Sta)	Cause Unknown	L
02	02020007010020-01	Wallkill R (Ogdensburg to SpartaStation)	Cause Unknown	L
02	02020007010020-01	Wallkill R (Ogdensburg to SpartaStation)	Temperature	L
02	02020007010040-01	Wallkill R(Hamburg SW Bdy to Ogdensburg)	Cause Unknown	L
02	02020007010040-01	Wallkill R(Hamburg SW Bdy to Ogdensburg)	Temperature	L
02	02020007010060-01	Beaver Run	Cause Unknown	L
02	02020007010070-01	Wallkill R(Martins Rd to Hamburg SW Bdy)	Total Dissolved Solids	L
02	02020007010070-01	Wallkill R(Martins Rd to Hamburg SW Bdy)	Phosphorus	L
02	02020007020030-01	Papakating Ck(Pellettown-Frankford Plns)	Unknown Toxic	L
02	02020007020060-01	Clove Brook (Papakating Ck)	Cause Unknown	L
02	02020007020060-01	Clove Brook (Papakating Ck)	Temperature	L
02	02020007020060-01	Clove Brook (Papakating Ck)	E. Coli	H
02	02020007020070-01	Papakating Creek (below Pellettown)	Cause Unknown	L
02	02020007030010-01	Wallkill R(41d13m30s to Martins Road)	Cause Unknown	L
02	02020007040010-01	Black Ck(above/incl G.Gorge Resort trib)	Temperature	L
02	02020007040020-01	Black Creek (below G. Gorge Resort trib)	Dissolved Oxygen	M
02	02020007040040-01	Highland Lake/Wawayanda Lake	Mercury	M
02	02020007040050-01	Wawayanda Creek & tribs	Temperature	L
05	02030101170010-01	Hudson River	Mercury	M
05	02030101170010-01	Hudson River	PCB	M
05	02030101170010-01	Hudson River	DDT	M
05	02030101170010-01	Hudson River	DDD	M
05	02030101170010-01	Hudson River	DDE	M
05	02030101170010-01	Hudson River	Dioxin	M
05	02030101170010-01	Hudson River	Dieldrin	M
05	02030101170010-01	Hudson River	Benzo(a)Pyrene	M
05	02030101170010-01	Hudson River	Hexachlorobenzene	L
05	02030101170010-01	Hudson River	Chlordane	M
05	02030101170010-01	Hudson River	Cause Unknown	L
05	02030101170020-01	Sparkill Brook	Phosphorus	M
06	02030103010010-01	Passaic R Upr (above Osborn Mills)	Phosphorus	L
06	02030103010030-01	Great Brook (above Green Village Rd)	Cause Unknown	L
06	02030103010040-01	Loantaka Brook	Total Dissolved Solids	L
06	02030103010040-01	Loantaka Brook	E. Coli	L
06	02030103010050-01	Great Brook (below Green Village Rd)	Cause Unknown	L
06	02030103010060-01	Black Brook (Great Swamp NWR)	Dissolved Oxygen	M
06	02030103010060-01	Black Brook (Great Swamp NWR)	Total Dissolved Solids	L
06	02030103010070-01	Passaic R Upr (Dead R to Osborn Mills)	Arsenic	M
06	02030103010070-01	Passaic R Upr (Dead R to Osborn Mills)	Cyanide	M
06	02030103010080-01	Dead River (above Harrisons Brook)	Total Suspended Solids	L
06	02030103010090-01	Harrisons Brook	Cause Unknown	L
06	02030103010100-01	Dead River (below Harrisons Brook)	Total Suspended Solids	L
06	02030103010110-01	Passaic R Upr (Plainfield Rd to Dead R)	Dissolved Oxygen	M
06	02030103010110-01	Passaic R Upr (Plainfield Rd to Dead R)	Total Suspended Solids	L
06	02030103010110-01	Passaic R Upr (Plainfield Rd to Dead R)	Arsenic	M
06	02030103010110-01	Passaic R Upr (Plainfield Rd to Dead R)	Cyanide	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
06	02030103010120-01	Passaic R Upr (Snyder to Plainfield Rd)	Dissolved Oxygen	M
06	02030103010120-01	Passaic R Upr (Snyder to Plainfield Rd)	Total Suspended Solids	L
06	02030103010120-01	Passaic R Upr (Snyder to Plainfield Rd)	Arsenic	M
06	02030103010120-01	Passaic R Upr (Snyder to Plainfield Rd)	Cyanide	M
06	02030103010130-01	Passaic R Upr (40d 45m to Snyder Ave)	Dissolved Oxygen	M
06	02030103010130-01	Passaic R Upr (40d 45m to Snyder Ave)	Total Suspended Solids	L
06	02030103010130-01	Passaic R Upr (40d 45m to Snyder Ave)	Arsenic	M
06	02030103010130-01	Passaic R Upr (40d 45m to Snyder Ave)	Cyanide	M
06	02030103010140-01	Canoe Brook	Cause Unknown	L
06	02030103010150-01	Passaic R Upr (Columbia Rd to 40d 45m)	Dissolved Oxygen	M
06	02030103010150-01	Passaic R Upr (Columbia Rd to 40d 45m)	Total Suspended Solids	L
06	02030103010150-01	Passaic R Upr (Columbia Rd to 40d 45m)	Total Dissolved Solids	L
06	02030103010150-01	Passaic R Upr (Columbia Rd to 40d 45m)	Arsenic	M
06	02030103010150-01	Passaic R Upr (Columbia Rd to 40d 45m)	Cyanide	M
06	02030103010160-01	Passaic R Upr (HanoverRR to ColumbiaRd)	Total Suspended Solids	L
06	02030103010160-01	Passaic R Upr (HanoverRR to ColumbiaRd)	Total Dissolved Solids	L
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	Total Suspended Solids	L
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	Total Dissolved Solids	L
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	Mercury	M
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	Chlordane	M
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	PCB	M
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	DDT	M
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	DDD	M
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	DDE	M
06	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	Mercury	M
06	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	Chlordane	M
06	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	Arsenic	M
06	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	PCB	M
06	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	DDT	M
06	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	DDD	M
06	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	DDE	M
06	02030103020030-01	Greystone / Watnong Mtn tribs	Cause Unknown	L
06	02030103020040-01	Whippany R(Lk Pocahontas to Wash Val Rd)	Mercury	M
06	02030103020050-01	Whippany R (Malapardis to Lk Pocahontas)	Cause Unknown	L
06	02030103020060-01	Malapardis Brook	Cause Unknown	L
06	02030103020080-01	Troy Brook (above Reynolds Ave)	Cause Unknown	L
06	02030103020080-01	Troy Brook (above Reynolds Ave)	Mercury	M
06	02030103020090-01	Troy Brook (below Reynolds Ave)	Cause Unknown	L
06	02030103020100-01	Whippany R (Rockaway R to Malapardis Bk)	Cause Unknown	L
06	02030103020100-01	Whippany R (Rockaway R to Malapardis Bk)	Lead	M
06	02030103030030-01	Rockaway R (above Longwood Lake outlet)	Cause Unknown	L
06	02030103030030-01	Rockaway R (above Longwood Lake outlet)	Mercury	M
06	02030103030040-01	Rockaway R (Stephens Bk to Longwood Lk)	Cause Unknown	L
06	02030103030040-01	Rockaway R (Stephens Bk to Longwood Lk)	Mercury	M
06	02030103030060-01	Green Pond Brook (below Burnt Meadow Bk)	Cause Unknown	L
06	02030103030070-01	Rockaway R (74d 33m 30s to Stephens Bk)	Mercury	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
06	02030103030090-01	Rockaway R (BM 534 brdg to 74d 33m 30s)	Cause Unknown	L
06	02030103030090-01	Rockaway R (BM 534 brdg to 74d 33m 30s)	Mercury	M
06	02030103030110-01	Beaver Brook (Morris County)	pH	M
06	02030103030110-01	Beaver Brook (Morris County)	Mercury	M
06	02030103030120-01	Den Brook	pH	M
06	02030103030130-01	Stony Brook (Boonton)	Cause Unknown	L
06	02030103030140-01	Rockaway R (Stony Brook to BM 534 brdg)	Cause Unknown	L
06	02030103030140-01	Rockaway R (Stony Brook to BM 534 brdg)	Arsenic	M
06	02030103030140-01	Rockaway R (Stony Brook to BM 534 brdg)	PCE	M
06	02030103030140-01	Rockaway R (Stony Brook to BM 534 brdg)	Mercury	M
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	Arsenic	M
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	PCE	M
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	Mercury	M
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	Chlordane	M
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	PCB	M
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	DDT	M
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	DDD	M
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	DDE	M
06	02030103030160-01	Montville tribs.	Cause Unknown	L
06	02030103030170-01	Rockaway R (Passaic R to Boonton dam)	Cause Unknown	L
06	02030103030170-01	Rockaway R (Passaic R to Boonton dam)	PCE	M
06	02030103030170-01	Rockaway R (Passaic R to Boonton dam)	Mercury	M
06	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	Arsenic	M
06	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	Mercury	M
06	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	Chlordane	M
06	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	PCB	M
06	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	DDT	M
06	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	DDD	M
06	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	DDE	M
03	02030103050010-01	Pequannock R (above Stockholm/Vernon Rd)	Cause Unknown	L
03	02030103050020-01	Pacock Brook	Mercury	M
03	02030103050030-01	Pequannock R (above OakRidge Res outlet)	Cause Unknown	L
03	02030103050030-01	Pequannock R (above OakRidge Res outlet)	Mercury	M
03	02030103050040-01	Clinton Reservior/Mossmans Brook	Mercury	M
03	02030103050050-01	Pequannock R (Charlotteburg to OakRidge)	Cause Unknown	L
03	02030103050060-01	Pequannock R(Macopin gage to Charl'brg)	Mercury	M
03	02030103050060-01	Pequannock R(Macopin gage to Charl'brg)	Dissolved Oxygen	M
03	02030103050080-01	Pequannock R (below Macopin gage)	Mercury	M
03	02030103050080-01	Pequannock R (below Macopin gage)	Chlordane	M
03	02030103050080-01	Pequannock R (below Macopin gage)	PCB	M
03	02030103050080-01	Pequannock R (below Macopin gage)	DDT	M
03	02030103050080-01	Pequannock R (below Macopin gage)	DDD	M
03	02030103050080-01	Pequannock R (below Macopin gage)	DDE	M
03	02030103050080-01	Pequannock R (below Macopin gage)	Dissolved Oxygen	M
03	02030103070020-01	Belcher Creek (Pinecliff Lake & below)	Cause Unknown	L
03	02030103070030-01	Wanaque R/Greenwood Lk(aboveMonks gage)	Cause Unknown	L

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
03	02030103070030-01	Wanaque R/Greenwood Lk(aboveMonks gage)	Mercury	M
03	02030103070040-01	West Brook/Burnt Meadow Brook	Temperature	L
03	02030103070040-01	West Brook/Burnt Meadow Brook	Dissolved Oxygen	M
03	02030103070050-01	Wanaque Reservior (below Monks gage)	Dissolved Oxygen	M
03	02030103070050-01	Wanaque Reservior (below Monks gage)	Temperature	L
03	02030103070050-01	Wanaque Reservior (below Monks gage)	E. Coli	M
03	02030103070050-01	Wanaque Reservior (below Monks gage)	Mercury	M
03	02030103070060-01	Meadow Brook/High Mountain Brook	Cause Unknown	L
03	02030103070070-01	Wanaque R/Posts Bk (below reservior)	Unknown Toxic	L
03	02030103100010-01	Ramapo R (above 74d 11m 00s)	Cause Unknown	L
03	02030103100050-01	Ramapo R (Crystal Lk br to BearSwamp Bk)	Cause Unknown	L
03	02030103100060-01	Crystal Lake/Pond Brook	Mercury	M
03	02030103100070-01	Ramapo R (below Crystal Lake bridge)	Dissolved Oxygen	M
03	02030103100070-01	Ramapo R (below Crystal Lake bridge)	pH	M
03	02030103100070-01	Ramapo R (below Crystal Lake bridge)	Mercury	M
03	02030103100070-01	Ramapo R (below Crystal Lake bridge)	Chlordane	M
03	02030103100070-01	Ramapo R (below Crystal Lake bridge)	PCB	M
03	02030103100070-01	Ramapo R (below Crystal Lake bridge)	DDT	M
03	02030103100070-01	Ramapo R (below Crystal Lake bridge)	DDD	M
03	02030103100070-01	Ramapo R (below Crystal Lake bridge)	DDE	M
03	02030103110010-01	Lincoln Park tribs (Pompton River)	Cause Unknown	L
03	02030103110020-01	Pompton River	E. Coli	M
03	02030103110020-01	Pompton River	Chromium	M
03	02030103110020-01	Pompton River	Lead	M
03	02030103110020-01	Pompton River	Unknown Toxic	L
03	02030103110020-01	Pompton River	Mercury	M
03	02030103110020-01	Pompton River	Chlordane	M
03	02030103110020-01	Pompton River	PCB	M
03	02030103110020-01	Pompton River	DDT	M
03	02030103110020-01	Pompton River	DDD	M
03	02030103110020-01	Pompton River	DDE	M
04	02030103120010-01	Peckman River (above CG Res trib)	Cause Unknown	L
04	02030103120020-01	Peckman River (below CG Res trib)	pH	M
04	02030103120020-01	Peckman River (below CG Res trib)	PCB	M
04	02030103120020-01	Peckman River (below CG Res trib)	Phosphorus	M
04	02030103120030-01	Preakness Brook / Naachtpunkt Brook	Cause Unknown	L
04	02030103120040-01	Molly Ann Brook	Total Dissolved Solids	L
04	02030103120050-01	Goffle Brook	Total Dissolved Solids	L
04	02030103120060-01	Deepavaal Brook	Cause Unknown	L
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Unionized Ammonia	M
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Arsenic	M
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Cyanide	M
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Mercury	M
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Chlordane	M
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	PCB	M
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	DDT	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	DDD	M
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	DDE	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Unionized Ammonia	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Arsenic	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Cyanide	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Mercury	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Chlordane	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	PCB	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	DDT	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	DDD	M
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	DDE	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Phosphorus	L
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Unionized Ammonia	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Arsenic	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Cyanide	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Mercury	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Chlordane	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	PCB	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	DDT	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	DDD	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	DDE	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Dioxin	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Heptachlor epoxide	M
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Benzo(a)Pyrene	L
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Dieldrin	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Unionized Ammonia	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Arsenic	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Chromium	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Thallium	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Cyanide	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Mercury	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Chlordane	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	PCB	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	DDT	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	DDD	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	DDE	M
04	02030103140010-01	Hohokus Bk (above Godwin Ave)	Phosphorus	H
04	02030103140010-01	Hohokus Bk (above Godwin Ave)	Total Dissolved Solids	L
04	02030103140010-01	Hohokus Bk (above Godwin Ave)	Unknown Toxic	L
04	02030103140020-01	Hohokus Bk(Pennington Ave to Godwin Ave)	Total Dissolved Solids	L
04	02030103140020-01	Hohokus Bk(Pennington Ave to Godwin Ave)	Unknown Toxic	L
04	02030103140030-01	Hohokus Bk(below Pennington Ave)	Unknown Toxic	L
04	02030103140040-01	Saddle River (above Rt 17)	Temperature	L
04	02030103140040-01	Saddle River (above Rt 17)	Unknown Toxic	L
04	02030103140050-01	Saddle River (Rt 4 to Rt 17)	Phosphorus	M
04	02030103140050-01	Saddle River (Rt 4 to Rt 17)	Total Suspended Solids	L

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
04	02030103140050-01	Saddle River (Rt 4 to Rt 17)	Arsenic	M
04	02030103140050-01	Saddle River (Rt 4 to Rt 17)	Unknown Toxic	L
04	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Phosphorus	M
04	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Nitrate	M
04	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Total Suspended Solids	L
04	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Total Dissolved Solids	L
04	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Unionized Ammonia	H
04	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Arsenic	M
04	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Unknown Toxic	L
04	02030103140070-01	Saddle River (below Lodi gage)	Phosphorus	M
04	02030103140070-01	Saddle River (below Lodi gage)	Nitrate	M
04	02030103140070-01	Saddle River (below Lodi gage)	Total Suspended Solids	L
04	02030103140070-01	Saddle River (below Lodi gage)	Total Dissolved Solids	L
04	02030103140070-01	Saddle River (below Lodi gage)	Unionized Ammonia	H
04	02030103140070-01	Saddle River (below Lodi gage)	Arsenic	M
04	02030103140070-01	Saddle River (below Lodi gage)	Unknown Toxic	L
04	02030103140070-01	Saddle River (below Lodi gage)	PCB	M
04	02030103140070-01	Saddle River (below Lodi gage)	Dioxin	M
04	02030103150010-01	Third River	Cause Unknown	L
04	02030103150010-01	Third River	PCB	M
04	02030103150010-01	Third River	Dioxin	M
04	02030103150020-01	Second River	pH	M
04	02030103150020-01	Second River	Phosphorus	M
04	02030103150020-01	Second River	Unionized Ammonia	M
04	02030103150020-01	Second River	E. Coli	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Unionized Ammonia	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Arsenic	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Enterococci	H
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Mercury	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	PCB	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	DDT	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	DDD	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	DDE	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Dioxin	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Dieldrin	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Benzo(a)Pyrene	L
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Chlordane	M
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Heptachlor epoxide	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Unionized Ammonia	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Arsenic	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Mercury	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	PCB	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	DDT	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	DDD	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	DDE	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Dioxin	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Dieldrin	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Benzo(a)Pyrene	L
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Chlordane	M
04	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Heptachlor epoxide	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Dissolved Oxygen	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Unionized Ammonia	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Arsenic	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Mercury	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	PCB	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	DDT	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	DDD	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	DDE	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Dioxin	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Dieldrin	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Benzo(a)Pyrene	L
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Chlordane	M
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Heptachlor epoxide	M
05	02030103170010-01	Pascack Brook (above Westwood gage)	Total Dissolved Solids	L
05	02030103170020-01	Pascack Brook (below Westwood gage)	Total Dissolved Solids	L
05	02030103170020-01	Pascack Brook (below Westwood gage)	Arsenic	M
05	02030103170030-01	Hackensack River (above Old Tappan gage)	Phosphorus	M
05	02030103170030-01	Hackensack River (above Old Tappan gage)	Arsenic	M
05	02030103170030-01	Hackensack River (above Old Tappan gage)	Mercury	M
05	02030103170040-01	Tenakill Brook	Cause Unknown	L
05	02030103170040-01	Tenakill Brook	Arsenic	M
05	02030103170050-01	Dwars Kill	E. Coli	M
05	02030103170060-01	Hackensack R (Oradell to OldTappan gage)	Dissolved Oxygen	M
05	02030103170060-01	Hackensack R (Oradell to OldTappan gage)	Phosphorus	M
05	02030103170060-01	Hackensack R (Oradell to OldTappan gage)	E. Coli	M
05	02030103170060-01	Hackensack R (Oradell to OldTappan gage)	Arsenic	M
05	02030103170060-01	Hackensack R (Oradell to OldTappan gage)	Mercury	M
05	02030103180010-01	Coles Brook / Van Saun Mill Brook	Total Dissolved Solids	L
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Turbidity	L
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	E. Coli	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Copper	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Enterococci	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Mercury	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	PCB	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	DDT	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	DDD	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	DDE	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Dioxin	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Dieldrin	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Benzo(a)Pyrene	L
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Chlordane	M
05	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Heptachlor epoxide	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
05	02030103180040-01	Overpeck Creek	pH	M
05	02030103180040-01	Overpeck Creek	Total Dissolved Solids	L
05	02030103180040-01	Overpeck Creek	Unionized Ammonia	M
05	02030103180040-01	Overpeck Creek	Chloride	M
05	02030103180040-01	Overpeck Creek	E. Coli	H
05	02030103180040-01	Overpeck Creek	Cadmium	M
05	02030103180040-01	Overpeck Creek	Lead	M
05	02030103180040-01	Overpeck Creek	Mercury	M
05	02030103180040-01	Overpeck Creek	Chlordane	M
05	02030103180040-01	Overpeck Creek	PCB	M
05	02030103180040-01	Overpeck Creek	DDT	M
05	02030103180040-01	Overpeck Creek	DDD	M
05	02030103180040-01	Overpeck Creek	DDE	M
05	02030103180040-01	Overpeck Creek	Dioxin	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Dissolved Oxygen	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Unionized Ammonia	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Turbidity	L
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Mercury	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	PCB	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	DDT	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	DDD	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	DDE	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Dioxin	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Dieldrin	M
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Benzo(a)Pyrene	L
05	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Chlordane	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Dissolved Oxygen	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Unionized Ammonia	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Turbidity	L
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Arsenic	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Cadmium	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Copper	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Lead	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Mercury	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	PCB	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	DDT	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	DDD	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	DDE	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Dioxin	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Dieldrin	M
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Benzo(a)Pyrene	L
05	02030103180060-01	Berrys Creek (above Paterson Ave)	Chlordane	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Dissolved Oxygen	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Unionized Ammonia	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Turbidity	L
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Arsenic	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Cadmium	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Chromium	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Copper	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Lead	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	PCB	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Chlorinated Benzenes	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Mercury	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	DDT	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	DDD	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	DDE	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Dioxin	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Dieldrin	M
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Benzo(a)Pyrene	L
05	02030103180070-01	Berrys Creek (below Paterson Ave)	Chlordane	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Dissolved Oxygen	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Unionized Ammonia	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Turbidity	L
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Cadmium	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Mercury	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	PCB	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	DDT	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	DDD	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	DDE	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Dioxin	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Dieldrin	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Benzo(a)Pyrene	L
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Chlordane	M
05	02030103180080-01	Hackensack R (Rt 3 to Bellmans Ck)	Heptachlor epoxide	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Dissolved Oxygen	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Unionized Ammonia	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Cadmium	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Mercury	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	PCB	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	DDT	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	DDD	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	DDE	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Dioxin	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Dieldrin	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Benzo(a)Pyrene	L
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Chlordane	M
05	02030103180090-01	Hackensack R (Amtrak bridge to Rt 3)	Heptachlor epoxide	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Dissolved Oxygen	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	pH	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Unionized Ammonia	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Turbidity	L
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Cadmium	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Mercury	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	PCB	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	DDT	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	DDD	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	DDE	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Dioxin	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Benzo(a)Pyrene	L
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Dieldrin	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Chlordane	M
05	02030103180100-01	Hackensack R (below Amtrak bridge)	Heptachlor epoxide	M
07	02030104010010-01	Newark Airport Peripheral Ditch	Phosphorus	M
07	02030104010010-01	Newark Airport Peripheral Ditch	Mercury	M
07	02030104010010-01	Newark Airport Peripheral Ditch	PCB	M
07	02030104010010-01	Newark Airport Peripheral Ditch	DDT	M
07	02030104010010-01	Newark Airport Peripheral Ditch	DDD	M
07	02030104010010-01	Newark Airport Peripheral Ditch	DDE	M
07	02030104010010-01	Newark Airport Peripheral Ditch	Dioxin	M
07	02030104010010-01	Newark Airport Peripheral Ditch	Benzo(a)Pyrene	L
07	02030104010010-01	Newark Airport Peripheral Ditch	Dieldrin	M
07	02030104010010-01	Newark Airport Peripheral Ditch	Chlordane	M
07	02030104010020-01	Kill Van Kull West	Mercury	M
07	02030104010020-01	Kill Van Kull West	PCB	M
07	02030104010020-01	Kill Van Kull West	DDT	M
07	02030104010020-01	Kill Van Kull West	DDD	M
07	02030104010020-01	Kill Van Kull West	DDE	M
07	02030104010020-01	Kill Van Kull West	Dioxin	M
07	02030104010020-01	Kill Van Kull West	Hexachlorobenzene	M
07	02030104010020-01	Kill Van Kull West	Benzo(a)Pyrene	M
07	02030104010020-01	Kill Van Kull West	Dieldrin	M
07	02030104010020-01	Kill Van Kull West	Chlordane	M
07	02030104010020-01	Kill Van Kull West	Heptachlor epoxide	M
07	02030104010020-01	Kill Van Kull West	Cause Unknown	L
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	Mercury	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	PCB	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	DDT	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	DDD	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	DDE	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	Dioxin	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	Dieldrin	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	Benzo(a)Pyrene	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	Heptachlor epoxide	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	Chlordane	M
07	02030104010020-02	Newark Bay / Kill Van Kull (74d 07m 30s)	Cause Unknown	L
07	02030104010030-01	Kill Van Kull East	Mercury	M
07	02030104010030-01	Kill Van Kull East	PCB	M
07	02030104010030-01	Kill Van Kull East	DDT	M

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07	02030104010030-01	Kill Van Kull East	DDD	M
07	02030104010030-01	Kill Van Kull East	DDE	M
07	02030104010030-01	Kill Van Kull East	Dioxin	M
07	02030104010030-01	Kill Van Kull East	Dieldrin	M
07	02030104010030-01	Kill Van Kull East	Benzo(a)Pyrene	M
07	02030104010030-01	Kill Van Kull East	Hexachlorobenzene	M
07	02030104010030-01	Kill Van Kull East	Chlordane	M
07	02030104010030-01	Kill Van Kull East	Heptachlor epoxide	M
07	02030104010030-01	Kill Van Kull East	Cause Unknown	L
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	Mercury	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	PCB	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	DDT	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	DDD	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	DDE	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	Dioxin	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	Dieldrin	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	Benzo(a)Pyrene	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	Hexachlorobenzene	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	Chlordane	M
07	02030104010030-02	Upper NY Bay / Kill Van Kull (74d07m30s)	Cause Unknown	L
07	02030104020020-01	Elizabeth R (Elizabeth CORP BDY to I-78)	Phosphorus	M
07	02030104020020-01	Elizabeth R (Elizabeth CORP BDY to I-78)	Total Dissolved Solids	L
07	02030104020020-01	Elizabeth R (Elizabeth CORP BDY to I-78)	Copper	M
07	02030104020020-01	Elizabeth R (Elizabeth CORP BDY to I-78)	Lead	M
07	02030104020030-01	Arthur Kill North	Mercury	M
07	02030104020030-01	Arthur Kill North	PCB	M
07	02030104020030-01	Arthur Kill North	DDT	M
07	02030104020030-01	Arthur Kill North	DDD	M
07	02030104020030-01	Arthur Kill North	DDE	M
07	02030104020030-01	Arthur Kill North	Dioxin	M
07	02030104020030-01	Arthur Kill North	Dieldrin	M
07	02030104020030-01	Arthur Kill North	Benzo(a)Pyrene	M
07	02030104020030-01	Arthur Kill North	Hexachlorobenzene	M
07	02030104020030-01	Arthur Kill North	Chlordane	M
07	02030104020030-01	Arthur Kill North	Heptachlor epoxide	M
07	02030104020030-01	Arthur Kill North	Cause Unknown	L
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Dissolved Oxygen	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Phosphorus	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Total Dissolved Solids	L
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Copper	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Lead	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Mercury	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	PCB	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	DDT	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	DDD	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	DDE	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Dioxin	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Dieldrin	M
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Benzo(a)Pyrene	L
07	02030104020030-02	Elizabeth R (below Elizabeth CORP BDY)	Chlordane	M
07	02030104030010-01	Arthur Kill South	Mercury	M
07	02030104030010-01	Arthur Kill South	PCB	M
07	02030104030010-01	Arthur Kill South	DDT	M
07	02030104030010-01	Arthur Kill South	DDD	M
07	02030104030010-01	Arthur Kill South	DDE	M
07	02030104030010-01	Arthur Kill South	Dioxin	M
07	02030104030010-01	Arthur Kill South	Dieldrin	M
07	02030104030010-01	Arthur Kill South	Benzo(a)Pyrene	M
07	02030104030010-01	Arthur Kill South	Hexachlorobenzene	M
07	02030104030010-01	Arthur Kill South	Chlordane	M
07	02030104030010-01	Arthur Kill South	Heptachlor epoxide	M
07	02030104030010-01	Arthur Kill South	Cause Unknown	L
07	02030104030010-02	Morses Creek / Piles Creek	Phosphorus	M
07	02030104030010-02	Morses Creek / Piles Creek	Total Dissolved Solids	L
07	02030104030010-02	Morses Creek / Piles Creek	Mercury	M
07	02030104030010-02	Morses Creek / Piles Creek	PCB	M
07	02030104030010-02	Morses Creek / Piles Creek	DDT	M
07	02030104030010-02	Morses Creek / Piles Creek	DDD	M
07	02030104030010-02	Morses Creek / Piles Creek	DDE	M
07	02030104030010-02	Morses Creek / Piles Creek	Dioxin	M
07	02030104030010-02	Morses Creek / Piles Creek	Dieldrin	M
07	02030104030010-02	Morses Creek / Piles Creek	Benzo(a)Pyrene	L
07	02030104030010-02	Morses Creek / Piles Creek	Chlordane	M
07	02030104050010-01	Rahway River WB	Phosphorus	M
07	02030104050010-01	Rahway River WB	Total Dissolved Solids	L
07	02030104050010-01	Rahway River WB	Sulfate	M
07	02030104050020-01	Rahway River EB	Total Dissolved Solids	L
07	02030104050040-01	Rahway R (Kenilworth Blvd to EB / WB)	Phosphorus	M
07	02030104050040-01	Rahway R (Kenilworth Blvd to EB / WB)	Total Dissolved Solids	L
07	02030104050040-01	Rahway R (Kenilworth Blvd to EB / WB)	Arsenic	M
07	02030104050060-01	Rahway R(Robinsons Br to KenilworthBlvd)	Phosphorus	M
07	02030104050060-01	Rahway R(Robinsons Br to KenilworthBlvd)	Total Suspended Solids	L
07	02030104050060-01	Rahway R(Robinsons Br to KenilworthBlvd)	Arsenic	M
07	02030104050060-01	Rahway R(Robinsons Br to KenilworthBlvd)	Mercury	M
07	02030104050070-01	Robinsons Br Rahway R (above Lake Ave)	Phosphorus	M
07	02030104050080-01	Robinsons Br Rahway R (below Lake Ave)	Phosphorus	M
07	02030104050080-01	Robinsons Br Rahway R (below Lake Ave)	Arsenic	M
07	02030104050090-01	Rahway River SB	Phosphorus	M
07	02030104050090-01	Rahway River SB	Total Dissolved Solids	L
07	02030104050090-01	Rahway River SB	PCB	M
07	02030104050090-01	Rahway River SB	Dioxin	M
07	02030104050100-01	Rahway River (below Robinsons Branch)	Mercury	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
07	02030104050100-01	Rahway River (below Robinsons Branch)	PCB	M
07	02030104050100-01	Rahway River (below Robinsons Branch)	DDT	M
07	02030104050100-01	Rahway River (below Robinsons Branch)	DDD	M
07	02030104050100-01	Rahway River (below Robinsons Branch)	DDE	M
07	02030104050100-01	Rahway River (below Robinsons Branch)	Dioxin	M
07	02030104050100-01	Rahway River (below Robinsons Branch)	Dieldrin	M
07	02030104050100-01	Rahway River (below Robinsons Branch)	Benzo(a)Pyrene	L
07	02030104050100-01	Rahway River (below Robinsons Branch)	Chlordane	M
07	02030104050110-01	Woodbridge Creek	PCB	M
07	02030104050110-01	Woodbridge Creek	Dioxin	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Mercury	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	PCB	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	DDT	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	DDD	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	DDE	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Dioxin	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Dieldrin	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Benzo(a)Pyrene	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Hexachlorobenzene	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Chlordane	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Heptachlor epoxide	M
07	02030104050120-01	Arthur Kill waterfront (below Grasselli)	Cause Unknown	L
12	02030104060010-01	Cheesequake Creek / Whale Creek	Mercury	M
12	02030104060010-01	Cheesequake Creek / Whale Creek	Chlordane	M
12	02030104060010-01	Cheesequake Creek / Whale Creek	PCB	M
12	02030104060010-01	Cheesequake Creek / Whale Creek	DDT	M
12	02030104060010-01	Cheesequake Creek / Whale Creek	DDD	M
12	02030104060010-01	Cheesequake Creek / Whale Creek	DDE	M
12	02030104060020-01	Matawan Creek (above Ravine Drive)	Arsenic	M
12	02030104060020-01	Matawan Creek (above Ravine Drive)	Copper	M
12	02030104060020-01	Matawan Creek (above Ravine Drive)	Lead	M
12	02030104060020-01	Matawan Creek (above Ravine Drive)	PCB	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	pH	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	Phosphorus	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	Enterococci	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	Mercury	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	Chlordane	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	PCB	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	DDT	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	DDD	M
12	02030104060030-01	Matawan Creek (below Ravine Drive)	DDE	M
12	02030104060040-01	Chingarora Creek to Thorns Creek	Cause Unknown	L
12	02030104060040-01	Chingarora Creek to Thorns Creek	Enterococci	M
12	02030104060040-01	Chingarora Creek to Thorns Creek	Mercury	M
12	02030104060040-01	Chingarora Creek to Thorns Creek	Chlordane	M
12	02030104060040-01	Chingarora Creek to Thorns Creek	PCB	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
12	02030104060040-01	Chingarora Creek to Thorns Creek	DDT	M
12	02030104060040-01	Chingarora Creek to Thorns Creek	DDD	M
12	02030104060040-01	Chingarora Creek to Thorns Creek	DDE	M
12	02030104060050-01	Waackaack Creek	Dissolved Oxygen	M
12	02030104060050-01	Waackaack Creek	Arsenic	M
12	02030104060050-01	Waackaack Creek	Enterococci	M
12	02030104060050-01	Waackaack Creek	Mercury	M
12	02030104060050-01	Waackaack Creek	Chlordane	M
12	02030104060050-01	Waackaack Creek	PCB	M
12	02030104060050-01	Waackaack Creek	DDT	M
12	02030104060050-01	Waackaack Creek	DDD	M
12	02030104060050-01	Waackaack Creek	DDE	M
12	02030104060060-01	Pews Creek to Shrewsbury River	Cause Unknown	L
12	02030104060060-01	Pews Creek to Shrewsbury River	Mercury	M
12	02030104060060-01	Pews Creek to Shrewsbury River	Chlordane	M
12	02030104060060-01	Pews Creek to Shrewsbury River	PCB	M
12	02030104060060-01	Pews Creek to Shrewsbury River	DDT	M
12	02030104060060-01	Pews Creek to Shrewsbury River	DDD	M
12	02030104060060-01	Pews Creek to Shrewsbury River	DDE	M
12	02030104070010-01	Hop Brook	Temperature	L
12	02030104070010-01	Hop Brook	Phosphorus	M
12	02030104070010-01	Hop Brook	Total Suspended Solids	L
12	02030104070010-01	Hop Brook	Arsenic	M
12	02030104070020-01	Willow Brook	pH	M
12	02030104070020-01	Willow Brook	Phosphorus	M
12	02030104070020-01	Willow Brook	Total Suspended Solids	L
12	02030104070030-01	Big Brook	Phosphorus	M
12	02030104070040-01	Yellow Brook (above Bucks Mill)	Cause Unknown	L
12	02030104070050-01	Mine Brook (Monmouth Co)	Cause Unknown	L
12	02030104070060-01	Yellow Brook (below Bucks Mill)	Cause Unknown	L
12	02030104070070-01	Swimming River Reservior / Slope Bk	Phosphorus	M
12	02030104070070-01	Swimming River Reservior / Slope Bk	Total Suspended Solids	L
12	02030104070080-01	Pine Brook / Hockhockson Brook	Cause Unknown	L
12	02030104070090-01	Nut Swamp Brook	Cause Unknown	L
12	02030104070090-01	Nut Swamp Brook	Mercury	M
12	02030104070100-01	Poricy Bk/Swimming R(below SwimmingR Rd)	Dissolved Oxygen	M
12	02030104070100-01	Poricy Bk/Swimming R(below SwimmingR Rd)	PCB	M
12	02030104070100-01	Poricy Bk/Swimming R(below SwimmingR Rd)	DDT	M
12	02030104070100-01	Poricy Bk/Swimming R(below SwimmingR Rd)	DDD	M
12	02030104070100-01	Poricy Bk/Swimming R(below SwimmingR Rd)	DDE	M
12	02030104070110-01	Navesink R (below Rt 35)/LowerShrewsbury	Dissolved Oxygen	M
12	02030104070110-01	Navesink R (below Rt 35)/LowerShrewsbury	Turbidity	L
12	02030104070110-01	Navesink R (below Rt 35)/LowerShrewsbury	Mercury	M
12	02030104070110-01	Navesink R (below Rt 35)/LowerShrewsbury	PCB	M
12	02030104070110-01	Navesink R (below Rt 35)/LowerShrewsbury	DDT	M
12	02030104070110-01	Navesink R (below Rt 35)/LowerShrewsbury	DDD	M

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12	02030104070110-01	Navesink R (below Rt 35)/LowerShrewsbury	DDE	M
12	02030104080010-01	Little Silver Creek / Town Neck Creek	Mercury	M
12	02030104080010-01	Little Silver Creek / Town Neck Creek	PCB	M
12	02030104080010-01	Little Silver Creek / Town Neck Creek	DDT	M
12	02030104080010-01	Little Silver Creek / Town Neck Creek	DDD	M
12	02030104080010-01	Little Silver Creek / Town Neck Creek	DDE	M
12	02030104080020-01	Parkers Creek / Oceanport Creek	Dissolved Oxygen	M
12	02030104080020-01	Parkers Creek / Oceanport Creek	pH	M
12	02030104080020-01	Parkers Creek / Oceanport Creek	Phosphorus	M
12	02030104080020-01	Parkers Creek / Oceanport Creek	Mercury	M
12	02030104080020-01	Parkers Creek / Oceanport Creek	PCB	M
12	02030104080020-01	Parkers Creek / Oceanport Creek	DDT	M
12	02030104080020-01	Parkers Creek / Oceanport Creek	DDD	M
12	02030104080020-01	Parkers Creek / Oceanport Creek	DDE	M
12	02030104080030-01	Branchport Creek	Dissolved Oxygen	M
12	02030104080030-01	Branchport Creek	E. Coli	M
12	02030104080030-01	Branchport Creek	Enterococci	M
12	02030104080030-01	Branchport Creek	Mercury	M
12	02030104080030-01	Branchport Creek	PCB	M
12	02030104080030-01	Branchport Creek	DDT	M
12	02030104080030-01	Branchport Creek	DDD	M
12	02030104080030-01	Branchport Creek	DDE	M
12	02030104080040-01	Shrewsbury River (above Navesink River)	Dissolved Oxygen	M
12	02030104080040-01	Shrewsbury River (above Navesink River)	pH	M
12	02030104080040-01	Shrewsbury River (above Navesink River)	Mercury	M
12	02030104080040-01	Shrewsbury River (above Navesink River)	PCB	M
12	02030104080040-01	Shrewsbury River (above Navesink River)	DDT	M
12	02030104080040-01	Shrewsbury River (above Navesink River)	DDD	M
12	02030104080040-01	Shrewsbury River (above Navesink River)	DDE	M
12	02030104090010-01	Whale Pond Brook	Cause Unknown	L
12	02030104090020-01	Poplar Brook	Phosphorus	M
12	02030104090030-01	Deal Lake	pH	M
12	02030104090040-01	Shark River (above Remsen Mill gage)	Cause Unknown	L
12	02030104090040-01	Shark River (above Remsen Mill gage)	Mercury	M
12	02030104090040-01	Shark River (above Remsen Mill gage)	Chlordane	M
12	02030104090040-01	Shark River (above Remsen Mill gage)	PCB	M
12	02030104090040-01	Shark River (above Remsen Mill gage)	DDT	M
12	02030104090040-01	Shark River (above Remsen Mill gage)	DDD	M
12	02030104090040-01	Shark River (above Remsen Mill gage)	DDE	M
12	02030104090050-01	Jumping Brook (Ocean Co)	pH	M
12	02030104090060-01	Shark River (below Remsen Mill gage)	Dissolved Oxygen	M
12	02030104090060-01	Shark River (below Remsen Mill gage)	Enterococci	M
12	02030104090060-01	Shark River (below Remsen Mill gage)	Mercury	M
12	02030104090060-01	Shark River (below Remsen Mill gage)	Chlordane	M
12	02030104090060-01	Shark River (below Remsen Mill gage)	PCB	M
12	02030104090060-01	Shark River (below Remsen Mill gage)	DDT	M

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12	02030104090060-01	Shark River (below Remsen Mill gage)	DDD	M
12	02030104090060-01	Shark River (below Remsen Mill gage)	DDE	M
12	02030104090070-01	Wreck Pond Brook (above Rt 35)	pH	M
12	02030104090080-01	Wreck Pond Brook (below Rt 35)	Phosphorus	M
12	02030104090080-01	Wreck Pond Brook (below Rt 35)	Mercury	M
12	02030104100010-01	Manasquan R (above 74d17m50s road)	Cause Unknown	L
12	02030104100020-01	Manasquan R (Rt 9 to 74d17m50s road)	Total Suspended Solids	L
12	02030104100030-01	Manasquan R (West Farms Rd to Rt 9)	Temperature	L
12	02030104100030-01	Manasquan R (West Farms Rd to Rt 9)	Total Suspended Solids	L
12	02030104100040-01	Marsh Bog Brook	Cause Unknown	L
12	02030104100050-01	Manasquan R (gage to West Farms Rd)	Temperature	L
12	02030104100050-01	Manasquan R (gage to West Farms Rd)	Total Suspended Solids	L
12	02030104100050-01	Manasquan R (gage to West Farms Rd)	Mercury	M
12	02030104100060-01	Mingamahone Brook (above Asbury Rd)	Total Suspended Solids	L
12	02030104100060-01	Mingamahone Brook (above Asbury Rd)	Turbidity	L
12	02030104100080-01	Manasquan R (74d07m30s to Squankum gage)	Arsenic	M
12	02030104100090-01	Manasquan R (Rt 70 br to 74d07m30s)	Cause Unknown	L
12	02030104100100-01	Manasquan River (below Rt 70 bridge)	Dissolved Oxygen	M
12	02030104100100-01	Manasquan River (below Rt 70 bridge)	Enterococci	L
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Dissolved Oxygen	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Enterococci	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Total Coliform	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Mercury	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Chlordane	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	PCB	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	DDT	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	DDD	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	DDE	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Dioxin	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Dieldrin	M
12	02030104910010-01	Raritan Bay (west of Thorns Ck)	Benzo(a)Pyrene	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	Dissolved Oxygen	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	Total Coliform	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	Mercury	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	Chlordane	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	PCB	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	DDT	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	DDD	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	DDE	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	Dieldrin	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	Benzo(a)Pyrene	M
12	02030104910020-01	Sandy Hook Bay (east of Thorns Ck)	Dioxin	M
12	02030104920010-01	Atl Coast(Sandy H to Navesink R)Inshore	Dissolved Oxygen	M
12	02030104920010-01	Atl Coast(Sandy H to Navesink R)Inshore	Mercury	M
12	02030104920010-01	Atl Coast(Sandy H to Navesink R)Inshore	PCB	M
12	02030104920010-01	Atl Coast(Sandy H to Navesink R)Inshore	DDT	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
12	02030104920010-01	Atl Coast(Sandy H to Navesink R)Inshore	DDD	M
12	02030104920010-01	Atl Coast(Sandy H to Navesink R)Inshore	DDE	M
12	02030104920010-02	Atl Coast(Sandy H to Navesink R)offshore	Dissolved Oxygen	M
12	02030104920010-02	Atl Coast(Sandy H to Navesink R)offshore	Mercury	M
12	02030104920010-02	Atl Coast(Sandy H to Navesink R)offshore	PCB	M
12	02030104920010-02	Atl Coast(Sandy H to Navesink R)offshore	DDT	M
12	02030104920010-02	Atl Coast(Sandy H to Navesink R)offshore	DDD	M
12	02030104920010-02	Atl Coast(Sandy H to Navesink R)offshore	DDE	M
12	02030104920020-01	AtlCoast(Navesink R to WhalePond)inshore	Dissolved Oxygen	M
12	02030104920020-01	AtlCoast(Navesink R to WhalePond)inshore	Mercury	M
12	02030104920020-01	AtlCoast(Navesink R to WhalePond)inshore	PCB	M
12	02030104920020-01	AtlCoast(Navesink R to WhalePond)inshore	DDT	M
12	02030104920020-01	AtlCoast(Navesink R to WhalePond)inshore	DDD	M
12	02030104920020-01	AtlCoast(Navesink R to WhalePond)inshore	DDE	M
12	02030104920020-02	AtlCoast(Navesink R to WhalePond)offshor	Dissolved Oxygen	M
12	02030104920020-02	AtlCoast(Navesink R to WhalePond)offshor	Mercury	M
12	02030104920020-02	AtlCoast(Navesink R to WhalePond)offshor	PCB	M
12	02030104920020-02	AtlCoast(Navesink R to WhalePond)offshor	DDT	M
12	02030104920020-02	AtlCoast(Navesink R to WhalePond)offshor	DDD	M
12	02030104920020-02	AtlCoast(Navesink R to WhalePond)offshor	DDE	M
12	02030104930010-01	Atl Coast(Whale Pond to Shark R)inshore	Dissolved Oxygen	M
12	02030104930010-01	Atl Coast(Whale Pond to Shark R)inshore	Mercury	M
12	02030104930010-01	Atl Coast(Whale Pond to Shark R)inshore	PCB	M
12	02030104930010-01	Atl Coast(Whale Pond to Shark R)inshore	DDT	M
12	02030104930010-01	Atl Coast(Whale Pond to Shark R)inshore	DDD	M
12	02030104930010-01	Atl Coast(Whale Pond to Shark R)inshore	DDE	M
12	02030104930010-02	Atl Coast(Whale Pond to Shark R)offshore	Dissolved Oxygen	M
12	02030104930010-02	Atl Coast(Whale Pond to Shark R)offshore	Mercury	M
12	02030104930010-02	Atl Coast(Whale Pond to Shark R)offshore	PCB	M
12	02030104930010-02	Atl Coast(Whale Pond to Shark R)offshore	DDT	M
12	02030104930010-02	Atl Coast(Whale Pond to Shark R)offshore	DDD	M
12	02030104930010-02	Atl Coast(Whale Pond to Shark R)offshore	DDE	M
12	02030104930020-01	Atl Coast (Shark R to Manasquan)inshore	Dissolved Oxygen	M
12	02030104930020-01	Atl Coast (Shark R to Manasquan)inshore	Enterococci	M
12	02030104930020-01	Atl Coast (Shark R to Manasquan)inshore	Mercury	M
12	02030104930020-01	Atl Coast (Shark R to Manasquan)inshore	PCB	M
12	02030104930020-01	Atl Coast (Shark R to Manasquan)inshore	DDT	M
12	02030104930020-01	Atl Coast (Shark R to Manasquan)inshore	DDD	M
12	02030104930020-01	Atl Coast (Shark R to Manasquan)inshore	DDE	M
12	02030104930020-02	Atl Coast (Shark R to Manasquan)offshore	Dissolved Oxygen	M
12	02030104930020-02	Atl Coast (Shark R to Manasquan)offshore	Mercury	M
12	02030104930020-02	Atl Coast (Shark R to Manasquan)offshore	PCB	M
12	02030104930020-02	Atl Coast (Shark R to Manasquan)offshore	DDT	M
12	02030104930020-02	Atl Coast (Shark R to Manasquan)offshore	DDD	M
12	02030104930020-02	Atl Coast (Shark R to Manasquan)offshore	DDE	M
08	02030105010020-01	Drakes Brook (below Eyland Ave)	Cause Unknown	L

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
08	02030105010030-01	Raritan River SB(above Rt 46)	Mercury	M
08	02030105010050-01	Raritan R SB(LongValley br to 74d44m15s)	Temperature	L
08	02030105010050-01	Raritan R SB(LongValley br to 74d44m15s)	Cause Unknown	M
08	02030105010060-01	Raritan R SB(Califon br to Long Valley)	Temperature	L
08	02030105010070-01	Raritan R SB(StoneMill gage to Califon)	Temperature	L
08	02030105010080-01	Raritan R SB(Spruce Run-StoneMill gage)	Temperature	L
08	02030105020010-01	Spruce Run (above Glen Gardner)	Temperature	L
08	02030105020020-01	Spruce Run (Reservior to Glen Gardner)	Temperature	L
08	02030105020030-01	Mulhockaway Creek	Temperature	M
08	02030105020040-01	Spruce Run Reservior / Willoughby Brook	pH	L
08	02030105020040-01	Spruce Run Reservior / Willoughby Brook	Temperature	H
08	02030105020040-01	Spruce Run Reservior / Willoughby Brook	Phosphorus	M
08	02030105020040-01	Spruce Run Reservior / Willoughby Brook	Mercury	M
08	02030105020050-01	Beaver Brook (Clinton)	Phosphorus	H
08	02030105020060-01	Cakepoulin Creek	DDT	M
08	02030105020060-01	Cakepoulin Creek	DDE	M
08	02030105020060-01	Cakepoulin Creek	DDD	M
08	02030105020080-01	Raritan R SB(Prescott Bk to River Rd)	Temperature	L
08	02030105020080-01	Raritan R SB(Prescott Bk to River Rd)	Arsenic	M
08	02030105020080-01	Raritan R SB(Prescott Bk to River Rd)	Cause Unknown	M
08	02030105020090-01	Prescott Brook / Round Valley Reservior	Mercury	M
08	02030105020100-01	Raritan R SB(Three Bridges-Prescott Bk)	Cause Unknown	L
08	02030105020100-01	Raritan R SB(Three Bridges-Prescott Bk)	Temperature	L
08	02030105020100-01	Raritan R SB(Three Bridges-Prescott Bk)	Arsenic	M
08	02030105030010-01	First Neshanic River	Cause Unknown	L
08	02030105030030-01	Headquarters trib (Third Neshanic River)	Dissolved Oxygen	H
08	02030105030040-01	Third Neshanic River	Dissolved Oxygen	H
08	02030105030050-01	Back Brook	Cause Unknown	L
08	02030105030060-01	Neshanic River (below FNR / SNR confl)	pH	M
08	02030105030060-01	Neshanic River (below FNR / SNR confl)	Phosphorus	H
08	02030105030060-01	Neshanic River (below FNR / SNR confl)	Arsenic	M
08	02030105040010-01	Raritan R SB(Pleasant Run-Three Bridges)	Phosphorus	H
08	02030105040010-01	Raritan R SB(Pleasant Run-Three Bridges)	Arsenic	M
08	02030105040020-01	Pleasant Run	Cause Unknown	L
08	02030105040020-01	Pleasant Run	E. Coli	H
08	02030105040030-01	Holland Brook	Cause Unknown	L
08	02030105040040-01	Raritan R SB(NB to Pleasant Run)	Phosphorus	H
08	02030105040040-01	Raritan R SB(NB to Pleasant Run)	Arsenic	M
08	02030105050020-01	Lamington R (Hillside Rd to Rt 10)	Cause Unknown	L
08	02030105050030-01	Lamington R (Furnace Rd to Hillside Rd)	Temperature	L
08	02030105050040-01	Lamington R(Pottersville gage-FurnaceRd)	Temperature	L
08	02030105050040-01	Lamington R(Pottersville gage-FurnaceRd)	Cause Unknown	M
08	02030105050070-01	Lamington R(HallsBrRd-Pottersville gage)	Temperature	L
08	02030105050100-01	Rockaway Ck SB	Phosphorus	H
08	02030105050110-01	Lamington R (below Halls Bridge Rd)	pH	M
08	02030105050110-01	Lamington R (below Halls Bridge Rd)	Phosphorus	H

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
08	02030105060070-01	Raritan R NB(incl Mine Bk to Peapack Bk)	Cause Unknown	L
08	02030105060080-01	Middle Brook (NB Raritan River)	Cause Unknown	L
08	02030105060080-01	Middle Brook (NB Raritan River)	E. Coli	M
08	02030105070010-01	Raritan R NB (Rt 28 to Lamington R)	Cause Unknown	L
08	02030105070020-01	Chambers Brook	Cause Unknown	L
09	02030105080010-01	Peters Brook	Cause Unknown	L
09	02030105080030-01	Raritan R Lwr (Millstone to Rt 206)	Cause Unknown	L
10	02030105090020-01	Stony Bk (74d 48m 10s to 74d 49m 15s)	E. Coli	M
10	02030105090050-01	Stony Bk(Province Line Rd to 74d46m dam)	Phosphorus	H
10	02030105090050-01	Stony Bk(Province Line Rd to 74d46m dam)	Arsenic	M
10	02030105090060-01	Stony Bk (Rt 206 to Province Line Rd)	Phosphorus	H
10	02030105090060-01	Stony Bk (Rt 206 to Province Line Rd)	Arsenic	M
10	02030105090070-01	Stony Bk (Harrison St to Rt 206)	Phosphorus	H
10	02030105090070-01	Stony Bk (Harrison St to Rt 206)	Arsenic	M
10	02030105090080-01	Duck Pond Run	Cause Unknown	L
10	02030105100010-01	Millstone River (above Rt 33)	Phosphorus	H
10	02030105100010-01	Millstone River (above Rt 33)	Total Suspended Solids	H
10	02030105100010-01	Millstone River (above Rt 33)	Arsenic	M
10	02030105100020-01	Millstone R (Applegarth road to Rt 33)	Phosphorus	H
10	02030105100020-01	Millstone R (Applegarth road to Rt 33)	Total Suspended Solids	H
10	02030105100020-01	Millstone R (Applegarth road to Rt 33)	Arsenic	M
10	02030105100030-01	Millstone R (RockyBk to Applegarth road)	Phosphorus	H
10	02030105100040-01	Rocky Brook (above Monmouth Co line)	Arsenic	M
10	02030105100050-01	Rocky Brook (below Monmouth Co line)	Phosphorus	H
10	02030105100050-01	Rocky Brook (below Monmouth Co line)	Arsenic	M
10	02030105100060-01	Millstone R (Cranbury Bk to Rocky Bk)	Phosphorus	H
10	02030105100060-01	Millstone R (Cranbury Bk to Rocky Bk)	Arsenic	M
10	02030105100070-01	Cranbury Brook (above NJ Turnpike)	Cause Unknown	L
10	02030105100090-01	Cranbury Brook (below NJ Turnpike)	Cause Unknown	L
10	02030105100100-01	Shallow Brook (Devils Brook)	Cause Unknown	L
10	02030105100110-01	Devils Brook	Cause Unknown	L
10	02030105100120-01	Bear Brook (above Trenton Road)	E. Coli	M
10	02030105100120-01	Bear Brook (above Trenton Road)	Arsenic	M
10	02030105100120-01	Bear Brook (above Trenton Road)	Unknown Toxic	L
10	02030105100130-01	Bear Brook (below Trenton Road)	E. Coli	M
10	02030105100130-01	Bear Brook (below Trenton Road)	Arsenic	M
10	02030105100130-01	Bear Brook (below Trenton Road)	Unknown Toxic	L
10	02030105100130-01	Bear Brook (below Trenton Road)	Mercury	M
10	02030105100140-01	Millstone R (Rt 1 to Cranbury Bk)	Arsenic	M
10	02030105110010-01	Heathcote Brook	pH	M
10	02030105110010-01	Heathcote Brook	Total Suspended Solids	L
10	02030105110020-01	Millstone R (HeathcoteBk to Harrison St)	Mercury	M
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	pH	H
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	Temperature	L
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	Phosphorus	H
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	E. Coli	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	Arsenic	M
10	02030105110040-01	Beden Brook (above Province Line Rd)	Cause Unknown	L
10	02030105110050-01	Beden Brook (below Province Line Rd)	Phosphorus	H
10	02030105110050-01	Beden Brook (below Province Line Rd)	Arsenic	M
10	02030105110080-01	Pike Run (above Cruser Brook)	Cause Unknown	L
10	02030105110100-01	Pike Run (below Cruser Brook)	Phosphorus	H
10	02030105110110-01	Millstone R (BlackwellsMills to BedenBk)	Phosphorus	H
10	02030105110110-01	Millstone R (BlackwellsMills to BedenBk)	Arsenic	M
10	02030105110120-01	Sixmile Run (above Middlebush Rd)	Phosphorus	H
10	02030105110140-01	Millstone R(AmwellRd to BlackwellsMills)	Phosphorus	H
10	02030105110140-01	Millstone R(AmwellRd to BlackwellsMills)	Arsenic	M
10	02030105110150-01	Royce Brook (above Branch Royce Brook)	Cause Unknown	L
10	02030105110160-01	Royce Brook (below/incl Branch Royce Bk)	Cause Unknown	L
10	02030105110170-01	Millstone River (below Amwell Rd)	pH	H
10	02030105110170-01	Millstone River (below Amwell Rd)	Phosphorus	H
09	02030105120020-01	Green Bk (N Plainfield gage to Blue Bk)	Cause Unknown	L
09	02030105120030-01	Stony Brook (North Plainfield)	Total Dissolved Solids	L
09	02030105120040-01	Green Bk (Bound Bk to N Plainfield gage)	Cause Unknown	L
09	02030105120050-01	Middle Brook EB	Total Dissolved Solids	L
09	02030105120060-01	Middle Brook WB	Cause Unknown	L
09	02030105120070-01	Cuckels Brook	Cause Unknown	L
09	02030105120080-01	South Fork of Bound Brook	Phosphorus	M
09	02030105120080-01	South Fork of Bound Brook	PCB	M
09	02030105120090-01	Spring Lake Fork of Bound Brook	Phosphorus	M
09	02030105120090-01	Spring Lake Fork of Bound Brook	PCB	M
09	02030105120100-01	Bound Brook (below fork at 74d 25m 15s)	Phosphorus	M
09	02030105120100-01	Bound Brook (below fork at 74d 25m 15s)	PCB	M
09	02030105120100-01	Bound Brook (below fork at 74d 25m 15s)	Dioxin	M
09	02030105120120-01	Ambrose Brook (below Lake Nelson)	Cause Unknown	L
09	02030105120130-01	Green Brook (below Bound Brook)	Phosphorus	M
09	02030105120130-01	Green Brook (below Bound Brook)	Total Suspended Solids	H
09	02030105120130-01	Green Brook (below Bound Brook)	Sulfate	L
09	02030105120130-01	Green Brook (below Bound Brook)	PCB	M
09	02030105120140-01	Raritan R Lwr(I-287 Piscatway-Millstone)	Phosphorus	M
09	02030105120140-01	Raritan R Lwr(I-287 Piscatway-Millstone)	Total Suspended Solids	H
09	02030105120140-01	Raritan R Lwr(I-287 Piscatway-Millstone)	Arsenic	M
09	02030105120140-01	Raritan R Lwr(I-287 Piscatway-Millstone)	Benzene	M
09	02030105120140-01	Raritan R Lwr(I-287 Piscatway-Millstone)	Mercury	M
09	02030105120150-01	Mile Run	Cause Unknown	L
09	02030105120160-01	Raritan R Lwr (MileRun to I-287 Pisctwy)	Phosphorus	H
09	02030105120160-01	Raritan R Lwr (MileRun to I-287 Pisctwy)	Total Suspended Solids	H
09	02030105120160-01	Raritan R Lwr (MileRun to I-287 Pisctwy)	Arsenic	M
09	02030105120160-01	Raritan R Lwr (MileRun to I-287 Pisctwy)	Benzene	M
09	02030105120160-01	Raritan R Lwr (MileRun to I-287 Pisctwy)	PCB	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Phosphorus	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Total Suspended Solids	H

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Arsenic	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Cadmium	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Zinc	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Mercury	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	PCB	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	DDT	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	DDD	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	DDE	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Dieldrin	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Benzo(a)Pyrene	L
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Chlordane	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Heptachlor epoxide	M
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Dioxin	M
09	02030105130020-01	Lawrence Brook (above Deans Pond dam)	Cause Unknown	L
09	02030105130020-01	Lawrence Brook (above Deans Pond dam)	Arsenic	M
09	02030105130040-01	Ireland Brook	pH	L
09	02030105130050-01	Lawrence Bk (Church Lane to Deans Pond)	Cause Unknown	L
09	02030105130050-01	Lawrence Bk (Church Lane to Deans Pond)	E. Coli	M
09	02030105130050-01	Lawrence Bk (Church Lane to Deans Pond)	Arsenic	M
09	02030105130060-01	Lawrence Bk (Milltown to Church Lane)	Cause Unknown	L
09	02030105130060-01	Lawrence Bk (Milltown to Church Lane)	E. Coli	M
09	02030105130060-01	Lawrence Bk (Milltown to Church Lane)	Arsenic	M
09	02030105130070-01	Lawrence Bk (below Milltown/Herberts br)	Cause Unknown	L
09	02030105130070-01	Lawrence Bk (below Milltown/Herberts br)	PCB	M
09	02030105130070-01	Lawrence Bk (below Milltown/Herberts br)	Dioxin	M
09	02030105140010-01	Manalapan Brook (above 40d 16m 15s)	Phosphorus	H
09	02030105140020-01	Manalapan Bk(incl LkManlpn to 40d16m15s)	Phosphorus	H
09	02030105140030-01	Manalapan Brook (below Lake Manalapan)	Cause Unknown	L
09	02030105140030-01	Manalapan Brook (below Lake Manalapan)	Arsenic	M
09	02030105140030-01	Manalapan Brook (below Lake Manalapan)	Mercury	M
09	02030105150010-01	Weamaconk Creek	Phosphorus	M
09	02030105150010-01	Weamaconk Creek	Total Suspended Solids	H
09	02030105150010-01	Weamaconk Creek	Turbidity	L
09	02030105150020-01	McGellairds Brook (above Taylors Mills)	Cause Unknown	L
09	02030105150030-01	McGellairds Brook (below Taylors Mills)	Phosphorus	H
09	02030105150040-01	Matchaponix Brook (above/incl Pine Bk)	Cause Unknown	L
09	02030105150050-01	Barclay Brook	pH	H
09	02030105150050-01	Barclay Brook	E. Coli	M
09	02030105150060-01	Matchaponix Brook (below Pine Brook)	Phosphorus	H
09	02030105150060-01	Matchaponix Brook (below Pine Brook)	Nitrate	M
09	02030105160010-01	Deep Run (above Monmouth Co line)	Dissolved Oxygen	M
09	02030105160020-01	Deep Run (Rt 9 to Monmouth Co line)	Dissolved Oxygen	M
09	02030105160030-01	Duhernal Lake / Iresick Brook	Cause Unknown	L
09	02030105160040-01	Deep Run (below Rt 9)	Dissolved Oxygen	M
09	02030105160070-01	South River (below Duhernal Lake)	Arsenic	M
09	02030105160070-01	South River (below Duhernal Lake)	Cadmium	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
09	02030105160070-01	South River (below Duhernal Lake)	PCB	M
09	02030105160070-01	South River (below Duhernal Lake)	Dioxin	M
09	02030105160070-01	South River (below Duhernal Lake)	Lead	M
09	02030105160070-01	South River (below Duhernal Lake)	Mercury	M
09	02030105160070-01	South River (below Duhernal Lake)	Copper	M
09	02030105160070-01	South River (below Duhernal Lake)	Chromium	M
09	02030105160080-01	Mill Brook / Martins Creek	Cause Unknown	L
09	02030105160080-01	Mill Brook / Martins Creek	PCB	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	Mercury	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	PCB	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	DDT	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	DDD	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	DDE	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	Dioxin	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	Dieldrin	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	Benzo(a)Pyrene	L
09	02030105160090-01	Red Root Creek / Crows Mill Creek	Chlordane	M
09	02030105160090-01	Red Root Creek / Crows Mill Creek	Heptachlor epoxide	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Dissolved Oxygen	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Arsenic	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Cadmium	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Mercury	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	PCB	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	DDT	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	DDD	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	DDE	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Dioxin	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Dieldrin	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Benzo(a)Pyrene	L
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Chlordane	M
09	02030105160100-01	Raritan R Lwr (below Lawrence Bk)	Heptachlor epoxide	M
16	02030902940020-01	At Coast(Corson to Townsends In)inshore	Dissolved Oxygen	M
16	02030902940020-01	At Coast(Corson to Townsends In)inshore	Mercury	M
16	02030902940020-01	At Coast(Corson to Townsends In)inshore	PCB	M
16	02030902940020-01	At Coast(Corson to Townsends In)inshore	DDT	M
16	02030902940020-01	At Coast(Corson to Townsends In)inshore	DDD	M
16	02030902940020-01	At Coast(Corson to Townsends In)inshore	DDE	M
16	02030902940020-02	At Coast(Corson to Townsends In)offshore	Dissolved Oxygen	M
16	02030902940020-02	At Coast(Corson to Townsends In)offshore	Mercury	M
16	02030902940020-02	At Coast(Corson to Townsends In)offshore	PCB	M
16	02030902940020-02	At Coast(Corson to Townsends In)offshore	DDT	M
16	02030902940020-02	At Coast(Corson to Townsends In)offshore	DDD	M
16	02030902940020-02	At Coast(Corson to Townsends In)offshore	DDE	M
16	02030902940030-01	Atl Cst(Townsends to Hereford In)inshor	Dissolved Oxygen	M
16	02030902940030-01	Atl Cst(Townsends to Hereford In)inshor	Mercury	M
16	02030902940030-01	Atl Cst(Townsends to Hereford In)inshor	PCB	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
16	02030902940030-01	Atl Cst(Townsends to Hereford In)inshor	DDT	M
16	02030902940030-01	Atl Cst(Townsends to Hereford In)inshor	DDD	M
16	02030902940030-01	Atl Cst(Townsends to Hereford In)inshor	DDE	M
16	02030902940030-02	Atl Cst(Townsends to Hereford In)offshor	Dissolved Oxygen	M
16	02030902940030-02	Atl Cst(Townsends to Hereford In)offshor	Mercury	M
16	02030902940030-02	Atl Cst(Townsends to Hereford In)offshor	PCB	M
16	02030902940030-02	Atl Cst(Townsends to Hereford In)offshor	DDT	M
16	02030902940030-02	Atl Cst(Townsends to Hereford In)offshor	DDD	M
16	02030902940030-02	Atl Cst(Townsends to Hereford In)offshor	DDE	M
01	02040104090020-01	Clove Brook (Delaware R)	Mercury	M
01	02040104090030-01	Shimers Brook	Temperature	L
01	02040104090030-01	Shimers Brook	Phosphorus	M
01	02040104090030-01	Shimers Brook	E. Coli	M
01	02040104130010-01	Little Flat Brook (Beerskill and above)	Temperature	L
01	02040104130010-01	Little Flat Brook (Beerskill and above)	Mercury	M
01	02040104130020-01	Little Flat Brook (Layton to Beerskill)	Temperature	L
01	02040104130030-01	Little Flat Brook (Confluence to Layton)	Temperature	L
01	02040104140010-01	Big Flat Brook (above Forked Brook)	Mercury	M
01	02040104150010-01	Flat Brook (Tillman Brook to Confluence)	Temperature	L
01	02040104150010-01	Flat Brook (Tillman Brook to Confluence)	E. Coli	M
01	02040104150010-01	Flat Brook (Tillman Brook to Confluence)	Cause Unknown	M
01	02040104150020-01	Flat Brook (below Tillman Brook)	Temperature	L
01	02040104150020-01	Flat Brook (below Tillman Brook)	E. Coli	M
01	02040104150020-01	Flat Brook (below Tillman Brook)	Cause Unknown	M
01	02040104240010-01	Van Campens Brook	pH	M
01	02040105030010-01	Swartswood trib(41-06-06 thru Lk Owassa)	Temperature	L
01	02040105030020-01	Swartswood Lake and tribs	Temperature	L
01	02040105030020-01	Swartswood Lake and tribs	Mercury	M
01	02040105030030-01	Trout Brook	Mercury	M
01	02040105040010-01	Culvers Creek	Cause Unknown	L
01	02040105040020-01	Dry Brook	Cause Unknown	L
01	02040105040040-01	Lafayette Swamp tribs	Cause Unknown	L
01	02040105040050-01	Sparta Junction tribs	Cause Unknown	L
01	02040105040060-01	Paulins Kill (above Rt 15)	Dissolved Oxygen	M
01	02040105040060-01	Paulins Kill (above Rt 15)	Phosphorus	M
01	02040105040080-01	Paulins Kill (PK Lk outlet to Dry Brook)	Arsenic	M
01	02040105040090-01	Paulins Kill (Stillwater Vil to PK Lake)	Cause Unknown	L
01	02040105040090-01	Paulins Kill (Stillwater Vil to PK Lake)	Temperature	L
01	02040105050010-01	Paulins Kill (Blairstown to Stillwater)	Temperature	L
01	02040105050010-01	Paulins Kill (Blairstown to Stillwater)	Cause Unknown	M
01	02040105050040-01	Yards Creek	Cause Unknown	L
01	02040105050050-01	Paulins Kill (below Blairstown gage)	Temperature	L
01	02040105050050-01	Paulins Kill (below Blairstown gage)	Cause Unknown	M
01	02040105070030-01	Pequest River (above Brighton)	Cause Unknown	L
01	02040105070040-01	Pequest River (Trout Brook to Brighton)	Cause Unknown	L
01	02040105070040-01	Pequest River (Trout Brook to Brighton)	E. Coli	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
01	02040105070050-01	Trout Brook/Lake Tranquility	Cause Unknown	L
01	02040105070060-01	Pequest R (below Bear Swamp to Trout Bk)	Phosphorus	M
01	02040105080010-01	Bear Brook (Sussex/Warren Co)	Cause Unknown	L
01	02040105080010-01	Bear Brook (Sussex/Warren Co)	E. Coli	M
01	02040105080020-01	Bear Creek	Cause Unknown	L
01	02040105090010-01	Pequest R (Drag Strip--below Bear Swamp)	Phosphorus	M
01	02040105090020-01	Pequest R (Cemetary Road to Drag Strip)	Phosphorus	H
01	02040105090030-01	Pequest R (Furnace Bk to Cemetary Road)	Phosphorus	H
01	02040105090030-01	Pequest R (Furnace Bk to Cemetary Road)	Total Suspended Solids	L
01	02040105090040-01	Mountain Lake Brook	Mercury	M
01	02040105090050-01	Furnace Brook	Cause Unknown	L
01	02040105090060-01	Pequest R (below Furnace Brook)	pH	L
01	02040105090060-01	Pequest R (below Furnace Brook)	Temperature	L
01	02040105090060-01	Pequest R (below Furnace Brook)	Phosphorus	L
01	02040105090060-01	Pequest R (below Furnace Brook)	Total Suspended Solids	L
01	02040105090060-01	Pequest R (below Furnace Brook)	Arsenic	M
01	02040105100020-01	Honey Run	Dissolved Oxygen	M
01	02040105100020-01	Honey Run	Cause Unknown	M
01	02040105100030-01	Beaver Brook (above Hope Village)	Cause Unknown	L
01	02040105120010-01	Lopatcong Creek (above Rt 57)	Cause Unknown	L
01	02040105120020-01	Lopatcong Creek (below Rt 57) incl UDRV	Cause Unknown	L
01	02040105140010-01	Pohatcong Creek (above Rt 31)	Temperature	L
01	02040105140020-01	Pohatcong Ck (Brass Castle Ck to Rt 31)	Dissolved Oxygen	M
01	02040105140020-01	Pohatcong Ck (Brass Castle Ck to Rt 31)	pH	M
01	02040105140020-01	Pohatcong Ck (Brass Castle Ck to Rt 31)	Temperature	L
01	02040105140020-01	Pohatcong Ck (Brass Castle Ck to Rt 31)	Phosphorus	M
01	02040105140020-01	Pohatcong Ck (Brass Castle Ck to Rt 31)	Total Suspended Solids	L
01	02040105140030-01	Pohatcong Ck (Edison Rd-Brass Castle Ck)	pH	M
01	02040105140030-01	Pohatcong Ck (Edison Rd-Brass Castle Ck)	Temperature	L
01	02040105140030-01	Pohatcong Ck (Edison Rd-Brass Castle Ck)	Phosphorus	M
01	02040105140030-01	Pohatcong Ck (Edison Rd-Brass Castle Ck)	Total Suspended Solids	L
01	02040105140040-01	Merrill Creek	Mercury	M
01	02040105140050-01	Pohatcong Ck (Merrill Ck to Edison Rd)	pH	M
01	02040105140050-01	Pohatcong Ck (Merrill Ck to Edison Rd)	Temperature	L
01	02040105140050-01	Pohatcong Ck (Merrill Ck to Edison Rd)	Phosphorus	M
01	02040105140050-01	Pohatcong Ck (Merrill Ck to Edison Rd)	Total Suspended Solids	L
01	02040105140060-01	Pohatcong Ck (Springtown to Merrill Ck)	Phosphorus	M
01	02040105140070-01	Pohatcong Ck(below Springtown) incl UDRV	Phosphorus	M
01	02040105150020-01	Lake Hopatcong	pH	M
01	02040105150020-01	Lake Hopatcong	Mercury	M
01	02040105150030-01	Musconetcong R (Wills Bk to LkHopatcong)	pH	M
01	02040105150030-01	Musconetcong R (Wills Bk to LkHopatcong)	Temperature	L
01	02040105150030-01	Musconetcong R (Wills Bk to LkHopatcong)	Nitrate	M
01	02040105150030-01	Musconetcong R (Wills Bk to LkHopatcong)	Phosphorus	H
01	02040105150050-01	Lubbers Run (below Dallis Pond)	pH	M
01	02040105150050-01	Lubbers Run (below Dallis Pond)	Temperature	L

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
01	02040105150060-01	Cranberry Lake / Jefferson Lake & tribs	Mercury	M
01	02040105150070-01	Musconetcong R(Waterloo to/incl WillsBk)	pH	M
01	02040105150070-01	Musconetcong R(Waterloo to/incl WillsBk)	Temperature	L
01	02040105150080-01	Musconetcong R (SaxtonFalls to Waterloo)	Arsenic	M
01	02040105150090-01	Mine Brook (Morris Co)	Cause Unknown	L
01	02040105150100-01	Musconetcong R (Trout Bk to SaxtonFalls)	Cause Unknown	L
01	02040105150100-01	Musconetcong R (Trout Bk to SaxtonFalls)	Arsenic	M
01	02040105160010-01	Musconetcong R (Hances Bk thru Trout Bk)	Cause Unknown	L
01	02040105160010-01	Musconetcong R (Hances Bk thru Trout Bk)	Temperature	L
01	02040105160010-01	Musconetcong R (Hances Bk thru Trout Bk)	Arsenic	M
01	02040105160020-01	Musconetcong R (Changewater to HancesBk)	Cause Unknown	L
01	02040105160020-01	Musconetcong R (Changewater to HancesBk)	Temperature	L
01	02040105160020-01	Musconetcong R (Changewater to HancesBk)	Arsenic	M
01	02040105160030-01	Musconetcong R (Rt 31 to Changewater)	Temperature	L
01	02040105160030-01	Musconetcong R (Rt 31 to Changewater)	Cause Unknown	M
01	02040105160040-01	Musconetcong R (75d 00m to Rt 31)	Temperature	L
01	02040105160040-01	Musconetcong R (75d 00m to Rt 31)	Cause Unknown	M
01	02040105160050-01	Musconetcong R (I-78 to 75d 00m)	Temperature	L
01	02040105160060-01	Musconetcong R (Warren Glen to I-78)	Temperature	L
01	02040105160070-01	Musconetcong R (below Warren Glen)	Temperature	L
11	02040105170020-01	Hakihokake Creek	Phosphorus	M
11	02040105170030-01	Harihokake Creek (and to Hakihokake Ck)	Phosphorus	M
11	02040105170030-01	Harihokake Creek (and to Hakihokake Ck)	E. Coli	M
11	02040105170040-01	Nishisakawick Creek (above 40d 33m)	pH	M
11	02040105170050-01	Nishisakawick Creek (below 40d 33m)	pH	M
11	02040105170060-01	Kingwood Twp(Warford-Little Nishisakawk)	Phosphorus	M
11	02040105200010-01	Lockatong Ck (above Rt 12)	pH	M
11	02040105200010-01	Lockatong Ck (above Rt 12)	Temperature	L
11	02040105200010-01	Lockatong Ck (above Rt 12)	E. Coli	M
11	02040105200010-01	Lockatong Ck (above Rt 12)	Turbidity	L
11	02040105200020-01	Lockatong Ck (Milltown to Rt 12)	pH	M
11	02040105200020-01	Lockatong Ck (Milltown to Rt 12)	Temperature	L
11	02040105200020-01	Lockatong Ck (Milltown to Rt 12)	Turbidity	L
11	02040105200020-01	Lockatong Ck (Milltown to Rt 12)	E. Coli	M
11	02040105200030-01	Lockatong Ck (below Milltown) incl UDRV	pH	M
11	02040105200030-01	Lockatong Ck (below Milltown) incl UDRV	Temperature	L
11	02040105200030-01	Lockatong Ck (below Milltown) incl UDRV	Turbidity	L
11	02040105200030-01	Lockatong Ck (below Milltown) incl UDRV	E. Coli	M
11	02040105200050-01	Plum Creek	Cause Unknown	L
11	02040105200060-01	Wickecheoke Creek (below Locktown)	Temperature	L
11	02040105210010-01	Alexauken Ck (above 74d 55m)	Temperature	L
11	02040105210020-01	Alexauken Ck (below 74d 55m to 11BA06)	Temperature	L
11	02040105210030-01	Swan Creek (Moore Ck to Alexauken Ck)	Cause Unknown	L
11	02040105210040-01	Moore Creek	Cause Unknown	L
11	02040105210060-01	Jacobs Creek (above Woolsey Brook)	Phosphorus	L
11	02040105210060-01	Jacobs Creek (above Woolsey Brook)	Arsenic	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
11	02040105210060-01	Jacobs Creek (above Woolsey Brook)	Mercury	M
11	02040105210070-01	Jacobs Creek (below/incl Woolsey Brook)	pH	M
11	02040105210080-01	Mercer (Calhoun St to Jacobs Creek)	Cause Unknown	L
11	02040105230010-01	Assunpink Ck (above Assunpink Lake)	Cause Unknown	L
11	02040105230020-01	Assunpink Ck (NewSharonBr to/incl Lake)	Cause Unknown	L
11	02040105230020-01	Assunpink Ck (NewSharonBr to/incl Lake)	Mercury	M
11	02040105230030-01	New Sharon Branch (Assunpink Creek)	Phosphorus	M
11	02040105230030-01	New Sharon Branch (Assunpink Creek)	Mercury	M
11	02040105230040-01	Assunpink Ck (TrentonRd to NewSharonBr)	Cause Unknown	L
11	02040105230040-01	Assunpink Ck (TrentonRd to NewSharonBr)	E. Coli	M
11	02040105230040-01	Assunpink Ck (TrentonRd to NewSharonBr)	Arsenic	M
11	02040105230040-01	Assunpink Ck (TrentonRd to NewSharonBr)	Mercury	M
11	02040105230050-01	Assunpink Ck (Shipetaukin to Trenton Rd)	Cause Unknown	L
11	02040105230050-01	Assunpink Ck (Shipetaukin to Trenton Rd)	Arsenic	M
11	02040105230050-01	Assunpink Ck (Shipetaukin to Trenton Rd)	Mercury	M
11	02040105230060-01	Shipetaukin Creek	Cause Unknown	L
11	02040105230060-01	Shipetaukin Creek	E. Coli	M
11	02040105240010-01	Shabakunk Creek	Cause Unknown	L
11	02040105240010-01	Shabakunk Creek	Mercury	M
11	02040105240030-01	Miry Run (Assunpink Cr)	Dissolved Oxygen	M
11	02040105240040-01	Pond Run	Total Suspended Solids	L
11	02040105240040-01	Pond Run	Turbidity	L
11	02040105240050-01	Assunpink Creek (below Shipetaukin Ck)	Dissolved Oxygen	M
11	02040105240050-01	Assunpink Creek (below Shipetaukin Ck)	Phosphorus	M
11	02040105240050-01	Assunpink Creek (below Shipetaukin Ck)	Arsenic	M
11	02040105240050-01	Assunpink Creek (below Shipetaukin Ck)	Lead	M
11	02040105240050-01	Assunpink Creek (below Shipetaukin Ck)	Mercury	M
20	02040201030010-01	Duck Creek and UDRV to Assunpink Ck	Mercury	M
20	02040201030010-01	Duck Creek and UDRV to Assunpink Ck	PCB	M
20	02040201040030-01	South Run (Jumping Brook to 74d35m)	pH	M
20	02040201040030-01	South Run (Jumping Brook to 74d35m)	Phosphorus	M
20	02040201040030-01	South Run (Jumping Brook to 74d35m)	E. Coli	H
20	02040201040040-01	Jumping Brook (Monmouth Co)	Mercury	M
20	02040201040050-01	South Run (North Run to Jumping Brook)	Phosphorus	M
20	02040201040050-01	South Run (North Run to Jumping Brook)	Mercury	M
20	02040201040060-01	North Run (above Wrightstown bypass)	Phosphorus	M
20	02040201040060-01	North Run (above Wrightstown bypass)	Total Suspended Solids	L
20	02040201040060-01	North Run (above Wrightstown bypass)	Arsenic	M
20	02040201040070-01	Crosswicks Ck(NewEgypt to/incl NorthRun)	Phosphorus	M
20	02040201040070-01	Crosswicks Ck(NewEgypt to/incl NorthRun)	Total Suspended Solids	L
20	02040201040070-01	Crosswicks Ck(NewEgypt to/incl NorthRun)	Arsenic	M
20	02040201040070-01	Crosswicks Ck(NewEgypt to/incl NorthRun)	Mercury	M
20	02040201050010-01	Lahaway Creek (above Prospertown)	Cause Unknown	L
20	02040201050020-01	Lahaway Ck(Allentwn/NE Road-Prospertown)	Phosphorus	M
20	02040201050030-01	Crosswicks Ck(Lahaway Ck to New Egypt)	Phosphorus	M
20	02040201050030-01	Crosswicks Ck(Lahaway Ck to New Egypt)	Mercury	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
20	02040201050040-01	Crosswicks Ck(Walnford to Lahaway Ck)	Phosphorus	M
20	02040201050040-01	Crosswicks Ck(Walnford to Lahaway Ck)	Arsenic	M
20	02040201050040-01	Crosswicks Ck(Walnford to Lahaway Ck)	Mercury	M
20	02040201050050-01	Crosswicks Ck(Ellisdale trib - Walnford)	Phosphorus	M
20	02040201050050-01	Crosswicks Ck(Ellisdale trib - Walnford)	Arsenic	M
20	02040201050050-01	Crosswicks Ck(Ellisdale trib - Walnford)	Mercury	M
20	02040201050060-01	Ellisdale trib (Crosswicks Creek)	Cause Unknown	L
20	02040201050060-01	Ellisdale trib (Crosswicks Creek)	Mercury	M
20	02040201050070-01	Crosswicks Ck(Doctors Ck-Ellisdale trib)	Phosphorus	M
20	02040201050070-01	Crosswicks Ck(Doctors Ck-Ellisdale trib)	Total Suspended Solids	L
20	02040201050070-01	Crosswicks Ck(Doctors Ck-Ellisdale trib)	Turbidity	L
20	02040201050070-01	Crosswicks Ck(Doctors Ck-Ellisdale trib)	Arsenic	M
20	02040201050070-01	Crosswicks Ck(Doctors Ck-Ellisdale trib)	Mercury	M
20	02040201050070-01	Crosswicks Ck(Doctors Ck-Ellisdale trib)	PCB	M
20	02040201060020-01	Doctors Creek (Allentown to 74d28m40s)	Phosphorus	M
20	02040201060030-01	Doctors Creek (below Allentown)	Cause Unknown	M
20	02040201070010-01	Back Creek (above Yardville-H Sq Road)	Phosphorus	M
20	02040201070020-01	Crosswicks Ck(below Doctors Creek)	Phosphorus	M
20	02040201070020-01	Crosswicks Ck(below Doctors Creek)	Turbidity	L
20	02040201070020-01	Crosswicks Ck(below Doctors Creek)	Arsenic	M
20	02040201070020-01	Crosswicks Ck(below Doctors Creek)	Mercury	M
20	02040201070020-01	Crosswicks Ck(below Doctors Creek)	PCB	M
20	02040201070030-01	Shady Brook/Spring Lake/Rowan Lake	Mercury	M
20	02040201070030-01	Shady Brook/Spring Lake/Rowan Lake	PCB	M
20	02040201080020-01	Blacks Creek (Bacons Run to 40d06m10s)	Cause Unknown	L
20	02040201080030-01	Blacks Creek (below Bacons Run)	Phosphorus	M
20	02040201080030-01	Blacks Creek (below Bacons Run)	Total Suspended Solids	L
20	02040201080030-01	Blacks Creek (below Bacons Run)	E. Coli	M
20	02040201080030-01	Blacks Creek (below Bacons Run)	PCB	M
20	02040201090010-01	Crafts Creek (above Rt 206)	Phosphorus	M
20	02040201090020-01	Crafts Creek (below Rt 206)	Cause Unknown	L
20	02040201090020-01	Crafts Creek (below Rt 206)	Arsenic	M
20	02040201090020-01	Crafts Creek (below Rt 206)	PCB	M
20	02040201090030-01	LDRV tribs (Assiscunk Ck to Blacks Ck)	Mercury	M
20	02040201090030-01	LDRV tribs (Assiscunk Ck to Blacks Ck)	PCB	M
20	02040201100010-01	Assiscunk Creek (above Rt 206)	Arsenic	M
20	02040201100020-01	Barkers Brook (above 40d02m30s)	Arsenic	M
20	02040201100020-01	Barkers Brook (above 40d02m30s)	Cause Unknown	L
20	02040201100040-01	Assiscunk Ck (Jacksonville rd to Rt 206)	Cause Unknown	L
20	02040201100040-01	Assiscunk Ck (Jacksonville rd to Rt 206)	Arsenic	M
20	02040201100050-01	Assiscunk Ck(Neck Rd to Jacksonville rd)	Cause Unknown	L
20	02040201100050-01	Assiscunk Ck(Neck Rd to Jacksonville rd)	Arsenic	M
20	02040201100050-01	Assiscunk Ck(Neck Rd to Jacksonville rd)	PCB	M
20	02040201100060-01	Assiscunk Creek (below Neck Rd)	Cause Unknown	L
20	02040201100060-01	Assiscunk Creek (below Neck Rd)	PCB	M
20	02040201110010-01	LDRV tribs (Beverly to Assiscunk Ck)	PCB	M

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19	02040202020010-01	Gaunts Brook / Hartshorne Mill Stream	Copper	M
19	02040202020010-01	Gaunts Brook / Hartshorne Mill Stream	Lead	M
19	02040202020020-01	Ong Run / Jacks Run	pH	M
19	02040202020020-01	Ong Run / Jacks Run	E. Coli	M
19	02040202020030-01	Rancocas Ck NB (incl Mirror Lk-GauntsBk)	pH	M
19	02040202020030-01	Rancocas Ck NB (incl Mirror Lk-GauntsBk)	Phosphorus	M
19	02040202020030-01	Rancocas Ck NB (incl Mirror Lk-GauntsBk)	E. Coli	M
19	02040202020030-01	Rancocas Ck NB (incl Mirror Lk-GauntsBk)	Copper	M
19	02040202020030-01	Rancocas Ck NB (incl Mirror Lk-GauntsBk)	Lead	M
19	02040202020030-01	Rancocas Ck NB (incl Mirror Lk-GauntsBk)	Mercury	M
19	02040202020040-01	Rancocas Ck NB (NL dam to Mirror Lk)	pH	M
19	02040202020040-01	Rancocas Ck NB (NL dam to Mirror Lk)	Phosphorus	H
19	02040202020040-01	Rancocas Ck NB (NL dam to Mirror Lk)	E. Coli	M
19	02040202020040-01	Rancocas Ck NB (NL dam to Mirror Lk)	Mercury	M
19	02040202030050-01	Bucks Cove Run / Cranberry Branch	Mercury	M
19	02040202030090-01	Greenwood Br(below CountryLk & MM confl)	PCB	M
19	02040202030090-01	Greenwood Br(below CountryLk & MM confl)	DDD	M
19	02040202030090-01	Greenwood Br(below CountryLk & MM confl)	DDE	M
19	02040202030090-01	Greenwood Br(below CountryLk & MM confl)	DDT	M
19	02040202040010-01	Rancocas Ck NB (Pemberton br to NL dam)	pH	M
19	02040202040010-01	Rancocas Ck NB (Pemberton br to NL dam)	Arsenic	M
19	02040202040010-01	Rancocas Ck NB (Pemberton br to NL dam)	Copper	M
19	02040202040010-01	Rancocas Ck NB (Pemberton br to NL dam)	Lead	M
19	02040202040020-01	Pemberton / Ft Dix trib (NB Rancocas Ck)	Cause Unknown	L
19	02040202040030-01	Rancocas Ck NB (Rt 206 to Pemberton br)	Phosphorus	H
19	02040202040030-01	Rancocas Ck NB (Rt 206 to Pemberton br)	Arsenic	M
19	02040202040030-01	Rancocas Ck NB (Rt 206 to Pemberton br)	Copper	M
19	02040202040030-01	Rancocas Ck NB (Rt 206 to Pemberton br)	Lead	M
19	02040202040040-01	Rancocas Creek NB (Smithville to Rt 206)	Phosphorus	H
19	02040202040040-01	Rancocas Creek NB (Smithville to Rt 206)	Arsenic	M
19	02040202040050-01	Rancocas Creek NB (below Smithville)	Phosphorus	H
19	02040202040050-01	Rancocas Creek NB (below Smithville)	Arsenic	M
19	02040202040050-01	Rancocas Creek NB (below Smithville)	PCB	M
19	02040202050010-01	Burrs Mill Bk (above 39d51m30s road)	Dissolved Oxygen	M
19	02040202050010-01	Burrs Mill Bk (above 39d51m30s road)	Arsenic	M
19	02040202050020-01	Burrs Mill Bk (Burnt Br Br- 39-51-30 rd)	Dissolved Oxygen	M
19	02040202050020-01	Burrs Mill Bk (Burnt Br Br- 39-51-30 rd)	Arsenic	M
19	02040202050030-01	Burrs Mill Bk (BurrsMill to Burnt Br Br)	Dissolved Oxygen	M
19	02040202050030-01	Burrs Mill Bk (BurrsMill to Burnt Br Br)	Arsenic	M
19	02040202050050-01	Friendship Ck (below/incl Burrs Mill Bk)	pH	M
19	02040202050050-01	Friendship Ck (below/incl Burrs Mill Bk)	Phosphorus	H
19	02040202050050-01	Friendship Ck (below/incl Burrs Mill Bk)	E. Coli	M
19	02040202050050-01	Friendship Ck (below/incl Burrs Mill Bk)	Arsenic	M
19	02040202050060-01	Rancocas Creek SB(above Friendship Ck)	pH	M
19	02040202050060-01	Rancocas Creek SB(above Friendship Ck)	Phosphorus	M
19	02040202050060-01	Rancocas Creek SB(above Friendship Ck)	E. Coli	L

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19	02040202050060-01	Rancocas Creek SB(above Friendship Ck)	Arsenic	M
19	02040202050060-01	Rancocas Creek SB(above Friendship Ck)	PCB	M
19	02040202050070-01	Jade Run	Dissolved Oxygen	M
19	02040202050070-01	Jade Run	pH	M
19	02040202050070-01	Jade Run	Phosphorus	H
19	02040202050080-01	Rancocas Ck SB (Vincentown-FriendshipCk)	Dissolved Oxygen	M
19	02040202050080-01	Rancocas Ck SB (Vincentown-FriendshipCk)	pH	M
19	02040202050080-01	Rancocas Ck SB (Vincentown-FriendshipCk)	Phosphorus	H
19	02040202050080-01	Rancocas Ck SB (Vincentown-FriendshipCk)	E. Coli	M
19	02040202050080-01	Rancocas Ck SB (Vincentown-FriendshipCk)	Arsenic	M
19	02040202050080-01	Rancocas Ck SB (Vincentown-FriendshipCk)	PCB	M
19	02040202050090-01	Rancocas Ck SB (BobbysRun to Vincentown)	pH	M
19	02040202050090-01	Rancocas Ck SB (BobbysRun to Vincentown)	Phosphorus	H
19	02040202050090-01	Rancocas Ck SB (BobbysRun to Vincentown)	Arsenic	M
19	02040202050090-01	Rancocas Ck SB (BobbysRun to Vincentown)	PCB	M
19	02040202060010-01	Kettle Run (above Centennial Lake)	pH	M
19	02040202060030-01	Haynes Creek (below Lake Pine)	Cause Unknown	L
19	02040202060040-01	Barton Run (above Kettle Run Road)	Dissolved Oxygen	M
19	02040202060040-01	Barton Run (above Kettle Run Road)	pH	M
19	02040202060040-01	Barton Run (above Kettle Run Road)	Arsenic	M
19	02040202060050-01	Barton Run (below Kettle Run Road)	Dissolved Oxygen	M
19	02040202060050-01	Barton Run (below Kettle Run Road)	pH	M
19	02040202060050-01	Barton Run (below Kettle Run Road)	Arsenic	M
19	02040202060080-01	Rancocas Ck SW Branch (above Medford br)	pH	M
19	02040202060080-01	Rancocas Ck SW Branch (above Medford br)	Phosphorus	H
19	02040202060080-01	Rancocas Ck SW Branch (above Medford br)	Nitrate	M
19	02040202060080-01	Rancocas Ck SW Branch (above Medford br)	Total Suspended Solids	L
19	02040202060080-01	Rancocas Ck SW Branch (above Medford br)	E. Coli	H
19	02040202060080-01	Rancocas Ck SW Branch (above Medford br)	Arsenic	M
19	02040202060100-01	Rancocas Ck SW Branch (below Medford br)	Dissolved Oxygen	M
19	02040202060100-01	Rancocas Ck SW Branch (below Medford br)	pH	M
19	02040202060100-01	Rancocas Ck SW Branch (below Medford br)	Phosphorus	H
19	02040202060100-01	Rancocas Ck SW Branch (below Medford br)	Arsenic	M
19	02040202060100-01	Rancocas Ck SW Branch (below Medford br)	PCB	M
19	02040202070010-01	Bobbys Run	Cause Unknown	L
19	02040202070010-01	Bobbys Run	PCB	M
19	02040202070020-01	Rancocas Creek SB (Rt 38 to Bobbys Run)	Phosphorus	H
19	02040202070020-01	Rancocas Creek SB (Rt 38 to Bobbys Run)	E. Coli	M
19	02040202070020-01	Rancocas Creek SB (Rt 38 to Bobbys Run)	Arsenic	M
19	02040202070020-01	Rancocas Creek SB (Rt 38 to Bobbys Run)	PCB	M
19	02040202070030-01	Rancocas Creek SB (below Rt 38)	Phosphorus	H
19	02040202070030-01	Rancocas Creek SB (below Rt 38)	E. Coli	M
19	02040202070030-01	Rancocas Creek SB (below Rt 38)	Arsenic	M
19	02040202070030-01	Rancocas Creek SB (below Rt 38)	PCB	M
19	02040202080010-01	Parkers Creek (above Marne Highway)	Phosphorus	L
19	02040202080020-01	Rancocas Creek (Martins Beach to NB/SB)	Phosphorus	H

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19	02040202080020-01	Rancocas Creek (Martins Beach to NB/SB)	PCB	M
19	02040202080030-01	Mill Creek (Willingboro)	Cause Unknown	L
19	02040202080030-01	Mill Creek (Willingboro)	Arsenic	M
19	02040202080030-01	Mill Creek (Willingboro)	PCB	M
19	02040202080040-01	Rancocas Creek (Rt 130 to Martins Beach)	PCB	M
19	02040202080050-01	Rancocas Creek (below Rt 130)	PCB	M
18	02040202090010-01	Swede Run	Dissolved Oxygen	M
18	02040202090010-01	Swede Run	Arsenic	M
18	02040202090010-01	Swede Run	PCB	M
	02040202090020-01	Pompeston Creek (above Rt 130)	Phosphorus	M
	02040202090020-01	Pompeston Creek (above Rt 130)	E. Coli	M
18	02040202090030-01	Pompeston Ck (below Rt130/Swede to 40d)	Cause Unknown	L
18	02040202090030-01	Pompeston Ck (below Rt130/Swede to 40d)	PCB	M
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	Cause Unknown	L
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	Arsenic	M
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	Mercury	M
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	Chlordane	M
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	PCB	M
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	DDT	M
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	DDD	M
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	DDE	M
18	02040202100030-01	Pennsauken Ck NB (below Strawbridge Lk)	Cause Unknown	L
18	02040202100030-01	Pennsauken Ck NB (below Strawbridge Lk)	Arsenic	M
18	02040202100040-01	Pennsauken Ck SB (above Rt 41)	Dissolved Oxygen	M
18	02040202100040-01	Pennsauken Ck SB (above Rt 41)	Phosphorus	H
18	02040202100040-01	Pennsauken Ck SB (above Rt 41)	Total Suspended Solids	L
18	02040202100040-01	Pennsauken Ck SB (above Rt 41)	Arsenic	M
18	02040202100050-01	Pennsauken Ck SB (below Rt 41)	Phosphorus	H
18	02040202100050-01	Pennsauken Ck SB (below Rt 41)	Total Suspended Solids	L
18	02040202100050-01	Pennsauken Ck SB (below Rt 41)	Arsenic	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Dissolved Oxygen	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Phosphorus	H
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Arsenic	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Cadmium	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Chromium	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Copper	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Lead	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Mercury	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Chlordane	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	PCB	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	DDT	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	DDD	M
18	02040202100060-01	Pennsauken Ck (below NB / SB)	DDE	M
18	02040202110010-01	Cooper River NB(above Springdale Road)	Dissolved Oxygen	M
18	02040202110010-01	Cooper River NB(above Springdale Road)	Arsenic	M
18	02040202110010-01	Cooper River NB(above Springdale Road)	PCB	M

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18	02040202110010-01	Cooper River NB(above Springdale Road)	DDT	M
18	02040202110010-01	Cooper River NB(above Springdale Road)	DDD	M
18	02040202110010-01	Cooper River NB(above Springdale Road)	DDE	M
18	02040202110020-01	Cooper River NB(below Springdale Road)	Dissolved Oxygen	M
18	02040202110020-01	Cooper River NB(below Springdale Road)	Arsenic	M
18	02040202110020-01	Cooper River NB(below Springdale Road)	PCB	M
18	02040202110020-01	Cooper River NB(below Springdale Road)	DDT	M
18	02040202110020-01	Cooper River NB(below Springdale Road)	DDD	M
18	02040202110020-01	Cooper River NB(below Springdale Road)	DDE	M
18	02040202110030-01	Cooper River (above Evesham Road)	Total Dissolved Solids	L
18	02040202110030-01	Cooper River (above Evesham Road)	Turbidity	L
18	02040202110030-01	Cooper River (above Evesham Road)	Sulfate	L
18	02040202110030-01	Cooper River (above Evesham Road)	Arsenic	M
18	02040202110030-01	Cooper River (above Evesham Road)	Lead	M
18	02040202110030-01	Cooper River (above Evesham Road)	PCE	M
18	02040202110030-01	Cooper River (above Evesham Road)	PCB	M
18	02040202110030-01	Cooper River (above Evesham Road)	DDT	M
18	02040202110030-01	Cooper River (above Evesham Road)	DDD	M
18	02040202110030-01	Cooper River (above Evesham Road)	DDE	M
18	02040202110030-01	Cooper River (above Evesham Road)	Mercury	M
18	02040202110030-01	Cooper River (above Evesham Road)	TCE	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	Total Dissolved Solids	L
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	Turbidity	L
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	Sulfate	L
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	Arsenic	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	Lead	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	PCE	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	Chlordane	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	PCB	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	DDT	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	DDD	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	DDE	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	Mercury	M
18	02040202110040-01	Cooper R (Wallworth gage to Evesham Rd)	TCE	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	pH	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	Total Dissolved Solids	L
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	Turbidity	L
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	Sulfate	L
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	Arsenic	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	Lead	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	PCE	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	Mercury	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	Chlordane	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	PCB	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	DDT	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	DDD	M

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18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	DDE	M
18	02040202110050-01	Cooper River (Rt 130 to Wallworth gage)	TCE	M
18	02040202110060-01	Cooper River (below Rt 130)	pH	M
18	02040202110060-01	Cooper River (below Rt 130)	Arsenic	M
18	02040202110060-01	Cooper River (below Rt 130)	PCE	M
18	02040202110060-01	Cooper River (below Rt 130)	PCB	M
18	02040202110060-01	Cooper River (below Rt 130)	DDT	M
18	02040202110060-01	Cooper River (below Rt 130)	DDD	M
18	02040202110060-01	Cooper River (below Rt 130)	DDE	M
18	02040202110060-01	Cooper River (below Rt 130)	TCE	M
18	02040202120010-01	Big Timber Creek NB (above Laurel Rd)	Phosphorus	M
18	02040202120010-01	Big Timber Creek NB (above Laurel Rd)	Mercury	M
18	02040202120020-01	Big Timber Creek NB (below Laurel Rd)	Phosphorus	M
18	02040202120020-01	Big Timber Creek NB (below Laurel Rd)	Mercury	M
18	02040202120030-01	Big Timber Creek SB (above Lakeland Rd)	Phosphorus	M
18	02040202120030-01	Big Timber Creek SB (above Lakeland Rd)	Mercury	M
18	02040202120040-01	Big T Ck SB(incl Bull Run to LakelandRd)	Arsenic	M
18	02040202120040-01	Big T Ck SB(incl Bull Run to LakelandRd)	Mercury	M
18	02040202120050-01	Big Timber Creek SB (below Bull Run)	Phosphorus	M
18	02040202120050-01	Big Timber Creek SB (below Bull Run)	Mercury	M
18	02040202120050-01	Big Timber Creek SB (below Bull Run)	PCB	M
18	02040202120060-01	Almonesson Creek	Cause Unknown	L
18	02040202120060-01	Almonesson Creek	Mercury	M
18	02040202120060-01	Almonesson Creek	PCB	M
18	02040202120070-01	Little Timber Creek (Gloucester City)	Cause Unknown	L
18	02040202120070-01	Little Timber Creek (Gloucester City)	PCB	M
18	02040202120080-01	Big Timber Creek (below NB/SB confl)	Cause Unknown	L
18	02040202120080-01	Big Timber Creek (below NB/SB confl)	Mercury	M
18	02040202120080-01	Big Timber Creek (below NB/SB confl)	PCB	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	pH	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	Phosphorus	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	E. Coli	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	Arsenic	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	Copper	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	Mercury	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	Chlordane	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	PCB	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	DDT	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	DDD	M
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	DDE	M
18	02040202120100-01	Woodbury Creek (above Rt 45)	pH	M
18	02040202120100-01	Woodbury Creek (above Rt 45)	Mercury	M
18	02040202120100-01	Woodbury Creek (above Rt 45)	Chlordane	M
18	02040202120100-01	Woodbury Creek (above Rt 45)	PCB	M
18	02040202120100-01	Woodbury Creek (above Rt 45)	DDT	M
18	02040202120100-01	Woodbury Creek (above Rt 45)	DDD	M

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18	02040202120100-01	Woodbury Creek (above Rt 45)	DDE	M
18	02040202120110-01	Woodbury Ck (below Rt 45)/LDRV to B T Ck	pH	M
18	02040202120110-01	Woodbury Ck (below Rt 45)/LDRV to B T Ck	PCB	M
18	02040202120120-01	Main Ditch / Little Mantua Creek	PCB	M
18	02040202130010-01	Mantua Creek (above Rt 47)	Cause Unknown	L
18	02040202130030-01	Chestnut Branch (above Sewell)	Phosphorus	M
18	02040202130030-01	Chestnut Branch (above Sewell)	Mercury	M
18	02040202130040-01	Mantua Ck (Edwards Run to rd to Sewell)	pH	M
18	02040202130040-01	Mantua Ck (Edwards Run to rd to Sewell)	Phosphorus	M
18	02040202130040-01	Mantua Ck (Edwards Run to rd to Sewell)	E. Coli	M
18	02040202130040-01	Mantua Ck (Edwards Run to rd to Sewell)	Mercury	M
18	02040202130040-01	Mantua Ck (Edwards Run to rd to Sewell)	PCB	M
18	02040202130050-01	Edwards Run	Phosphorus	M
18	02040202130050-01	Edwards Run	Total Suspended Solids	L
18	02040202130050-01	Edwards Run	Turbidity	L
18	02040202130050-01	Edwards Run	E. Coli	M
18	02040202130050-01	Edwards Run	Arsenic	M
18	02040202130050-01	Edwards Run	PCB	M
18	02040202130060-01	Mantua Creek (below Edwards Run)	PCB	M
18	02040202140020-01	Still Run/London Br(above Tomlin Sta Rd)	Cause Unknown	L
18	02040202140030-01	Pargay Creek	Phosphorus	L
18	02040202140030-01	Pargay Creek	E. Coli	M
18	02040202140040-01	Moss Branch / Little Timber Ck (Repaupo)	Cause Unknown	L
18	02040202140040-01	Moss Branch / Little Timber Ck (Repaupo)	Mercury	M
18	02040202140040-01	Moss Branch / Little Timber Ck (Repaupo)	PCB	M
18	02040202140050-01	RepaupoCk(belowTomlin Sta Rd)/CedarSwamp	Mercury	M
18	02040202140050-01	RepaupoCk(belowTomlin Sta Rd)/CedarSwamp	PCB	M
18	02040202150010-01	Raccoon Ck (above Clems Run)	Cause Unknown	L
18	02040202150030-01	Raccoon Ck SB	Cause Unknown	L
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	Phosphorus	M
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	Turbidity	L
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	Arsenic	M
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	Silver	M
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	Mercury	M
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	Chlordane	M
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	PCB	M
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	DDT	M
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	DDD	M
18	02040202150040-01	Raccoon Ck (Russell Mill Rd to Rt 45)	DDE	M
18	02040202150050-01	Raccoon Ck (Swedesboro rd-RussellMillRd)	Cause Unknown	L
18	02040202150060-01	Raccoon Ck (below Swedesboro rd)/BirchCk	Phosphorus	M
18	02040202150060-01	Raccoon Ck (below Swedesboro rd)/BirchCk	Total Suspended Solids	L
18	02040202160020-01	Oldmans Creek (Rt 45 to Commissioners Rd)	Mercury	M
18	02040202160040-01	Beaver Creek (Oldmans Creek)	PCB	M
18	02040202160050-01	Oldmans Creek (Center Sq Rd to KingsHwy)	Total Suspended Solids	L
18	02040202160050-01	Oldmans Creek (Center Sq Rd to KingsHwy)	PCB	M

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18	02040202160060-01	Oldmans Creek (below Center Sq Rd)	PCB	M
17	02040204910010-01	Dl Bay(CapeMay Pt to Dennis Ck)inshore	Dissolved Oxygen	M
17	02040204910010-01	Dl Bay(CapeMay Pt to Dennis Ck)inshore	Enterococci	L
17	02040204910010-01	Dl Bay(CapeMay Pt to Dennis Ck)inshore	Mercury	M
17	02040204910010-01	Dl Bay(CapeMay Pt to Dennis Ck)inshore	PCB	M
17	02040204910010-01	Dl Bay(CapeMay Pt to Dennis Ck)inshore	DDT	M
17	02040204910010-01	Dl Bay(CapeMay Pt to Dennis Ck)inshore	DDD	M
17	02040204910010-01	Dl Bay(CapeMay Pt to Dennis Ck)inshore	DDE	M
17	02040204910010-02	Dl Bay(CapeMay Pt to Dennis Ck)offshore	Dissolved Oxygen	M
17	02040204910010-02	Dl Bay(CapeMay Pt to Dennis Ck)offshore	Mercury	M
17	02040204910010-02	Dl Bay(CapeMay Pt to Dennis Ck)offshore	PCB	M
17	02040204910010-02	Dl Bay(CapeMay Pt to Dennis Ck)offshore	DDT	M
17	02040204910010-02	Dl Bay(CapeMay Pt to Dennis Ck)offshore	DDD	M
17	02040204910010-02	Dl Bay(CapeMay Pt to Dennis Ck)offshore	DDE	M
17	02040204910020-01	Dl Bay(DennisCk to Egg Islnd Pt)inshore	Dissolved Oxygen	M
17	02040204910020-01	Dl Bay(DennisCk to Egg Islnd Pt)inshore	Enterococci	L
17	02040204910020-01	Dl Bay(DennisCk to Egg Islnd Pt)inshore	Mercury	M
17	02040204910020-01	Dl Bay(DennisCk to Egg Islnd Pt)inshore	PCB	M
17	02040204910020-01	Dl Bay(DennisCk to Egg Islnd Pt)inshore	DDT	M
17	02040204910020-01	Dl Bay(DennisCk to Egg Islnd Pt)inshore	DDD	M
17	02040204910020-01	Dl Bay(DennisCk to Egg Islnd Pt)inshore	DDE	M
17	02040204910020-01	Dl Bay(DennisCk to Egg Islnd Pt)inshore	Total Coliform	M
17	02040204910020-02	Dl Bay(DennisCk to Egg Islnd Pt)offshore	Dissolved Oxygen	M
17	02040204910020-02	Dl Bay(DennisCk to Egg Islnd Pt)offshore	Mercury	M
17	02040204910020-02	Dl Bay(DennisCk to Egg Islnd Pt)offshore	PCB	M
17	02040204910020-02	Dl Bay(DennisCk to Egg Islnd Pt)offshore	DDT	M
17	02040204910020-02	Dl Bay(DennisCk to Egg Islnd Pt)offshore	DDD	M
17	02040204910020-02	Dl Bay(DennisCk to Egg Islnd Pt)offshore	DDE	M
17	02040204910030-01	Dl Bay(Egg Is Pt to Cohansey R)Inshore	PCB	M
17	02040204910030-02	Dl Bay(Egg Is Pt to Cohansey R)Offshore	Dissolved Oxygen	M
17	02040204910030-02	Dl Bay(Egg Is Pt to Cohansey R)Offshore	PCB	M
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	Dissolved Oxygen	M
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	Total Coliform	L
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	Mercury	M
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	Chlordane	M
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	PCB	M
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	DDT	M
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	DDD	M
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	DDE	M
17	02040204910040-01	Delaware Bay (Cohansey R to FishingCk)	Dieldrin	M
17	02040206020010-01	LDRV tribs (Lakeview Ave to Oldmans Ck)	PCB	M
17	02040206020020-01	LDRV tribs (Marsh Pt-Main St Pennsville)	Mercury	M
17	02040206020020-01	LDRV tribs (Marsh Pt-Main St Pennsville)	PCB	M
17	02040206020020-01	LDRV tribs (Marsh Pt-Main St Pennsville)	DDT	M
17	02040206020020-01	LDRV tribs (Marsh Pt-Main St Pennsville)	DDD	M
17	02040206020020-01	LDRV tribs (Marsh Pt-Main St Pennsville)	DDE	M

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17	02040206030010-01	Salem River (above Woodstown gage)	pH	M
17	02040206030010-01	Salem River (above Woodstown gage)	Mercury	M
17	02040206030010-01	Salem River (above Woodstown gage)	Phosphorus	M
17	02040206030030-01	Salem R (CountyHomeRd to Woodstown gage)	pH	M
17	02040206030030-01	Salem R (CountyHomeRd to Woodstown gage)	Phosphorus	M
17	02040206030040-01	Salem R (CoursesLanding to CountyHomeRd)	Dissolved Oxygen	M
17	02040206030040-01	Salem R (CoursesLanding to CountyHomeRd)	pH	M
17	02040206030040-01	Salem R (CoursesLanding to CountyHomeRd)	Temperature	L
17	02040206030040-01	Salem R (CoursesLanding to CountyHomeRd)	Phosphorus	M
17	02040206030040-01	Salem R (CoursesLanding to CountyHomeRd)	Total Suspended Solids	L
17	02040206030040-01	Salem R (CoursesLanding to CountyHomeRd)	Arsenic	M
17	02040206030050-01	Game Creek (above Rt 48)	Phosphorus	M
17	02040206030060-01	Salem R (39-40-14 dam-CoursesLndg)/Canal	Temperature	L
17	02040206030060-01	Salem R (39-40-14 dam-CoursesLndg)/Canal	Phosphorus	M
17	02040206040010-01	Mannington Creek	Phosphorus	L
17	02040206040010-01	Mannington Creek	Arsenic	M
17	02040206040020-01	Fenwick Creek / Keasbeys Creek	PCB	M
17	02040206040030-01	Salem R (Fenwick Ck to 39d40m14s dam)	PCB	M
17	02040206040040-01	Salem R (below Fenwick Creek)	PCB	M
17	02040206060020-01	Alloway Ck (above Alloway-Woodstown Rd)	Phosphorus	M
17	02040206060020-01	Alloway Ck (above Alloway-Woodstown Rd)	Total Suspended Solids	L
17	02040206060020-01	Alloway Ck (above Alloway-Woodstown Rd)	Arsenic	M
17	02040206060040-01	Deep Run (Alloway)	Arsenic	M
17	02040206060050-01	Alloway Ck (Quinton to Alloway-WdstwnRd)	Cause Unknown	L
17	02040206060050-01	Alloway Ck (Quinton to Alloway-WdstwnRd)	PCB	M
17	02040206060060-01	Alloway Creek (New Bridge to Quinton)	PCB	M
17	02040206060070-01	Harmony trib (Alloway Creek)	PCB	M
17	02040206060080-01	Alloway Ck (HancocksBridge to NewBridge)	PCB	M
17	02040206060090-01	Alloway Ck (below HancocksBr) to Salem R	PCB	M
17	02040206060100-01	Hope Creek / Artificial Island	PCB	M
17	02040206070010-01	Fishing Creek / Bucks Ditch/Pattys Fork	PCB	M
17	02040206070020-01	Mad Horse Ck / Little Ck / Turners Fork	PCB	M
17	02040206070030-01	Canton Drain (above Maskell Mill)	pH	M
17	02040206070030-01	Canton Drain (above Maskell Mill)	Mercury	M
17	02040206070040-01	Canton Drain (below Maskell Mill)	Cause Unknown	L
17	02040206070040-01	Canton Drain (below Maskell Mill)	PCB	M
17	02040206070060-01	Stow Creek (Canton Road to Jericho Road)	PCB	M
17	02040206070070-01	Raccoon Ditch (Stow Creek)	Cause Unknown	M
17	02040206070070-01	Raccoon Ditch (Stow Creek)	PCB	M
17	02040206070080-01	Stow Creek (below Canton Rd)	PCB	M
17	02040206070090-01	Phillips Creek / Jacobs Creek	PCB	M
17	02040206080010-01	Cohansey River (above Beals Mill)	E. Coli	M
17	02040206080020-01	Cohansey R (incl HandsPond - Beals Mill)	Cause Unknown	L
17	02040206080020-01	Cohansey R (incl HandsPond - Beals Mill)	E. Coli	M
17	02040206080030-01	Parsonage Run / Foster Run	Cause Unknown	L
17	02040206080040-01	Cohansey R (incl Beebe Run to HandsPond)	Cause Unknown	L

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
17	02040206080040-01	Cohansey R (incl Beebe Run to HandsPond)	E. Coli	M
17	02040206080050-01	Cohansey R (incl CornwellRun - BeebeRun)	Cause Unknown	L
17	02040206080050-01	Cohansey R (incl CornwellRun - BeebeRun)	E. Coli	M
17	02040206080050-01	Cohansey R (incl CornwellRun - BeebeRun)	Mercury	M
17	02040206090010-01	Barrett Run (above West Ave)	Cause Unknown	L
17	02040206090020-01	Indian Fields Branch / Jackson Run	Cause Unknown	L
17	02040206090030-01	Cohansey R (Rocaps Run to Cornwell Run)	Cause Unknown	L
17	02040206090030-01	Cohansey R (Rocaps Run to Cornwell Run)	PCB	M
17	02040206090030-01	Cohansey R (Rocaps Run to Cornwell Run)	Mercury	M
17	02040206090050-01	Mill Creek (below Maple House Bk)	PCB	M
17	02040206090060-01	Cohansey R (75d15m to/incl Rocaps Run)	PCB	M
17	02040206090070-01	Cohansey R (75d17m50s to 75d15m)	PCB	M
17	02040206090080-01	Cohansey R (Greenwich to 75d17m50s)	Mercury	M
17	02040206090080-01	Cohansey R (Greenwich to 75d17m50s)	Chlordane	M
17	02040206090080-01	Cohansey R (Greenwich to 75d17m50s)	PCB	M
17	02040206090080-01	Cohansey R (Greenwich to 75d17m50s)	DDT	M
17	02040206090080-01	Cohansey R (Greenwich to 75d17m50s)	DDD	M
17	02040206090080-01	Cohansey R (Greenwich to 75d17m50s)	DDE	M
17	02040206090090-01	Pine Mount Creek	Cause Unknown	L
17	02040206090100-01	Cohansey R (below Greenwich)	Mercury	M
17	02040206090100-01	Cohansey R (below Greenwich)	Chlordane	M
17	02040206090100-01	Cohansey R (below Greenwich)	PCB	M
17	02040206090100-01	Cohansey R (below Greenwich)	DDT	M
17	02040206090100-01	Cohansey R (below Greenwich)	DDD	M
17	02040206090100-01	Cohansey R (below Greenwich)	DDE	M
17	02040206100010-01	Middle Marsh Ck (DrumboCk to Sea Breeze)	PCB	M
17	02040206100020-01	Bridges Sticks Creek / Ogden Creek	PCB	M
17	02040206100030-01	Back Creek (Sea Breeze Rd to Cedar Ck)	PCB	M
17	02040206100040-01	Cedar Creek (above Rt 553)	Mercury	M
17	02040206100050-01	Cedar Creek (below Rt 553)	PCB	M
17	02040206100060-01	Nantuxent Creek (above Newport Landing)	Cause Unknown	L
17	02040206100060-01	Nantuxent Creek (above Newport Landing)	PCB	M
17	02040206100070-01	Nantuxent Creek (below Newport Landing)	PCB	M
17	02040206110010-01	Newport Neck (Nantuxent to Beadons Ck)	PCB	M
17	02040206110020-01	Fortesque Ck / Fishing Ck / Straight Ck	PCB	M
17	02040206110030-01	Oranoaken Creek	PCB	M
17	02040206110040-01	Mill Creek (Dividing Creek)	PCB	M
17	02040206110050-01	Dividing Creek (above Mill Creek)	Dissolved Oxygen	M
17	02040206110050-01	Dividing Creek (above Mill Creek)	PCB	M
17	02040206110060-01	Dividing Creek (below Mill Creek)	Dissolved Oxygen	M
17	02040206110060-01	Dividing Creek (below Mill Creek)	PCB	M
17	02040206110070-01	New England Creek (Kenny Pt to Elder Pt)	PCB	M
17	02040206120010-01	Little Ease Run (above Academy Rd)	pH	M
17	02040206120020-01	Little Ease Run (below Academy Rd)	pH	M
17	02040206120030-01	Still Run (above Silver Lake Road)	Cause Unknown	L
17	02040206120050-01	Still Run (WillowGroveLk - SilverLakeRd)	Cause Unknown	L

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
17	02040206130010-01	Scotland Run (above Fries Mill)	Mercury	M
17	02040206130030-01	Indian Branch (Scotland Run)	E. Coli	M
17	02040206130040-01	Scotland Run (below Delsea Drive)	Mercury	M
17	02040206140010-01	MauriceR(BlkwtrBr to/incl WillowGroveLk)	Arsenic	M
17	02040206140010-01	MauriceR(BlkwtrBr to/incl WillowGroveLk)	Mercury	M
17	02040206140020-01	Burnt Mill Branch / Hudson Branch	Arsenic	M
17	02040206140040-01	Blackwater Branch (above/incl Pine Br)	Mercury	M
17	02040206140050-01	Blackwater Branch (below Pine Branch)	Mercury	M
17	02040206140060-01	Maurice R (Sherman Ave to Blackwater Br)	Arsenic	M
17	02040206140070-01	Parvin Branch / Tarkiln Branch	Cause Unknown	L
17	02040206150010-01	Muddy Run (above/incl Elmer Lake)	Cause Unknown	L
17	02040206150030-01	Palatine Branch (Muddy Run)	Cause Unknown	L
17	02040206150040-01	Indian Run (Muddy Run)	Cause Unknown	L
17	02040206160030-01	Maurice River(Union Lake to Sherman Ave)	Cause Unknown	L
17	02040206160030-01	Maurice River(Union Lake to Sherman Ave)	Arsenic	M
17	02040206160030-01	Maurice River(Union Lake to Sherman Ave)	Mercury	M
17	02040206170010-01	Hankins Pond trib (Millville)	PCB	M
17	02040206170020-01	White Marsh Run (Millville)	Cause Unknown	L
17	02040206170030-01	Maurice River(Menantico Ck to UnionLake)	Cause Unknown	L
17	02040206170030-01	Maurice River(Menantico Ck to UnionLake)	PCB	M
17	02040206170040-01	Buckshutem Creek (above Rt 555)	E. Coli	L
17	02040206170050-01	Buckshutem Creek (below Rt 555)	E. Coli	L
17	02040206170050-01	Buckshutem Creek (below Rt 555)	PCB	M
17	02040206180050-01	Menantico Creek (below Rt 552)	Phosphorus	M
17	02040206180050-01	Menantico Creek (below Rt 552)	E. Coli	M
17	02040206180050-01	Menantico Creek (below Rt 552)	Arsenic	M
17	02040206180050-01	Menantico Creek (below Rt 552)	PCB	M
17	02040206190030-01	Manumuskin River (below Rt 49)	PCB	M
17	02040206200010-01	Middle Branch / Slab Branch	Mercury	M
17	02040206200020-01	Muskee Creek	Mercury	M
17	02040206200020-01	Muskee Creek	PCB	M
17	02040206200030-01	Maurice River (Rt 548 to Menantico Ck)	PCB	M
17	02040206200040-01	Maurice River (Leesburg to Rt 548)	PCB	M
17	02040206200050-01	Maurice River (below Leesburg) to EastPt	Dissolved Oxygen	M
17	02040206200050-01	Maurice River (below Leesburg) to EastPt	Enterococci	L
17	02040206200050-01	Maurice River (below Leesburg) to EastPt	PCB	M
16	02040206210010-01	Riggins Ditch (Moores Beach to East Pt)	PCB	M
16	02040206210040-01	West Ck (below PaperMillRd) to MooresBch	Total Coliform	L
16	02040206210040-01	West Ck (below PaperMillRd) to MooresBch	PCB	M
16	02040206210050-01	Savages Run (above East Creek Pond)	Mercury	M
16	02040206210060-01	East Creek	Total Coliform	L
16	02040206210060-01	East Creek	Mercury	M
16	02040206210060-01	East Creek	PCB	M
16	02040206220010-01	Dennis Ck / Cedar Swamp(Rt 47 to Rt 550)	Dissolved Oxygen	M
16	02040206220010-01	Dennis Ck / Cedar Swamp(Rt 47 to Rt 550)	PCB	M
16	02040206220020-01	Sluice Creek	Total Coliform	M

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16	02040206220020-01	Sluice Creek	PCB	M
16	02040206220030-01	Dennis Creek (Jakes Landing Rd to Rt 47)	Dissolved Oxygen	M
16	02040206220030-01	Dennis Creek (Jakes Landing Rd to Rt 47)	Total Coliform	L
16	02040206220030-01	Dennis Creek (Jakes Landing Rd to Rt 47)	PCB	M
16	02040206220040-01	Dennis Creek (below Jakes Landing Rd)	Dissolved Oxygen	M
16	02040206220040-01	Dennis Creek (below Jakes Landing Rd)	Total Coliform	L
16	02040206220040-01	Dennis Creek (below Jakes Landing Rd)	PCB	M
16	02040206230010-01	Bidwell Creek (above Rt 47)	Dissolved Oxygen	M
16	02040206230010-01	Bidwell Creek (above Rt 47)	PCB	M
16	02040206230020-01	Bidwell Ck(below Rt 47)-Dias to GoshenCk	Dissolved Oxygen	M
16	02040206230020-01	Bidwell Ck(below Rt 47)-Dias to GoshenCk	PCB	M
16	02040206230030-01	Dias Creek	Dissolved Oxygen	M
16	02040206230030-01	Dias Creek	PCB	M
16	02040206230040-01	Green Ck (Norburys Landng to Pierces Pt)	Dissolved Oxygen	M
16	02040206230040-01	Green Ck (Norburys Landng to Pierces Pt)	Phosphorus	H
16	02040206230040-01	Green Ck (Norburys Landng to Pierces Pt)	Total Dissolved Solids	L
16	02040206230040-01	Green Ck (Norburys Landng to Pierces Pt)	PCB	M
16	02040206230050-01	Fishing Creek / Fishing Mill Stream	Cause Unknown	L
16	02040206230050-01	Fishing Creek / Fishing Mill Stream	PCB	M
16	02040206230060-01	Cox Hall Creek / Mickels Run (to Villas)	Dissolved Oxygen	M
16	02040206230060-01	Cox Hall Creek / Mickels Run (to Villas)	Turbidity	L
16	02040206230060-01	Cox Hall Creek / Mickels Run (to Villas)	PCB	M
16	02040206230060-01	Cox Hall Creek / Mickels Run (to Villas)	Enterococci	L
16	02040206230070-01	Pond Creek / Cape May Canal West	PCB	M
13	02040301020010-01	Metedeconk R NB(above I-195)	Dissolved Oxygen	M
13	02040301020010-01	Metedeconk R NB(above I-195)	Arsenic	M
13	02040301020020-01	Metedeconk R NB(Rt 9 to I-195)	Dissolved Oxygen	M
13	02040301020020-01	Metedeconk R NB(Rt 9 to I-195)	Temperature	L
13	02040301020020-01	Metedeconk R NB(Rt 9 to I-195)	Arsenic	M
13	02040301020030-01	Haystack Brook	Cause Unknown	L
13	02040301020040-01	Muddy Ford Brook	Phosphorus	M
13	02040301020040-01	Muddy Ford Brook	Total Suspended Solids	L
13	02040301020040-01	Muddy Ford Brook	Arsenic	M
13	02040301020040-01	Muddy Ford Brook	Mercury	M
13	02040301020050-01	Metedeconk R NB (confluence to Rt 9)	Temperature	L
13	02040301020050-01	Metedeconk R NB (confluence to Rt 9)	Arsenic	M
13	02040301040020-01	Metedeconk R (Beaverdam Ck to confl)	Cause Unknown	L
13	02040301030010-01	Metedeconk R SB (above I-195 exit 21 rd)	Arsenic	M
13	02040301030040-01	Metedeconk R SB (Rt 9 to Bennetts Pond)	Arsenic	M
13	02040301030040-01	Metedeconk R SB (Rt 9 to Bennetts Pond)	Mercury	M
13	02040301030050-01	Metedeconk R SB (confluence to Rt 9)	Arsenic	M
13	02040301040010-01	Beaverdam Creek	Cause Unknown	L
13	02040301040020-01	Metedeconk R (Beaverdam Ck to confl)	Arsenic	M
13	02040301040020-01	Metedeconk R (Beaverdam Ck to confl)	Enterococci	L
13	02040301040030-01	Metedeconk R (below Beaverdam Creek)	Dissolved Oxygen	M
13	02040301050010-01	Kettle Creek (above Lake Riviera outlet)	Cause Unknown	L

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
13	02040301050020-01	Kettle Creek (below Lake Riviera outlet)	Cause Unknown	L
13	02040301050050-01	Barnegat Bay North (above Rt 37 bridge)	Dissolved Oxygen	M
13	02040301050050-01	Barnegat Bay North (above Rt 37 bridge)	Enterococci	L
13	02040301060010-01	Toms River (above Francis Mills)	Phosphorus	M
13	02040301060010-01	Toms River (above Francis Mills)	PCB	M
13	02040301060020-01	Toms River (74-22-30 rd to FrancisMills)	pH	M
13	02040301060020-01	Toms River (74-22-30 rd to FrancisMills)	Temperature	L
13	02040301060030-01	Toms River (Bowman Rd to 74-22-30 road)	pH	M
13	02040301060030-01	Toms River (Bowman Rd to 74-22-30 road)	Temperature	L
13	02040301060050-01	Dove Mill Branch (Toms River)	Mercury	M
13	02040301060060-01	Toms River (Hope Chapel Rd to Bowman Rd)	PCB	M
13	02040301060080-01	Toms River (Oak Ridge Parkway to Rt 70)	PCB	M
13	02040301070010-01	Shannae Brook	pH	M
13	02040301070010-01	Shannae Brook	Mercury	M
13	02040301070030-01	Ridgeway Br (Hope Chapel Rd to HarrisBr)	Mercury	M
13	02040301070040-01	Ridgeway Br (below Hope Chapel Rd)	Mercury	M
13	02040301070080-01	Manapaqua Brook	E. Coli	M
13	02040301070080-01	Manapaqua Brook	Mercury	M
13	02040301070090-01	Union Branch (below Blacks Br 74d22m05s)	Mercury	M
13	02040301080030-01	Davenport Branch (above Pinewald Road)	Mercury	M
13	02040301080050-01	Wrangel Brook (below Michaels Branch)	Cause Unknown	L
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Arsenic	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Cadmium	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Chromium	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Copper	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Nickel	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Zinc	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Mercury	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Chlordane	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	PCB	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	DDT	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	DDD	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	DDE	M
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	Lead	M
13	02040301080070-01	Jakes Branch (Lower Toms River)	Dissolved Oxygen	M
13	02040301080090-01	Toms R Lwr (below Rt 166)	Arsenic	M
13	02040301080090-01	Toms R Lwr (below Rt 166)	Cadmium	M
13	02040301080090-01	Toms R Lwr (below Rt 166)	Chromium	M
13	02040301080090-01	Toms R Lwr (below Rt 166)	Copper	M
13	02040301080090-01	Toms R Lwr (below Rt 166)	Nickel	M
13	02040301080090-01	Toms R Lwr (below Rt 166)	Zinc	M
13	02040301080090-01	Toms R Lwr (below Rt 166)	Enterococci	M
13	02040301080090-01	Toms R Lwr (below Rt 166)	Lead	M
13	02040301090050-01	Cedar Creek (GS Parkway to 74d16m38s)	Mercury	M
13	02040301100030-01	Barnegat Bay Cntrl (Rt 37- Brngt Inlet)	Enterococci	M
13	02040301110010-01	Forked River NB(above old RR grade)	Dissolved Oxygen	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
13	02040301110010-01	Forked River NB(above old RR grade)	E. Coli	M
13	02040301130020-01	Mill Ck (above GS Parkway)	pH	M
13	02040301130030-01	Mill Ck (below GS Parkway)/Manahawkin Ck	pH	M
13	02040301130050-01	Westecunk Creek (above GS Parkway)	Mercury	M
13	02040301130060-01	Westecunk Creek (below GS Parkway)	Total Coliform	L
13	02040301130070-01	Dinner Point Creek & tribs	Total Coliform	L
14	02040301150010-01	Batsto River (above Hampton Gate)	pH	M
14	02040301150030-01	Indian Mills Brook / Muskingum Brook	pH	M
14	02040301150040-01	Springers Brook / Deep Run	pH	M
14	02040301150050-01	Batsto River (CNJRR to Hampton Gate)	pH	M
14	02040301150060-01	Batsto River (Quaker Bridge to CNJRR)	pH	M
14	02040301150080-01	Batsto R (Batsto gage to Quaker Bridge)	pH	M
14	02040301150080-01	Batsto R (Batsto gage to Quaker Bridge)	E. Coli	M
14	02040301150080-01	Batsto R (Batsto gage to Quaker Bridge)	Mercury	M
14	02040301160020-01	Mullica River (above Jackson Road)	Dissolved Oxygen	M
14	02040301160020-01	Mullica River (above Jackson Road)	pH	M
14	02040301160020-01	Mullica River (above Jackson Road)	Mercury	M
14	02040301160020-01	Mullica River (above Jackson Road)	PCB	M
14	02040301160020-01	Mullica River (above Jackson Road)	DDT	M
14	02040301160020-01	Mullica River (above Jackson Road)	DDD	M
14	02040301160020-01	Mullica River (above Jackson Road)	DDE	M
14	02040301160030-01	Mullica River (Rt 206 to Jackson Road)	Dissolved Oxygen	M
14	02040301160030-01	Mullica River (Rt 206 to Jackson Road)	Mercury	M
14	02040301160030-01	Mullica River (Rt 206 to Jackson Road)	PCB	M
14	02040301160030-01	Mullica River (Rt 206 to Jackson Road)	DDT	M
14	02040301160030-01	Mullica River (Rt 206 to Jackson Road)	DDD	M
14	02040301160030-01	Mullica River (Rt 206 to Jackson Road)	DDE	M
14	02040301160050-01	Hays Mill Creek (above Tremont Ave)	pH	M
14	02040301160060-01	Sleeper Branch (Rt 206 to Tremont Ave)	pH	M
14	02040301160070-01	Pump Branch (above 74d53m road)	pH	M
14	02040301160080-01	Pump Branch (below 74d53m road)	pH	M
14	02040301160100-01	Blue Anchor Brook	pH	M
14	02040301160100-01	Blue Anchor Brook	Temperature	L
14	02040301160110-01	Albertson Brook / Gun Branch	pH	M
14	02040301160120-01	Great Swamp Branch (above Rt 206)	pH	M
14	02040301160120-01	Great Swamp Branch (above Rt 206)	Temperature	L
14	02040301160120-01	Great Swamp Branch (above Rt 206)	Nitrate	M
14	02040301160130-01	Great Swamp Branch (below Rt 206)	pH	M
14	02040301160130-01	Great Swamp Branch (below Rt 206)	Nitrate	M
14	02040301160130-01	Great Swamp Branch (below Rt 206)	E. Coli	M
14	02040301160140-01	Mullica River (39d40m30s to Rt 206)	pH	M
14	02040301160140-01	Mullica River (39d40m30s to Rt 206)	Mercury	M
14	02040301160140-01	Mullica River (39d40m30s to Rt 206)	PCB	M
14	02040301160140-01	Mullica River (39d40m30s to Rt 206)	DDT	M
14	02040301160140-01	Mullica River (39d40m30s to Rt 206)	DDD	M
14	02040301160140-01	Mullica River (39d40m30s to Rt 206)	DDE	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
14	02040301160150-01	Mullica R (Pleasant Mills to 39d40m30s)	pH	M
14	02040301160150-01	Mullica R (Pleasant Mills to 39d40m30s)	Mercury	M
14	02040301160150-01	Mullica R (Pleasant Mills to 39d40m30s)	PCB	M
14	02040301160150-01	Mullica R (Pleasant Mills to 39d40m30s)	DDT	M
14	02040301160150-01	Mullica R (Pleasant Mills to 39d40m30s)	DDD	M
14	02040301160150-01	Mullica R (Pleasant Mills to 39d40m30s)	DDE	M
14	02040301170010-01	Hammonton Creek (above 74d43m)	pH	M
14	02040301170010-01	Hammonton Creek (above 74d43m)	Nitrate	M
14	02040301170010-01	Hammonton Creek (above 74d43m)	Arsenic	M
14	02040301170010-01	Hammonton Creek (above 74d43m)	Copper	M
14	02040301170010-01	Hammonton Creek (above 74d43m)	Zinc	M
14	02040301170010-01	Hammonton Creek (above 74d43m)	Mercury	M
14	02040301170010-01	Hammonton Creek (above 74d43m)	Phosphorus	H
14	02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	pH	M
14	02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	Nitrate	M
14	02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	Arsenic	M
14	02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	Copper	M
14	02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	Mercury	M
14	02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	Zinc	M
14	02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	Phosphorus	H
14	02040301170040-01	Mullica River (BatstoR to PleasantMills)	pH	M
14	02040301170040-01	Mullica River (BatstoR to PleasantMills)	E. Coli	M
14	02040301170040-01	Mullica River (BatstoR to PleasantMills)	Mercury	M
14	02040301170040-01	Mullica River (BatstoR to PleasantMills)	PCB	M
14	02040301170040-01	Mullica River (BatstoR to PleasantMills)	DDT	M
14	02040301170040-01	Mullica River (BatstoR to PleasantMills)	DDD	M
14	02040301170040-01	Mullica River (BatstoR to PleasantMills)	DDE	M
14	02040301170060-01	Mullica River (Rt 563 to Batsto River)	pH	M
14	02040301170060-01	Mullica River (Rt 563 to Batsto River)	Temperature	L
14	02040301170060-01	Mullica River (Rt 563 to Batsto River)	Phosphorus	M
14	02040301170060-01	Mullica River (Rt 563 to Batsto River)	Mercury	M
14	02040301170060-01	Mullica River (Rt 563 to Batsto River)	PCB	M
14	02040301170080-01	Mullica River (Lower Bank Rd to Rt 563)	pH	M
14	02040301170080-01	Mullica River (Lower Bank Rd to Rt 563)	Temperature	L
14	02040301170080-01	Mullica River (Lower Bank Rd to Rt 563)	Phosphorus	M
14	02040301170080-01	Mullica River (Lower Bank Rd to Rt 563)	Mercury	M
14	02040301170080-01	Mullica River (Lower Bank Rd to Rt 563)	PCB	M
14	02040301170090-01	Indian Cabin Creek	Dissolved Oxygen	M
14	02040301170100-01	Landing Creek (above Rt 563)	Dissolved Oxygen	M
14	02040301170100-01	Landing Creek (above Rt 563)	E. Coli	M
14	02040301170130-01	Mullica River(Turtle Ck to Lower BankRd)	Mercury	M
14	02040301170130-01	Mullica River(Turtle Ck to Lower BankRd)	PCB	M
14	02040301180010-01	Yellow Dam Branch	Dissolved Oxygen	M
14	02040301180020-01	Oswego River (above Rt 539)	Dissolved Oxygen	M
14	02040301180040-01	Oswego River (Sim Place Resv to Rt 539)	Dissolved Oxygen	M
14	02040301180070-01	Oswego River (below Andrews Road)	Mercury	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
14	02040301190050-01	Wading River WB (Jenkins Rd to Rt 563)	Dissolved Oxygen	M
14	02040301190050-01	Wading River WB (Jenkins Rd to Rt 563)	Mercury	M
14	02040301190070-01	Wading River WB (Oswego R to Jenkins Rd)	Mercury	M
14	02040301200010-01	Beaver Branch (Wading River)	Mercury	M
14	02040301200020-01	Wading River (Rt 542 to Oswego River)	Mercury	M
14	02040301200030-02	Wading River (below Rt 542)	Mercury	M
14	02040301200080-02	Mullica River (GSP bridge to Turtle Ck)	Mercury	M
14	02040301200080-02	Mullica River (GSP bridge to Turtle Ck)	PCB	M
14	02040301200110-02	Mattix Run (Nacote Creek)	Dissolved Oxygen	M
14	02040301200120-02	Nacote Creek (below/incl Mill Pond)	Dissolved Oxygen	M
14	02040301210010-02	Mullica River (below GSP bridge)	Mercury	M
14	02040301210010-02	Mullica River (below GSP bridge)	PCB	M
14	02040301210010-02	Mullica River (below GSP bridge)	Dissolved Oxygen	M
13	02040301910010-01	Atl Coast(Manasquan/Herring Is)inshore	Dissolved Oxygen	M
13	02040301910010-01	Atl Coast(Manasquan/Herring Is)inshore	Mercury	M
13	02040301910010-01	Atl Coast(Manasquan/Herring Is)inshore	PCB	M
13	02040301910010-01	Atl Coast(Manasquan/Herring Is)inshore	DDT	M
13	02040301910010-01	Atl Coast(Manasquan/Herring Is)inshore	DDD	M
13	02040301910010-01	Atl Coast(Manasquan/Herring Is)inshore	DDE	M
13	02040301910010-02	Atl Coast(Manasquan/Herring Is)offshore	Dissolved Oxygen	M
13	02040301910010-02	Atl Coast(Manasquan/Herring Is)offshore	Mercury	M
13	02040301910010-02	Atl Coast(Manasquan/Herring Is)offshore	PCB	M
13	02040301910010-02	Atl Coast(Manasquan/Herring Is)offshore	DDT	M
13	02040301910010-02	Atl Coast(Manasquan/Herring Is)offshore	DDD	M
13	02040301910010-02	Atl Coast(Manasquan/Herring Is)offshore	DDE	M
13	02040301910020-01	Atl Coast (Herring Is to Rt 37)inshore	Dissolved Oxygen	M
13	02040301910020-01	Atl Coast (Herring Is to Rt 37)inshore	Mercury	M
13	02040301910020-01	Atl Coast (Herring Is to Rt 37)inshore	PCB	M
13	02040301910020-01	Atl Coast (Herring Is to Rt 37)inshore	DDT	M
13	02040301910020-01	Atl Coast (Herring Is to Rt 37)inshore	DDD	M
13	02040301910020-01	Atl Coast (Herring Is to Rt 37)inshore	DDE	M
13	02040301910020-02	Atl Coast (Herring Is to Rt 37)offshore	Dissolved Oxygen	M
13	02040301910020-02	Atl Coast (Herring Is to Rt 37)offshore	Mercury	M
13	02040301910020-02	Atl Coast (Herring Is to Rt 37)offshore	PCB	M
13	02040301910020-02	Atl Coast (Herring Is to Rt 37)offshore	DDT	M
13	02040301910020-02	Atl Coast (Herring Is to Rt 37)offshore	DDD	M
13	02040301910020-02	Atl Coast (Herring Is to Rt 37)offshore	DDE	M
13	02040301910030-01	Atl Cst(Rt 37 to Barnegat Inlet)inshore	Dissolved Oxygen	M
13	02040301910030-01	Atl Cst(Rt 37 to Barnegat Inlet)inshore	Mercury	M
13	02040301910030-01	Atl Cst(Rt 37 to Barnegat Inlet)inshore	PCB	M
13	02040301910030-01	Atl Cst(Rt 37 to Barnegat Inlet)inshore	DDT	M
13	02040301910030-01	Atl Cst(Rt 37 to Barnegat Inlet)inshore	DDD	M
13	02040301910030-01	Atl Cst(Rt 37 to Barnegat Inlet)inshore	DDE	M
13	02040301910030-02	Atl Cst(Rt 37 to Barnegat Inlet)offshore	Dissolved Oxygen	M
13	02040301910030-02	Atl Cst(Rt 37 to Barnegat Inlet)offshore	Mercury	M
13	02040301910030-02	Atl Cst(Rt 37 to Barnegat Inlet)offshore	PCB	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
13	02040301910030-02	Atl Cst(Rt 37 to Barnegat Inlet)offshore	DDT	M
13	02040301910030-02	Atl Cst(Rt 37 to Barnegat Inlet)offshore	DDD	M
13	02040301910030-02	Atl Cst(Rt 37 to Barnegat Inlet)offshore	DDE	M
13	02040301920010-01	Atl Coast(Barnegat to Surf City)inshore	Dissolved Oxygen	M
13	02040301920010-01	Atl Coast(Barnegat to Surf City)inshore	Mercury	M
13	02040301920010-01	Atl Coast(Barnegat to Surf City)inshore	PCB	M
13	02040301920010-01	Atl Coast(Barnegat to Surf City)inshore	DDT	M
13	02040301920010-01	Atl Coast(Barnegat to Surf City)inshore	DDD	M
13	02040301920010-01	Atl Coast(Barnegat to Surf City)inshore	DDE	M
13	02040301920010-02	Atl Coast(Barnegat to Surf City)offshore	Dissolved Oxygen	M
13	02040301920010-02	Atl Coast(Barnegat to Surf City)offshore	Mercury	M
13	02040301920010-02	Atl Coast(Barnegat to Surf City)offshore	PCB	M
13	02040301920010-02	Atl Coast(Barnegat to Surf City)offshore	DDT	M
13	02040301920010-02	Atl Coast(Barnegat to Surf City)offshore	DDD	M
13	02040301920010-02	Atl Coast(Barnegat to Surf City)offshore	DDE	M
13	02040301920020-01	Atl Coast(Surf City to Haven Be)inshore	Dissolved Oxygen	M
13	02040301920020-01	Atl Coast(Surf City to Haven Be)inshore	Mercury	M
13	02040301920020-01	Atl Coast(Surf City to Haven Be)inshore	PCB	M
13	02040301920020-01	Atl Coast(Surf City to Haven Be)inshore	DDT	M
13	02040301920020-01	Atl Coast(Surf City to Haven Be)inshore	DDD	M
13	02040301920020-01	Atl Coast(Surf City to Haven Be)inshore	DDE	M
13	02040301920020-02	Atl Coast(Surf City to Haven Be)offshore	Dissolved Oxygen	M
13	02040301920020-02	Atl Coast(Surf City to Haven Be)offshore	Mercury	M
13	02040301920020-02	Atl Coast(Surf City to Haven Be)offshore	PCB	M
13	02040301920020-02	Atl Coast(Surf City to Haven Be)offshore	DDT	M
13	02040301920020-02	Atl Coast(Surf City to Haven Be)offshore	DDD	M
13	02040301920020-02	Atl Coast(Surf City to Haven Be)offshore	DDE	M
13	02040301920030-01	Atl Coast(Haven Bch to Lit Egg)inshore	Dissolved Oxygen	M
13	02040301920030-01	Atl Coast(Haven Bch to Lit Egg)inshore	Mercury	M
13	02040301920030-01	Atl Coast(Haven Bch to Lit Egg)inshore	PCB	M
13	02040301920030-01	Atl Coast(Haven Bch to Lit Egg)inshore	DDT	M
13	02040301920030-01	Atl Coast(Haven Bch to Lit Egg)inshore	DDD	M
13	02040301920030-01	Atl Coast(Haven Bch to Lit Egg)inshore	DDE	M
13	02040301920030-02	Atl Coast(Haven Bch to Lit Egg)offshore	Dissolved Oxygen	M
13	02040301920030-02	Atl Coast(Haven Bch to Lit Egg)offshore	Mercury	M
13	02040301920030-02	Atl Coast(Haven Bch to Lit Egg)offshore	PCB	M
13	02040301920030-02	Atl Coast(Haven Bch to Lit Egg)offshore	DDT	M
13	02040301920030-02	Atl Coast(Haven Bch to Lit Egg)offshore	DDD	M
13	02040301920030-02	Atl Coast(Haven Bch to Lit Egg)offshore	DDE	M
15	02040302020010-01	Absecon Creek NB	pH	M
15	02040302020010-01	Absecon Creek NB	Mercury	M
15	02040302020020-01	Absecon Creek SB	Mercury	M
15	02040302020030-01	Absecon Ck (AC Reserviors) (gage to SB)	Mercury	M
15	02040302020040-01	Absecon Creek (below gage)	Dissolved Oxygen	M
15	02040302020040-01	Absecon Creek (below gage)	Mercury	M
15	02040302030010-01	Great Egg Harbor R(above New Freedom Rd)	pH	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
15	02040302030020-01	GEHR (AC Expressway to New Freedom Rd)	pH	M
15	02040302030020-01	GEHR (AC Expressway to New Freedom Rd)	Mercury	M
15	02040302030040-01	GEHR (Broad Lane road to AC Expressway)	pH	M
15	02040302030040-01	GEHR (Broad Lane road to AC Expressway)	E. Coli	M
15	02040302030040-01	GEHR (Broad Lane road to AC Expressway)	Copper	M
15	02040302030050-01	Squankum Branch (GEHR)	pH	M
15	02040302030050-01	Squankum Branch (GEHR)	E. Coli	M
15	02040302030060-01	GEHR (Piney Hollow Rd to Broad Lane rd)	pH	M
15	02040302030060-01	GEHR (Piney Hollow Rd to Broad Lane rd)	Copper	M
15	02040302030070-01	Penny Pot Stream (GEHR)	pH	M
15	02040302030080-01	GEHR (Hospitality Br to Piney Hollow Rd)	pH	M
15	02040302030080-01	GEHR (Hospitality Br to Piney Hollow Rd)	Copper	M
15	02040302040010-01	Hospitality Branch (above Whitehouse Rd)	pH	M
15	02040302040020-01	Hospitality Br (Rt 538 to Whitehouse Rd)	pH	M
15	02040302040030-01	Hospitality Br (Piney HollowRd to Rt538)	pH	M
15	02040302040050-01	Collings Lakes trib (Hospitality Branch)	pH	M
15	02040302040050-01	Collings Lakes trib (Hospitality Branch)	Mercury	M
15	02040302040070-01	Hospitality Br (below Piney Hollow Rd)	pH	M
15	02040302040080-01	GEHR (39d32m50s to Hospitality Branch)	pH	M
15	02040302040080-01	GEHR (39d32m50s to Hospitality Branch)	Copper	M
15	02040302040090-01	GEHR (Rt 322 to 39d32m50s)	pH	M
15	02040302040090-01	GEHR (Rt 322 to 39d32m50s)	Copper	M
15	02040302040110-01	GEHR (Mare Run to Rt 322)	pH	M
15	02040302040110-01	GEHR (Mare Run to Rt 322)	Copper	M
15	02040302040120-01	Deep Run (GEHR)	pH	M
15	02040302040130-01	GEHR (Lake Lenape to Mare Run)	pH	M
15	02040302040130-01	GEHR (Lake Lenape to Mare Run)	Copper	M
15	02040302040130-01	GEHR (Lake Lenape to Mare Run)	Mercury	M
15	02040302050020-01	Babcock Creek (GEHR)	pH	M
15	02040302050030-01	South River (above 39d26m15s)	pH	M
15	02040302050040-01	South River (below 39d26m15s)	pH	M
15	02040302050060-01	GEHR (Miry Run to Lake Lenape)	Copper	M
15	02040302050060-01	GEHR (Miry Run to Lake Lenape)	Lead	M
15	02040302050060-01	GEHR (Miry Run to Lake Lenape)	Mercury	M
15	02040302050060-01	GEHR (Miry Run to Lake Lenape)	Zinc	M
15	02040302050060-01	GEHR (Miry Run to Lake Lenape)	Nickel	M
15	02040302050060-01	GEHR (Miry Run to Lake Lenape)	Cadmium	M
15	02040302050060-01	GEHR (Miry Run to Lake Lenape)	Arsenic	M
15	02040302050060-01	GEHR (Miry Run to Lake Lenape)	Chromium	M
15	02040302050080-01	Stephen Creek (GEHR)	pH	M
15	02040302050090-01	English Creek / Flat Ck / Cranberry Ck	Dissolved Oxygen	M
15	02040302050110-01	Lakes Creek (GEHR)	Dissolved Oxygen	M
15	02040302050120-01	Middle River / Peters Creek	Dissolved Oxygen	M
15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Dissolved Oxygen	M
15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Copper	M
15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Lead	M

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15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Mercury	M
15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Zinc	M
15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Nickel	M
15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Cadmium	M
15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Arsenic	M
15	02040302050130-01	Great Egg Harbor R (GEH Bay to Miry Run)	Chromium	M
15	02040302060020-01	Maple Run/Mill Br(Zion Rd to Cardiff rd)	Cause Unknown	L
15	02040302060030-01	Patcong Creek (Somers Ave to Zion Rd)	Dissolved Oxygen	M
15	02040302060040-01	GEH Bay/Lakes Bay/Skull Bay/Peck Bay	Dissolved Oxygen	M
15	02040302070010-01	Tuckahoe R (above Cumberland Ave)	pH	M
15	02040302070020-01	Tuckahoe R (39d19m52s to Cumberland Ave)	pH	M
15	02040302070040-01	Tuckahoe River (Rt 49 to 39d19m52s)	pH	M
15	02040302070110-01	Tuckahoe River (below Rt 49)	Dissolved Oxygen	M
16	02040302080010-01	Crook Horn Creek (above Devils Island)	Dissolved Oxygen	M
16	02040302080010-01	Crook Horn Creek (above Devils Island)	Total Coliform	L
16	02040302080030-01	Mill Creek / Sunks Ck / Big Elder Creek	Total Coliform	L
14	02040302910010-01	Atl Coast(Ltl Egg to Absecon In)inshore	Dissolved Oxygen	M
14	02040302910010-01	Atl Coast(Ltl Egg to Absecon In)inshore	Mercury	M
14	02040302910010-01	Atl Coast(Ltl Egg to Absecon In)inshore	PCB	M
14	02040302910010-01	Atl Coast(Ltl Egg to Absecon In)inshore	DDT	M
14	02040302910010-01	Atl Coast(Ltl Egg to Absecon In)inshore	DDD	M
14	02040302910010-01	Atl Coast(Ltl Egg to Absecon In)inshore	DDE	M
14	02040302910010-02	Atl Coast(Ltl Egg to Absecon In)offshore	Dissolved Oxygen	M
14	02040302910010-02	Atl Coast(Ltl Egg to Absecon In)offshore	Mercury	M
14	02040302910010-02	Atl Coast(Ltl Egg to Absecon In)offshore	PCB	M
14	02040302910010-02	Atl Coast(Ltl Egg to Absecon In)offshore	DDT	M
14	02040302910010-02	Atl Coast(Ltl Egg to Absecon In)offshore	DDD	M
14	02040302910010-02	Atl Coast(Ltl Egg to Absecon In)offshore	DDE	M
15	02040302920010-01	Atl Coast(Absecon In to Ventnor)inshore	Dissolved Oxygen	M
15	02040302920010-01	Atl Coast(Absecon In to Ventnor)inshore	Mercury	M
15	02040302920010-01	Atl Coast(Absecon In to Ventnor)inshore	PCB	M
15	02040302920010-01	Atl Coast(Absecon In to Ventnor)inshore	DDT	M
15	02040302920010-01	Atl Coast(Absecon In to Ventnor)inshore	DDD	M
15	02040302920010-01	Atl Coast(Absecon In to Ventnor)inshore	DDE	M
15	02040302920010-02	Atl Coast(Absecon In to Ventnor)offshore	Dissolved Oxygen	M
15	02040302920010-02	Atl Coast(Absecon In to Ventnor)offshore	Mercury	M
15	02040302920010-02	Atl Coast(Absecon In to Ventnor)offshore	PCB	M
15	02040302920010-02	Atl Coast(Absecon In to Ventnor)offshore	DDT	M
15	02040302920010-02	Atl Coast(Absecon In to Ventnor)offshore	DDD	M
15	02040302920010-02	Atl Coast(Absecon In to Ventnor)offshore	DDE	M
15	02040302920020-01	Atl Coast(Ventnor to Great Egg)inshore	Dissolved Oxygen	M
15	02040302920020-01	Atl Coast(Ventnor to Great Egg)inshore	Mercury	M
15	02040302920020-01	Atl Coast(Ventnor to Great Egg)inshore	PCB	M
15	02040302920020-01	Atl Coast(Ventnor to Great Egg)inshore	DDT	M
15	02040302920020-01	Atl Coast(Ventnor to Great Egg)inshore	DDD	M
15	02040302920020-01	Atl Coast(Ventnor to Great Egg)inshore	DDE	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
15	02040302920020-02	Atl Coast(Ventnor to Great Egg)offshore	Dissolved Oxygen	M
15	02040302920020-02	Atl Coast(Ventnor to Great Egg)offshore	Mercury	M
15	02040302920020-02	Atl Coast(Ventnor to Great Egg)offshore	PCB	M
15	02040302920020-02	Atl Coast(Ventnor to Great Egg)offshore	DDT	M
15	02040302920020-02	Atl Coast(Ventnor to Great Egg)offshore	DDD	M
15	02040302920020-02	Atl Coast(Ventnor to Great Egg)offshore	DDE	M
15	02040302930010-01	Atl Coast(Great Egg to 34th St)inshore	Dissolved Oxygen	M
15	02040302930010-01	Atl Coast(Great Egg to 34th St)inshore	Mercury	M
15	02040302930010-01	Atl Coast(Great Egg to 34th St)inshore	PCB	M
15	02040302930010-01	Atl Coast(Great Egg to 34th St)inshore	DDT	M
15	02040302930010-01	Atl Coast(Great Egg to 34th St)inshore	DDD	M
15	02040302930010-01	Atl Coast(Great Egg to 34th St)inshore	DDE	M
15	02040302930010-02	Atl Coast(Great Egg to 34th St)offshore	Dissolved Oxygen	M
15	02040302930010-02	Atl Coast(Great Egg to 34th St)offshore	Mercury	M
15	02040302930010-02	Atl Coast(Great Egg to 34th St)offshore	PCB	M
15	02040302930010-02	Atl Coast(Great Egg to 34th St)offshore	DDT	M
15	02040302930010-02	Atl Coast(Great Egg to 34th St)offshore	DDD	M
15	02040302930010-02	Atl Coast(Great Egg to 34th St)offshore	DDE	M
16	02040302940010-01	Atl Coast(34th St to Corson Inl)inshore	Dissolved Oxygen	M
16	02040302940010-01	Atl Coast(34th St to Corson Inl)inshore	Mercury	M
16	02040302940010-01	Atl Coast(34th St to Corson Inl)inshore	PCB	M
16	02040302940010-01	Atl Coast(34th St to Corson Inl)inshore	DDT	M
16	02040302940010-01	Atl Coast(34th St to Corson Inl)inshore	DDD	M
16	02040302940010-01	Atl Coast(34th St to Corson Inl)inshore	DDE	M
16	02040302940010-02	Atl Coast(34th St to Corson Inl)offshore	Dissolved Oxygen	M
16	02040302940010-02	Atl Coast(34th St to Corson Inl)offshore	Mercury	M
16	02040302940010-02	Atl Coast(34th St to Corson Inl)offshore	PCB	M
16	02040302940010-02	Atl Coast(34th St to Corson Inl)offshore	DDT	M
16	02040302940010-02	Atl Coast(34th St to Corson Inl)offshore	DDD	M
16	02040302940010-02	Atl Coast(34th St to Corson Inl)offshore	DDE	M
16	02040302940040-01	Atl Cst(Hereford to Cape May In)inshore	Dissolved Oxygen	M
16	02040302940040-01	Atl Cst(Hereford to Cape May In)inshore	Mercury	M
16	02040302940040-01	Atl Cst(Hereford to Cape May In)inshore	PCB	M
16	02040302940040-01	Atl Cst(Hereford to Cape May In)inshore	DDT	M
16	02040302940040-01	Atl Cst(Hereford to Cape May In)inshore	DDD	M
16	02040302940040-01	Atl Cst(Hereford to Cape May In)inshore	DDE	M
16	02040302940040-02	Atl Cst(Hereford to Cape May In)offshore	Dissolved Oxygen	M
16	02040302940040-02	Atl Cst(Hereford to Cape May In)offshore	Mercury	M
16	02040302940040-02	Atl Cst(Hereford to Cape May In)offshore	PCB	M
16	02040302940040-02	Atl Cst(Hereford to Cape May In)offshore	DDT	M
16	02040302940040-02	Atl Cst(Hereford to Cape May In)offshore	DDD	M
16	02040302940040-02	Atl Cst(Hereford to Cape May In)offshore	DDE	M
16	02040302940050-01	Atl Cst(CM Inlet to Cape May Pt)inshore	Dissolved Oxygen	M
16	02040302940050-01	Atl Cst(CM Inlet to Cape May Pt)inshore	Mercury	M
16	02040302940050-01	Atl Cst(CM Inlet to Cape May Pt)inshore	PCB	M
16	02040302940050-01	Atl Cst(CM Inlet to Cape May Pt)inshore	DDT	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
16	02040302940050-01	Atl Cst(CM Inlet to Cape May Pt)inshore	DDD	M
16	02040302940050-01	Atl Cst(CM Inlet to Cape May Pt)inshore	DDE	M
16	02040302940050-02	Atl Cst(CM Inlet to Cape May Pt)offshore	Dissolved Oxygen	M
16	02040302940050-02	Atl Cst(CM Inlet to Cape May Pt)offshore	Mercury	M
16	02040302940050-02	Atl Cst(CM Inlet to Cape May Pt)offshore	PCB	M
16	02040302940050-02	Atl Cst(CM Inlet to Cape May Pt)offshore	DDT	M
16	02040302940050-02	Atl Cst(CM Inlet to Cape May Pt)offshore	DDD	M
16	02040302940050-02	Atl Cst(CM Inlet to Cape May Pt)offshore	DDE	M
Zone 1	Delaware River 1	Delaware River 1C2	Arsenic	M
Zone 1	Delaware River 1	Delaware River 1C2	Chromium	M
Zone 1	Delaware River 1	Delaware River 1C2	Copper	M
Zone 1	Delaware River 1	Delaware River 1C2	Mercury	M
Zone 1	Delaware River 1	Delaware River 1C2	Chlordane	M
Zone 1	Delaware River 1	Delaware River 1C2	PCB	M
Zone 1	Delaware River 1	Delaware River 1C2	DDT	M
Zone 1	Delaware River 1	Delaware River 1C2	DDD	M
Zone 1	Delaware River 1	Delaware River 1C2	DDE	M
Zone 1	Delaware River 10	Delaware River 1E1	pH	M
Zone 1	Delaware River 10	Delaware River 1E1	Arsenic	M
Zone 1	Delaware River 10	Delaware River 1E1	Lead	M
Zone 1	Delaware River 10	Delaware River 1E1	Mercury	M
Zone 1	Delaware River 10	Delaware River 1E1	Chlordane	M
Zone 1	Delaware River 10	Delaware River 1E1	PCB	M
Zone 1	Delaware River 10	Delaware River 1E1	DDT	M
Zone 1	Delaware River 10	Delaware River 1E1	DDD	M
Zone 1	Delaware River 10	Delaware River 1E1	DDE	M
Zone 1	Delaware River 11	Delaware River 1E2	pH	M
Zone 1	Delaware River 11	Delaware River 1E2	Arsenic	M
Zone 1	Delaware River 11	Delaware River 1E2	Lead	M
Zone 1	Delaware River 11	Delaware River 1E2	Mercury	M
Zone 1	Delaware River 11	Delaware River 1E2	Chlordane	M
Zone 1	Delaware River 11	Delaware River 1E2	PCB	M
Zone 1	Delaware River 11	Delaware River 1E2	DDT	M
Zone 1	Delaware River 11	Delaware River 1E2	DDD	M
Zone 1	Delaware River 11	Delaware River 1E2	DDE	M
Zone 1	Delaware River 12	Delaware River 1E3	pH	M
Zone 1	Delaware River 12	Delaware River 1E3	Arsenic	M
Zone 1	Delaware River 12	Delaware River 1E3	Lead	M
Zone 1	Delaware River 12	Delaware River 1E3	Mercury	M
Zone 1	Delaware River 12	Delaware River 1E3	Chlordane	M
Zone 1	Delaware River 12	Delaware River 1E3	PCB	M
Zone 1	Delaware River 12	Delaware River 1E3	DDT	M
Zone 1	Delaware River 12	Delaware River 1E3	DDD	M
Zone 1	Delaware River 12	Delaware River 1E3	DDE	M
Zone 1	Delaware River 13	Delaware River 1E4	pH	M
Zone 1	Delaware River 13	Delaware River 1E4	Arsenic	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
Zone 1	Delaware River 13	Delaware River 1E4	Lead	M
Zone 1	Delaware River 13	Delaware River 1E4	Mercury	M
Zone 1	Delaware River 13	Delaware River 1E4	Chlordane	M
Zone 1	Delaware River 13	Delaware River 1E4	PCB	M
Zone 1	Delaware River 13	Delaware River 1E4	DDT	M
Zone 1	Delaware River 13	Delaware River 1E4	DDD	M
Zone 1	Delaware River 13	Delaware River 1E4	DDE	M
Zone 1	Delaware River 14	Delaware River 1E5	pH	M
Zone 1	Delaware River 14	Delaware River 1E5	Arsenic	M
Zone 1	Delaware River 14	Delaware River 1E5	Lead	M
Zone 1	Delaware River 14	Delaware River 1E5	Mercury	M
Zone 1	Delaware River 14	Delaware River 1E5	Chlordane	M
Zone 1	Delaware River 14	Delaware River 1E5	PCB	M
Zone 1	Delaware River 14	Delaware River 1E5	DDT	M
Zone 1	Delaware River 14	Delaware River 1E5	DDD	M
Zone 1	Delaware River 14	Delaware River 1E5	DDE	M
Zone 2	Delaware River 15	Delaware River 2	Temperature	L
Zone 2	Delaware River 15	Delaware River 2	Lead	M
Zone 2	Delaware River 15	Delaware River 2	Dieldrin	M
Zone 2	Delaware River 15	Delaware River 2	Mercury	M
Zone 2	Delaware River 15	Delaware River 2	Chlordane	M
Zone 2	Delaware River 15	Delaware River 2	PCB	M
Zone 2	Delaware River 15	Delaware River 2	DDT	M
Zone 2	Delaware River 15	Delaware River 2	DDD	M
Zone 2	Delaware River 15	Delaware River 2	DDE	M
Zone 3	Delaware River 16	Delaware River 3	Arsenic	M
Zone 3	Delaware River 16	Delaware River 3	Cadmium	M
Zone 3	Delaware River 16	Delaware River 3	Dieldrin	M
Zone 3	Delaware River 16	Delaware River 3	DDD	M
Zone 3	Delaware River 16	Delaware River 3	DDE	M
Zone 3	Delaware River 16	Delaware River 3	Mercury	M
Zone 3	Delaware River 16	Delaware River 3	Chlordane	M
Zone 3	Delaware River 16	Delaware River 3	PCB	M
Zone 3	Delaware River 16	Delaware River 3	DDT	M
Zone 4	Delaware River 17	Delaware River 4	Temperature	L
Zone 4	Delaware River 17	Delaware River 4	Copper	M
Zone 4	Delaware River 17	Delaware River 4	Dieldrin	M
Zone 4	Delaware River 17	Delaware River 4	DDD	M
Zone 4	Delaware River 17	Delaware River 4	DDE	M
Zone 4	Delaware River 17	Delaware River 4	Mercury	M
Zone 4	Delaware River 17	Delaware River 4	Chlordane	M
Zone 4	Delaware River 17	Delaware River 4	PCB	M
Zone 4	Delaware River 17	Delaware River 4	DDT	M
Zone 5	Delaware River 18	Delaware River 5A	Dissolved Oxygen	M
Zone 5	Delaware River 18	Delaware River 5A	Dieldrin	M
Zone 5	Delaware River 18	Delaware River 5A	Mercury	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
Zone 5	Delaware River 18	Delaware River 5A	Chlordane	M
Zone 5	Delaware River 18	Delaware River 5A	PCB	M
Zone 5	Delaware River 18	Delaware River 5A	DDT	M
Zone 5	Delaware River 18	Delaware River 5A	DDD	M
Zone 5	Delaware River 18	Delaware River 5A	DDE	M
Zone 5	Delaware River 19	Delaware River 5B	Dissolved Oxygen	M
Zone 5	Delaware River 19	Delaware River 5B	Dieldrin	M
Zone 5	Delaware River 19	Delaware River 5B	DDE	M
Zone 5	Delaware River 19	Delaware River 5B	Mercury	M
Zone 5	Delaware River 19	Delaware River 5B	Chlordane	M
Zone 5	Delaware River 19	Delaware River 5B	PCB	M
Zone 5	Delaware River 19	Delaware River 5B	DDT	M
Zone 5	Delaware River 19	Delaware River 5B	DDD	M
Zone 1	Delaware River 2	Delaware River 1C3	Arsenic	M
Zone 1	Delaware River 2	Delaware River 1C3	Chromium	M
Zone 1	Delaware River 2	Delaware River 1C3	Copper	M
Zone 1	Delaware River 2	Delaware River 1C3	Mercury	M
Zone 1	Delaware River 2	Delaware River 1C3	Chlordane	M
Zone 1	Delaware River 2	Delaware River 1C3	PCB	M
Zone 1	Delaware River 2	Delaware River 1C3	DDT	M
Zone 1	Delaware River 2	Delaware River 1C3	DDD	M
Zone 1	Delaware River 2	Delaware River 1C3	DDE	M
Zone 5	Delaware River 20	Delaware River 5C	Dissolved Oxygen	M
Zone 5	Delaware River 20	Delaware River 5C	Dieldrin	M
Zone 5	Delaware River 20	Delaware River 5C	Total Coliform	L
Zone 5	Delaware River 20	Delaware River 5C	Mercury	M
Zone 5	Delaware River 20	Delaware River 5C	Chlordane	M
Zone 5	Delaware River 20	Delaware River 5C	PCB	M
Zone 5	Delaware River 20	Delaware River 5C	DDT	M
Zone 5	Delaware River 20	Delaware River 5C	DDD	M
Zone 5	Delaware River 20	Delaware River 5C	DDE	M
Zone 1	Delaware River 3	Delaware River 1C4	Arsenic	M
Zone 1	Delaware River 3	Delaware River 1C4	Chromium	M
Zone 1	Delaware River 3	Delaware River 1C4	Copper	M
Zone 1	Delaware River 3	Delaware River 1C4	Mercury	M
Zone 1	Delaware River 3	Delaware River 1C4	Chlordane	M
Zone 1	Delaware River 3	Delaware River 1C4	PCB	M
Zone 1	Delaware River 3	Delaware River 1C4	DDT	M
Zone 1	Delaware River 3	Delaware River 1C4	DDD	M
Zone 1	Delaware River 3	Delaware River 1C4	DDE	M
Zone 1	Delaware River 4	Delaware River 1D1	Arsenic	M
Zone 1	Delaware River 4	Delaware River 1D1	Mercury	M
Zone 1	Delaware River 4	Delaware River 1D1	Chlordane	M
Zone 1	Delaware River 4	Delaware River 1D1	PCB	M
Zone 1	Delaware River 4	Delaware River 1D1	DDT	M
Zone 1	Delaware River 4	Delaware River 1D1	DDD	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
Zone 1	Delaware River 4	Delaware River 1D1	DDE	M
Zone 1	Delaware River 4	Delaware River 1D1	Chromium	M
Zone 1	Delaware River 4	Delaware River 1D1	Copper	M
Zone 1	Delaware River 5	Delaware River 1D2	Arsenic	M
Zone 1	Delaware River 5	Delaware River 1D2	Mercury	M
Zone 1	Delaware River 5	Delaware River 1D2	Chlordane	M
Zone 1	Delaware River 5	Delaware River 1D2	PCB	M
Zone 1	Delaware River 5	Delaware River 1D2	DDT	M
Zone 1	Delaware River 5	Delaware River 1D2	DDD	M
Zone 1	Delaware River 5	Delaware River 1D2	DDE	M
Zone 1	Delaware River 5	Delaware River 1D2	Chromium	M
Zone 1	Delaware River 5	Delaware River 1D2	Copper	M
Zone 1	Delaware River 6	Delaware River 1D3	Arsenic	M
Zone 1	Delaware River 6	Delaware River 1D3	Mercury	M
Zone 1	Delaware River 6	Delaware River 1D3	Chlordane	M
Zone 1	Delaware River 6	Delaware River 1D3	PCB	M
Zone 1	Delaware River 6	Delaware River 1D3	DDT	M
Zone 1	Delaware River 6	Delaware River 1D3	DDD	M
Zone 1	Delaware River 6	Delaware River 1D3	DDE	M
Zone 1	Delaware River 6	Delaware River 1D3	Chromium	M
Zone 1	Delaware River 6	Delaware River 1D3	Copper	M
Zone 1	Delaware River 7	Delaware River 1D4	Arsenic	M
Zone 1	Delaware River 7	Delaware River 1D4	Mercury	M
Zone 1	Delaware River 7	Delaware River 1D4	Chlordane	M
Zone 1	Delaware River 7	Delaware River 1D4	PCB	M
Zone 1	Delaware River 7	Delaware River 1D4	DDT	M
Zone 1	Delaware River 7	Delaware River 1D4	DDD	M
Zone 1	Delaware River 7	Delaware River 1D4	DDE	M
Zone 1	Delaware River 7	Delaware River 1D4	Chromium	M
Zone 1	Delaware River 7	Delaware River 1D4	Copper	M
Zone 1	Delaware River 8	Delaware River 1D5	Arsenic	M
Zone 1	Delaware River 8	Delaware River 1D5	Mercury	M
Zone 1	Delaware River 8	Delaware River 1D5	Chlordane	M
Zone 1	Delaware River 8	Delaware River 1D5	PCB	M
Zone 1	Delaware River 8	Delaware River 1D5	DDT	M
Zone 1	Delaware River 8	Delaware River 1D5	DDD	M
Zone 1	Delaware River 8	Delaware River 1D5	DDE	M
Zone 1	Delaware River 8	Delaware River 1D5	Chromium	M
Zone 1	Delaware River 8	Delaware River 1D5	Copper	M
Zone 1	Delaware River 9	Delaware River 1D6	Arsenic	M
Zone 1	Delaware River 9	Delaware River 1D6	Mercury	M
Zone 1	Delaware River 9	Delaware River 1D6	Chlordane	M
Zone 1	Delaware River 9	Delaware River 1D6	PCB	M
Zone 1	Delaware River 9	Delaware River 1D6	DDT	M
Zone 1	Delaware River 9	Delaware River 1D6	DDD	M
Zone 1	Delaware River 9	Delaware River 1D6	DDE	M

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
Zone 1	Delaware River 9	Delaware River 1D6	Chromium	M
Zone 1	Delaware River 9	Delaware River 1D6	Copper	M
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Dissolved Oxygen	L
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Dissolved Oxygen	L

Agency Responses to Public Comments on
The Draft 2008 List of Water Quality Limited Waters (2008 303(d) List)
July 2009

Commenters:

1. Clean Ocean Action (COA)
2. Great Swamp Watershed Association (GW)
3. Pequannock River Coalition (PRC)
4. Pinelands Commission (PC)
5. Pompeston Creek Watershed Association (PCWA)
6. Stony Brook Watershed Association (SBWA)
7. USEPA Region 2 (EPA)

Comments:

1. **Comment**: WMA designations are incorrect. (SBWA, EPA)

Response to Comment: The Department has corrected the Watershed Management Area (WMA) designations as listed on Appendix B.

2. **Comment**: Pompeston Creek should not be on Sublist 3 because Pompeston Creek Watershed Association is listed as a data generator and provided data for Pompeston Creek assessment units. (PCWA)

Response to Comment: The Department has re-evaluated the data for Pompeston Creek and revised the Integrated List and Final Integrated Report to reflect the data submitted by the Pompeston Creek Watershed Association. The final 2008 Integrated List was revised as follows: Pompeston Creek below Rt130/Swede to 40d (02040202090030-01) from Sublist 3 to Sublist 5 because data indicates that this assessment unit does not attain Recreation or Aquatic Life Uses because of *E. coli* and phosphorus, respectively.

3. **Comment**: Several waters located outside the Pinelands but within the buffer area were listed as attaining the Aquatic Life designated use. The stations associated with these waters are:

AN0149 North Branch Rancocas at Main Street
AN0170 Sharps Run at Route 541
AN0620 Great Egg Harbor R at Watsontown-New Freedom Road

These should be listed as not attaining the Aquatic Life Use (Sublist 5) because the PMI scored FAIR. (PC)

Response to Comment: The PMI applies to Pinelands (PL) waters contained within the jurisdictional boundary of the Pinelands as well as to fresh (FW2) waters located within five kilometers of the Pinelands Area boundary. As stated in the Methods Document,

"…for the new 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 nondegradation PL waters (emphasis added)." Since the sites identified by the commenter are located in FW2 waters, these waters were correctly assessed by the Department as not impaired and thus attaining the Aquatic Life Use. In addition, there was a typographical error on page 17 of the 2008 Integrated Water Quality Monitoring and Assessment Methods (Methods Document), which has been corrected to explain that the Pinelands Macroinvertebrate Index (PMI) is one of three new biological indices developed by the Department, based upon genus level taxonomy, to assess biological impairment in waters of the State.

4. **Comment**: Diurnal dissolved oxygen data were provided for 0203010307040 - West Brook Burnt Meadow Brook. It does not appear that these data were used to identify DO as a pollutant. (PRC)

Response to Comment: The Department re-evaluated the data for West Brook and agrees with the commenter. The Department has revised the assessment results for 02030103070040-01 (West Brook Burnt Meadow Brook) and the final 2008 Integrated List shows this assessment unit as not attaining the Aquatic Life Use Trout because of dissolved oxygen (Sublist 5).

5. **Comment:** In Appendix A, the assessment unit Loantaka Brook is on Sublist 5 for four designated uses: General Aquatic Life, Recreation, Drinking Water, and Agricultural Water Supply. Appendix B lists only two parameters that result in the impaired (Sublist 5) listings: fecal coliform/*E. coli* (which apply only to Recreation, according to Appendix F, the "Methods" document) and TDS (which applies to Aquatic Life and Agricultural Water). Please identify the pollutant for the Drinking Water Supply use.(GW)

6. **Comment**: Black Brook is listed in Sublist 5 for Aquatic Life, Drinking Water and Agricultural Water, with impairment attributed to DO and TDS. It is not clear why Drinking Water is in Sublist 5 since according to Appendix F, drinking water quality is not being associated with either DO or TDS. (GW)

Response to Comments 5 and 6: Appendix A of the 2008 Methods Document, which lists all the parameters the Department might use in the assessment process and the designated uses associated with each parameter, has been corrected to add TDS and delete TSS as parameters associated with the drinking water use.

7. **Comment**: Please clarify the TDS criterion regarding Agricultural Water Supply Use. Why does the 2000 mg/l TDS apply in this case and not the "No increase in background which would interfere with the designated or existing uses, or 500 mg/L, whichever is more stringent"? (GW)

Response to Comment: The TDS criterion in the SWQS of "No increase in background which would interfere with the designated or existing uses, or 500 mg/L, whichever is more stringent" was designed to protect the drinking (potable) water supply use. The Department has not established TDS criteria for protection of the agricultural water supply use and this use does not require the same level of protection from TDS as potable supplies. Therefore, for use assessment purposes, the Department established an assessment method for the agricultural water supply use based on available research on TDS. As explained in the 2006 Methods Document, acceptable levels for TDS and salinity were established as "at or below 2,000 mg/l" (Follet, 1999). If TDS or salinity data are not available, specific conductance is used as a surrogate with a specific conductance of 3,000 us/cm approximately equivalent to TDS and salinity levels of 2,000 mg/l (United Nations, 1985). The 2008 Methods Document has been revised to clarify the use of these guidance numbers.

8. **Comment**: Appendix F, page 29 states that if "surface water quality is such that more than conventional treatment is required" for Drinking Water Supply use, then "use is Not Attained"? Can you tell me what "conventional treatment" means here? (GW)

Response to Comment: Conventional treatment is defined in the Surface Water Quality Standards rules at N.J.A.C. 7:9B-1.12 (b)3 as " … a series of processes including filtration, flocculation, coagulation, and sedimentation, resulting in substantial particulate removal but no consistent removal of chemical constituent(s) or disinfection." When treatment other than conventional is required to remove naturally occurring constituents, such as arsenic, this additional treatment will not be used to assess the drinking water supply use since naturally occurring concentrations above the criteria are not considered to be exceedances pursuant to the SWQS rules.

9. **Comment**: Great Brook, both above and below Green Village Rd, is on Sublist 5 only for Aquatic Life - "Cause Unknown". Please confirm this finding is based on a poor MIV index found at the DEP's AMNET sites, with no chemical data to identify a cause. (GW)

Response to Comment: Both Great Brook above Green Village Road and Great Brook below Green Village Rd were assessed as not attaining the Aquatic Life Use due to "cause unknown" (Sublist 5). These assessment results were based solely on AMNET data. If chemical data were available indicating an exceedance of a pollutant associated with the Aquatic Life Use, then that pollutant would have been identified as the cause of non-attainment of the use.

10. **Comment**: The Upper Passaic River above Osborn Mills is on Sublist 5 for Phosphorus. What data were used for this listing? (GW)

Response to Comment: The Department collected phosphorus data for Ledell's Pond located in the Upper Passaic River above the Osborn Mills assessment unit. Two of four samples collected exceeded the phosphorus criterion.

11. **Comment**: The Upper Passaic River below Osborn Mills is impaired for Aquatic Life and Drinking Water Supply Uses and the pollutants are listed as arsenic, cyanide, and

Cause Unknown. Is Cause Unknown based on AMNET data and arsenic and cyanide attributed to USGS data? (GW)

Response to Comment: Cause unknown reflects the results of the Ambient (biological) Monitoring Network (AMNET) data. Arsenic data were collected by the Department while cyanide was "carried over" from the 1998 303(d) List based on much older data that was collected by either the Department or the Department and USGS. Although the Department has recently collected new cyanide data, the new data does not meet the data requirements to support delisting.

12. **Comment**: The commenter appreciates the Department's recognizing the value of volunteer-collected data and using them to reassign Loantaka Brook from Sublist 3 to Sublist 5 for several designated uses. (GW)

Response to Comment: The Department appreciates the commenter's support and intends to continue working with volunteer organizations to provide additional monitoring data that meet the Department's data quality requirements. The Department will continue to use such data as appropriate to assess the quality of New Jersey's waters.

13. **Comment**: Hudson River HUC 02030101170010-01 is both delisted and listed in 2008 for "cause unknown." Please confirm which it should be. (EPA)

Response to Comment: Hudson River HUC 02030101170010-01 was listed on Appendix A as not attaining the Aquatic Life use and was correctly listed for "cause unknown" on the 2008 303(d) List (Appendix B of the Integrated Report). This assessment unit/pollutant combination has been removed from Appendix C, "Draft New Jersey's 2008 Integrated Report Delisting Document", since the delisting was in error.

14. **Comment**: These two HUCs 02030104920010-01 and 02030104920010-02 are identified as impaired for the shellfish harvest use. Total coliform is not listed on the 303(d) List. The pathogens delisting, which we assume is *Enterococci* for recreation use, for the Atlantic Coast (Sandy Hook to Navesink River) is inappropriate and should remain on the 303(d) list. (EPA, COA)

Response to Comment: These assessment units were incorrectly listed as Sublist 5 on Appendix A and correctly listed on Appendix C as delisted for pathogens, which is why these assessment units were not listed on Appendix B. Upon further review, the Department determined that a TMDL was approved for these waters in September 2006. However, the TMDL concluded that these waters were not impaired and the water quality standards were met. Based on the approved TMDL for total coliform for the Atlantic Coast (Sandy Hook to Navesink River) the following revisions were made to the 2008 Integrated Report: 1) the 2008 Integrated List (Appendix A) was revised to reassign assessment units 02030104920010-01 and 02030104920010-02 from Sublist 5 to Sublist 2. No change was needed to Appendix B or C as these assessment units were correctly listed in Appendix C as delisted from the 2006 303(d) based on delisting code of 1-Meets SWQS.

15. **Comment**: The Dead River is identified in 2008 as being impaired for aquatic life yet there are no associated pollutants on the 303(d) list (EPA).

Response to Comment: The Dead River above (02030103010080-01) and below (02030103010100-01) Harrison's Brook are both on the 2008 303(d) List for total suspended solids.

16. **Comment**: HUC 02030103100010-01 Ramapo R. (above 74d) should be delisted for phosphorus as there is a TMDL in place. HUC 02030103150030-01 Passaic R Lwr (Second R to Saddle R) should not be delisted for phosphorus, as there is no TMDL in place. (EPA)

Response to Comment: The Department agrees with the commenter, in part. The 2008 Integrated Report has been revised to show Assessment Unit 02030103100010-01 as delisted for total phosphorus (Appendix C); removed from the 2008 303(d) List for this parameter (Appendix B); however, this assessment unit remains on Sublist 5 as not attaining the Aquatic Life Use – General and Trout for "cause unknown" due to biological impairment. However, while there is no TMDL for Assessment Unit 02030103150030-01, the 2008 delisting of this assessment unit for total phosphorus is correct since this waterbody is tidal (saline estuary, or "SE") and therefore not subject to the Surface Water Quality Standards criteria for total phosphorus, which apply only to freshwaters. Since the Surface Water Quality Standards do not contain any total phosphorus criteria for tidal waters, the 2006 303(d) Listing of this assessment unit for total phosphorus was in error.

17. **Comment**: The fish consumption method should explain that when there are site-specific fish advisories, the HUC will be placed on the 303(d) List with the pollutants identified in the fish advisory which had monitoring data. (EPA)

Response to Comment: Section 6.3 of the 2008 Methods Document has been revised to include the following statement: " … the assessment unit will be placed on the 303(d) List along with all pollutants responsible for the site-specific consumption advisory(ies)."

18. **Comment**: Please add in the Methods Document that an assessment unit/pollutant impairment that is already identified on the 303(d) List based on data older than five years will remain on the 303(d) List and will not be delisted due to the age of the data. (EPA)

Response to Comment: The Department does not agree that it is necessary to revise the Methods Document as suggested. The Department's reasons for delistings are described in Section 7.3 of the 2008 Methods Document and do not include delisting based solely on the age of the data. Data age is addressed specifically in Section 3.1 (Data Quality) of the 2008 Methods Document, which states:

> The Department will use the most recent five years of readily available data. Data … that is more than five years old may be used on a case-by-case

> basis. …The Department may disregard data less than five years old if newer data was collected or analyzed using scientific methods that are more precise.

19. **Comment**: The Methods document suggests that the geographic coverage of impaired shellfish harvesting areas will always be changing. Please discuss how the Department will track the geographic extent of these impaired waters if they do not conform to the standard delineation methodology. (EPA)

Response to Comment: All assessment units are delineated in accordance with the Methods Document and are the same for all designated uses. The assessment unit and the geographic area attributed to that assessment unit will not change from cycle to cycle. The 2008 Methods Document (Section 6.4 - Shellfish Harvest Use Assessment Method) explains that the shellfish harvest use is designated in all waters classified as SC and SE1and that the Department classifies all waters designated for shellfish harvest annually based on sampling data and assessment procedures outlined by the National Shellfish Sanitation Program. Waters are classified under NSSP as approved ("unrestricted"), special restricted, seasonal, or prohibited harvest. Maps of the actual classifications are published at N.J.A.C. 7:12.

The Department uses the classification status to determine whether the shellfish designated use is impaired within the assessment unit. Any given assessment unit may contain waters having more than one classification type (i.e., 700 acres fully approved and 10 acres seasonally restricted.) In Section 5 (Evaluating Data from Multiple Stations within an assessment unit, "*De Minimus*"), the Methods Document explains that assessment units overlie but may not follow shellfish classification boundaries exactly and each assessment unit may contain more than one classification. Classification areas are determined by grouping stations with similar water quality. Therefore, when data changes for one or more stations, the classification boundary changes. Therefore, while the assessment unit boundaries are fixed, the areas with a specific shellfish classification may change over time. Using the example above, the assessment unit may change to contain 600 acres approved and 110 acres seasonally restricted. Since the Department's assessment units do not change from cycle to cycle, the Department does not see the need for any additional tracking of "the geographic extent of these [shellfish harvest] impaired waters" beyond the listing and delisting process applied to all assessment units through the Integrated Report.

20. **Comment**: Please include in the Methods document the method for extrapolating assessment decisions to AUs without their own monitoring stations. (EPA)

Response to Comment: Section 5.0 (Evaluating Data from Multiple Stations within an Assessment Unit) of the 2008 Methods Document has been revised to explain in detail the methods for extrapolating data from stations to assessment units under various circumstances, including when an assessment unit contains no monitoring stations. In this instance, the Department would evaluate adjacent station locations and determine if the data from these stations should be used in assessing the adjacent assessment unit. In making this determination, the Department would consider significant tributaries, impoundments, or other hydrological alterations, as well as land use and major roads that could impact water quality between the monitoring site and the neighboring assessment unit.

21. **Comment**: The regulations at 40 CFR170.7 require threatened waters to be included in the state's Section 303(d) List. The 2008 Methods Document places threatened waters in the Department's assessment categories yet there is no method to assess threatened waters in the State's methodology. The 2006 Methods Document contained the assessment methods for threatened waters. Please provide the specifics for identifying threatened waters for the 2008 Section 303(d) List (EPA).

Response to Comment: The 2008 Methods Document has been revised to include the language from the 2006 Methods Document for assessing threatened waters.

22. **Comment**: The footnote to the Methods Document Table 6.5 states, "Since human health concerns from bioaccumulated constituents are generally addressed through consumption advisories, the Department will review exceedances of human health criteria for such constituents to determine which use is not being attained: the drinking water use, the fish consumption use, or both." Since the human health criteria for toxics are set at levels to be protective of human health from both ingestion of water and fish consumption, any exceedance of these Surface Water Quality Standards criteria should be identified as impairing the "drinking water supply" use. The Department may want to change the name of this designated use to better characterize the condition when there are exceedances of the saline human health criteria. (EPA)

Response to Comment: The Department included a footnote in the Drinking Water Use Assessment – Table 6.5 to address the concern that assessments are made based on a comparison of the ambient water quality to the human health criteria. New Jersey's human health criteria are developed in accordance with the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (USEPA, 2000). These criteria protect the public from two exposure pathways – the consumption of drinking water and the consumption of fish. Since chemical concentrations may increase in aquatic organisms at each successive trophic level due to increasing dietary exposures (e.g., increasing concentrations from algae, to zooplankton, to forage fish, to predatory fish), a bioaccumulation factor is used to protect the public from unacceptable human health risks from fish and shellfish consumption even when concentrations in water are too low to cause unacceptable health risks from drinking water consumption alone. Based upon this premise, the Department included this footnote to explain that the drinking water use could be assessed as attained even where chemicals with high bioaccumulation factors were present if the ambient concentration was too low to cause unacceptable risks to drinking water. However, if the ambient levels exceed the allowable level based on drinking water exposure alone, both fish consumption and drinking water uses would be assessed as not attained.

23. **Comment**: The 2008 Methods Document states:

> Once the data are reviewed and deemed appropriate for use in generating the Integrated List, the data for each parameter sampled at a specific monitoring station are evaluated for compliance with the [surface water quality standards] SWQS. Any samples that do not comply with the applicable numeric SWQS criteria are considered excursions and are further reviewed to determine if noncompliance can be attributed *to a less than minimum data set,* deficiencies in analytical precision or accuracy, natural conditions, transient events, or flow conditions that do not represent design flows. Excursions that can be attributed to any of these conditions are not evaluated further.

This method should be amended to explain that if the data in a "less than minimum [size] dataset" at the station-level demonstrate an exceedance of any WQS, then those data will be considered exceedances for Section 303(d) Listing purposes. The lack of sufficient data points from a station may be considered inadequate to demonstrate WQS attainment, but the existing data points must be used if non-attainment is shown. Please provide the details for any instance where data points indicating a potential exceedance were not used in an assessment because the minimum dataset was not met at the station-level. (EPA)

Response to Comment: The 2008 Methods Document was revised to add the following language to Section 4.1 (Physical and Chemical Data, "Minimum Number of Samples"): "In cases where less than the minimum dataset is available but the data that is available is representative of the overall water quality, consistent with quality objectives, and represents at least two exceedances of the Surface Water Quality Standards, this limited data set will be used to determine that a use is not attained. The data is insufficient to determine that the use is attained."

24. **Comment**: "Each State shall provide documentation to the Regional Administrator to support the State's determination to list or not to list its waters as required by Sec. Sec. 130.7(b)(1) and 130.7(b)(2). This documentation shall be submitted to the Regional Administrator together with the list required by Sec. Sec. 130.7(b)(1) and 130.7(b)(2) and shall include at a minimum a description of the data and information used to identify waters". Appendix F "Data Sources" must include a description of the data supplied by each of the entities supplying data and should include parameter name, location, and time period. (EPA)

Response to Comment: An expanded version of the Data Sources table (Appendix E) has been posted on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/support_docs.htm. Appendix E identifies the waterbodies, parameters, and time period for all data submitted pursuant to the Department's data solicitation and if this information was used by the Department for the 2008 Integrated Report. Additional information about specific data sets may be obtained from the data providers using the contact information in the Appendix E - Data Sources table.

25. **Comment**: Appendix E states that IEC data was both used and not used. Please explain. (EPA)

Response to Comment: Interstate Environmental Commission (IEC) data from the year 2000 to 2004 was used for the 2006 Integrated Report, including the 2006 Integrated List and 2006 303(d) List. Since the 2006 Integrated List serves as the basis for the 2008 Integrated List, all data and assessments for the 2006 Integrated Report (including the IEC data from 2000 to 2004) were considered for the 2008 Integrated Report. The Department was not able to utilize IEC data collected between 2005 and 2006 because the IEC did not submit their data in a format that was readily usable by the Department during the data solicitation period. The Department had publicly announced its data solicitation period, which extended from February 20, 2007 to August 5, 2007. To facilitate the compilation of data from numerous organizations, the Department directed data providers to use STORET or an Excel/Access-compatible data submittal template posted on the Department's Web site for submitting data. IEC did not use this template nor was their data available through STORET during the data solicitation period. As explained in the Department's data solicitation notice, the 2008 Methods Document, and consistent with EPA Guidance, the Department will use only data that is high quality, quality controlled, publicly available, submitted in the correct electronic format, and submitted within the data solicitation period. Since the IEC's data from 2005 and 2006 did not comply with these requirements, it was not used for the 2008 Integrated Report.

26. **Comment**: The methods document identifies several situations in which the assessment decision may be made by applying best professional judgment when analyzing specific data. These situations include (1) when the frequency of exceedance in a large dataset is considered, (2) when natural conditions would indicate attainment when the method would otherwise indicate impairment, (3) excluding sample results as not being representative of the normal range of water quality, (4) not using "*de minimis*" areas of impairment in an assessment decision of non-attainment to a larger area, and (5) when conflicting datasets are evaluated and one is given more weight over another. Please identify and discuss all instances in which any water was not placed on the CWA 303(d) list based on applying best professional judgment to the case-specific assessment and therefore the standard assessment method for that situation was not used. (EPA)

Response to Comment: The 2008 Methods Document attributes only the first and fourth instances cited by the commenter to "best professional judgment". Situation 1) "when the frequency of exceedance in a large dataset is considered" is addressed in Section 4.1 of the Methods Document, which states: "When the minimum exceedance is met but the dataset is very large (more than 30 data points), the Department will consider the relative frequency and magnitude of the exceedances within the dataset and use **Best Professional Judgment** to determine if they represent non-attainment of the designated use. The Integrated Report will include an explanation of any assessment which concludes that the use is attained because of relatively low magnitude or frequency of exceedances in a very large dataset." Situation 4) "not using '*de minimis*' areas of impairment in an assessment decision of non-attainment to a larger area" is addressed in

Section 5.0 of the Methods Document, under "De Minimus", which states: In these instances, where the Department uses **Best Professional Judgment** and determines that the impairment is *de minimus*, the individual impaired bathing beaches will be identified in the Integrated Report for follow up sanitary surveys required by the DHSS. In Section 6.2 Recreational Use Assessment, the Methods Document also states: the Department uses **Best Professional Judgment** and determines that the impaired beach area is *de minimus* for the assessment unit, the assessment unit will be assessed as attaining the primary contact recreational use and the *de minimus* impaired beach will be identified in the Integrated Report for follow up sanitary surveys required by the DHSS. (See Section 5.1 for a more detailed explanation of *de minimus* data.) These are the only assessment situations defined in the Methods Document as "Best Professional Judgment". The Department has added Table 4.8-2 to the final 2008 Integrated Report, which lists all Best Professional Judgment decisions made for the 2008 Integrated Report.

The other situations identified in the comment are not considered to be "Best Professional Judgment" because the method for assessing data in those situations is expressly provided elsewhere in the Methods Document. Situation 2) "when natural conditions would indicate attainment when the method would otherwise indicate impairment" is addressed in Section 3.2 of the 2008 Methods Document, which explains how the SWQS provisions for natural conditions are implemented: "Data that do not meet applicable SWQS criteria potentially due to natural conditions will be carefully evaluated. When the Department identifies a general area where natural conditions apply, it will discuss the assessment process in the Methods Document as it does earlier in Section 1.2 for low pH in the Coastal Plain area. Where natural conditions are used for a specific station and parameter, the Integrated Report will identify these instances and describe the rational for this decision." The Department identified the Southern Coastal Plain waters as exhibiting naturally-occurring low pH levels, as explained in Section 1.2 of the Methods Document.

Situation 3), "excluding sample results as not being representative of the normal range of water quality" is addressed in Chapter 4 of the Methods Document under "Outliers", which explains that "Any data that is identified as an outlier in accordance with the corresponding QAPP is not considered a valid result and is not used in for assessment purposes." Situation 5) "when conflicting datasets are evaluated and one is given more weight over another" is addressed in Chapter 5 of the Methods Document, "Evaluating Contradictory Data Sets", which explains that when conflicting datasets are evaluated one is given more weight over another, as follows.

> Weighing data is necessary when evaluating numerous data sets that have different data collection and analysis methods, or have temporal or spatial sampling variability. These decisions will apply in the following situations: newer data will override older data; larger data collection sets might override or be combined with nominal data sets; and higher quality data will override data sets of lower quality based on sampling protocol, equipment, training and experience of samplers, quality control program, and lab and analytical procedures. If the Department bases its use assessment on one set

of data over another, the specific rationale applied will be explained in the Integrated Report.

The Department has deleted the last sentence of the paragraph above from the Methods Document since this type of assessment decision is more appropriately documented as a notation in the USEPA Assessment Tracking Database and shall be entered by the Department as such. All delisting decisions made by the Department based on the above situations and their applicable assessment methods are noted in the 2008 Delisting Document (Appendix C of the 2008 Integrated Report) using the appropriate USEPA Delisting Code, as explained in Section 7.3 of the Methods Document.

27. **Comment**: Section 1.2 of the Methods documents states that "a list of lakes and their corresponding HUC assessment units will be provided in the Integrated Report." This list currently does not appear in the Integrated Report. (EPA)

28. **Comment**: Section 1.2 of the 2008 Methods Document ("Lakes") should state that when the more stringent numeric surface water quality criterion for total phosphorus in lakes is exceeded, the entire HUC will be listed as not attaining the designated use for phosphorus. In addition, if the lake-specific assessments presented in the 2006 Methods Document will be used in 2008, then these assessment methods should be presented in the 2008 Methods Document. (EPA)

29. **Comment**: Please show how the individual lake/designated use and pollutant impairments from 2006 were carried over to the 2008 spreadsheets. (EPA)

30. **Comment**: Lakes previously listed as impaired for "Recreation Aesthetics" should be carried over to the 2008 CWA 303(d) list as impaired for phosphorus and aquatic life use or be formally delisted (see table in response below). (EPA)

Response to Comments 27 through 30: The 2008 Integrated Report has been revised to include a list of lakes and their corresponding assessment units as Appendix L. As explained in Section 1.2 of the 2008 Methods Document, the Department no longer assesses lakes separately from other waters (as was done in previous Integrated Lists); therefore, there is no longer a separate assessment method for lakes. For the 2008 Integrated Report, lake data was assessed along with other monitoring data from the same assessment unit (see Chapter 5: Evaluation of Data From Multiple Stations Within an Assessment Unit for further explanation) based on the applicable designated use, associated parameters, and applicable surface water quality criteria. Surface water quality criteria for lakes, as well as for all other surface waters, are provided in the New Jersey Surface Water Quality Standards, 7:9B (Appendix I of the 2008 Integrated Report).

While the 2008 Integrated List (Appendix A) identifies the assessment results for each assessment unit/designated use, Appendix B identifies assessment unit/pollutant combinations for waters assessed as not attaining the designated use. All lake/pollutant combinations from the 2006 303(d) List were reevaluated in 2008. If an assessment unit containing a lake was assessed as attaining the use in 2008 but the lake was listed as impaired in 2006, then the lake/pollutant combination was delisted (see Appendix C, Delisting Document). If an assessment unit containing a lake was assessed as not attaining the designated use(s) and the lake was listed as impaired in 2006, then the lake/pollutant combination was "carried over" and the entire assessment unit containing the lake was assigned to Sublist 5 and placed on the 2008 303(d) List (Appendix B).

The Department previously assessed lakes for Recreational Aesthetics. However since this is not a designated use, this assessment has been deleted. In 2006 a total of 11 lakes were listed as impaired for the "Recreational Aesthetics". The table below shows the results of the 2008 assessment decisions for the Assessment Units containing the 2006 listed lakes. Unless a TMDL was approved, the assessment unit where the lake is located and the pollutants impairing the aquatic life use are listed on Appendix B.

WMA	**Lake Acres**	**Assessment Unit**	**Recreation (Aesthetics)**	**Response**
17	14	Albert Giampietro	Sublist 5	This lake/pollutant combination was delisted (Appendix C) because a TMDL was approved for **phosphorus**; however, the assessment unit containing this lake was assigned to Sublist 5 for non-attainment of the general aquatic life use and was placed on the 2008 303(d) List for exceedances of **pH**.
20	23	Allentown Lake	Sublist 5	This lake/pollutant combination was delisted (Appendix C) because a TMDL for **phosphorus** was approved; however, the assessment unit containing the lake was assigned to Sublist 5 for non-attainment of the general aquatic life use and was placed on the 2008 303(d) List for "**cause unknown**".
12	36	Como Lake	Sublist 5	The assessment unit containing this lake (02030104090080-01) was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **phosphorus**
10	20	Etra Lake	Sublist 5	The assessment unit containing this lake (02030105100050-01) was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **phosphorus**

18	18	Grenlock Lake	Sublist 5	The assessment unit containing this lake (02040202120030-01) was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **phosphorus**
12	16	Lake Takanassee	Sublist 5	The assessment unit containing this lake 02030104090010-01, which contains this lake, was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **Cause Unknown.**
5	17	North Hudson Park Lake	Sublist 5	The assessment unit containing this lake (02030101170010-01) was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **Cause unknown.**
12	22	Spring Lake	Sublist 5	The assessment unit containing this lake (02030104090080) containing this lake was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **phosphorus.**
9	4	Weamaconk Lake	Sublist 5	The assessment unit containing this lake (02030105150010-01), which contains this lake, was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **TSS, turbidity and phosphorus.**
7	69	Weequahic Lake	Sublist 5	The assessment unit containing this lake (02030104010010-01) was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **phosphorus.**
12	86	Wreck Pond	Sublist 5	The assessment unit containing this lake (02030104090080-01) was assigned to Sublist 5 for non-attainment of the aquatic life use and placed on the 2008 303(d) List for **phosphorus.**

31. **Comment**: The response to comments for the Draft Methods Document says, "When a model is determined to adequately predict water quality, it may be used in place of ambient water quality data." The revised 2008 Methods Document states: "the Department will evaluate the results on a case-by-case basis to determine if they should be considered with equal weight as actual sampling data." These two responses differ. Please provide more detail. Please identify any instance of modeling results being used to not list a waterbody on the Section 303(d) List when actual data points indicate an exceedance of any WQS. (EPA)

Response to Comment: These statements are not contradictory. By evaluating the results on a case-by-case basis to determine if they should be considered with equal weight as actual sampling data, the Department may determine that a model has more or less weight than sampling data. For example, a model may be given more weight when evaluating human health criteria with a 70-year exposure time or less weight when evaluating a "not-to-exceed" acute criterion. Model data were used in the upper Passaic River to determine that water quality is met as part of the Passaic River TMDL approved by USEPA. Model results were also used to assess use attainment in the NY-NJ Harbor.

32. **Comment**: The information to support the 4B placement of HUC 02030103050080-01 Pequannock R (below Macopin gage) for temperature must be provided. (EPA)

Response to Comment: Placement Sublist 4B was an error. The 2008 303(d) List has been revised to show that Assessment Unit 02030103050080-01 Pequannock R (below Macopin gage) is assigned to Sublist 4A for temperature because a TMDL has been approved for that assessment unit/parameter combination.

33. **Comment**: Please provide more explanation for delisting code definition "7B- Dioxin in fish tissue folded into PCB in fish tissue." (EPA)

Response to Comment: Dioxin was erroneously placed on the 2006 303(d) List and waters listed as impaired due to this pollutant were removed from the 303(d) List and Sublist 5 in 2008 after consultation with the Department's Division of Science, Research and Technology, which concurred that while there was data to support fish advisories in these waters due to PCB contamination of fish tissue, no such data was available to support similar action for dioxin. The 2008 Integrated Report has been revised. Code 7B was removed from the Delisting codes in the Delisting Document (Appendix C) and Chapter 7 of the 2008 Methods Document (Appendix F). Dioxin delistings attributed to Code 7B are now shown in the 2008 Integrated Report as Code 14: "Assessment unit/parameter combination was incorrectly included on a previous 303(d) List; however, there is insufficient information to assess compliance with applicable SWQS."

34. **Comment**: The September 11, 2008 public information session discusses "a new delisting" protocol using sediment data. This information is absent from the Methods document. If this protocol was used for delisting decisions in the 2008 submittal, please insert the language for the method in a revised Methods document and provide the information to support delisting specific HUCs. (EPA)

Response to Comment: The Department's 2008 Assessment Methods do not include a provision for delisting based on sediment data. The presentation made to the public on September 11, 2008 did not mention sediment data. However, the Department did indicate in Chapter 9 of the 2008 Integrated Report that we will be evaluating whether sediment quality can be used to prioritize water column monitoring for metals.

35. **Comment**: Appendix D, which includes the 2-year schedule, identifies 104 segments for which TMDLs will be developed. Section 4.2 ("Actions Planned", p.38) of the Integrated Water Quality and Monitoring and Assessment Report document states that a total of 86 TMDLs are planned to be completed within the next two years. Please clarify that the 86 TMDLs will address all 104 segments in Appendix D. (EPA)

Response to Comment: The comment refers to the section of the 2008 Integrated Report that discusses assessment of Aquatic Life Uses in New Jersey waters. The "Actions Planned" listed on Page 38 identify the number of TMDLs planned to be completed in the next two years to address waters assessed as not attaining the aquatic life use. These include 76 TMDLs for total phosphorus, 8 for total suspended solids, and 2 for dissolved oxygen. This total does not represent the total number of TMDLs to be completed in the next two years for all New Jersey waters. That total (104) is presented in Appendix D of the 2008 Integrated Report, which includes 16 TMDLs for fecal coliform and one for total coliform. The 86 TMDLs listed on page 38 added to the 17 TMDLs for coliform in Appendix D represents the total 104 TMDLs planned to be completed by the Department in the next two years.

36. **Comment**: Appendix J: "Status of TMDLs from the 2006 Integrated Report's Two-Year TMDL Schedule" is listed in the table of contents but is not included in the document. (EPA)

Response to Comment: Appendix J: "Status of TMDLs from the 2006 Integrated Report's Two-Year TMDL Schedule" can be found on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/draft_2008_integrated_report.pdf.

37. **Comment**: The Integrated Report p. 97, states that since 2000, 441 TMDLs have been completed. According to the national database NTTS, there are 484 New Jersey TMDLs entered into NTTS. (EPA)

Response to Comment: The NTTS is an active database that reflects the cumulative number of TMDLs completed in "real time". For example, the NTTS database on November 7, 2008 shows that a total of 361 TMDLs were completed between 1996 and 2006, and an additional 76 and 32 TMDLs were completed in 2007 and 2008, respectively. The 2008 Integrated Report provides a "snapshot in time" and reflects data collected during the reporting period (January 1, 2002 through December 31, 2006) as well as information corresponding to the reporting period or current from at the time the report was written. Since Integrated Reports are generated every two years, each one is not a "living document" and information contained within each will be replaced by more up-to-date information in each subsequent iteration. The Integrated Report cannot reasonably be expected to be consistent with real-time data from other sources such as USEPA's the NTTS database.

38. **Comment**: The HydroQual January 2008 report "Identify Sub-Regions of NY/NJ Harbor Exceeding Endpoints in Water, Sediment, and Biota" states on p. 5-14 "…the arithmetic and geometric mean concentrations of the CARP data in the Passaic River [for dibenzo(a,h)anthracene], 0.0212 and 0.0192 µg/L, both exceed the NJ human health standard of 0.0180 µg /L. This contaminant should be identified for the Passaic River in Sublist 5 or on Sublist 4B if the specifics of this situation support that a TMDL is not required. (EPA)

Response to Comment: The Integrated List (including Sublist 4 and 5) identifies only assessment unit/designated use combinations; it does not identify pollutants. Pollutants causing non-attainment of a designated use or uses are identified on the 303(d) List for each assessment unit/designated use combination assigned to Sublist 5 of the Integrated List. An assessment unit that is not attaining its designated use(s) would be assigned to Sublist 5 unless a TMDL for that assessment unit/pollutant combination was already approved (Sublist 4A) or if other enforceable pollutant control measures are reasonably expected to result in the attainment of the designated use in the near future (Sublist 4B).

This comment refers to a report generated by HydroQual, Inc. Environmental Engineers & Scientists that evaluated data collected by the New York/New Jersey Harbor Estuary Contaminant Assessment and Reduction Program (CARP) to determine which constituents required the development of Total Maximum Daily Loads. A total of six water quality samples were collected for dibenzo(a,h)anthracene in the Passaic River. This data was used to calibrate a model for the NY/NJ Harbor waters to predict water quality. While the mean of the six water quality samples was 0.0212 µg/L, the model predicted a mean concentration of 0.016 µg/L, which is less than the SWQS criterion 0.0180 µg/L for dibenzo(a,h)anthracene. As indicated in Section 5 of the 2008 Assessment Methods, modeling results may be used in combination with or in lieu of actual sampling results to assess use attainment. Because the exposure period for human health criteria is seventy years, the Department determined this model to be a better predictor than the six water quality samples of long term water quality/criterion exceedance and attainment of the fish consumption use. Based on the CARP modeling results, the Department determined that fish consumption use in the Passaic River was not attained but did not list dibenzo(a,h)anthracene on the 2008 303(d) List (Appendix B). The Department did list chlordane, dieldrin, dioxin, DDD, DDE, DDT, mercury, and PCBs based on non-attainment of the fish consumption use.

39. **Comment**: The Section 303(d) list parameter "fecal coliform /*E. coli*" is not explained. Please identify which Surface Water Quality Standards is exceeded and explain what this impairment means on the 303(d) list. If these are waters where the old and now not effective fecal coliform WQS is exceeded, then the water should remain on the 303(d) list for fecal coliform unless there are sufficient E. coli data to either list or delist these waters; or a method to assess the fecal coliform data against the E. coli standard is developed. (EPA)

Response to Comment: This comment refers to waters that were listed as impaired on the 2006 303(d) List because fecal coliform levels exceeded the fecal coliform criteria. The Surface Water Quality Standards have subsequently been revised and replaced with *E. coli* criteria. Since both fecal coliform and *E. coli* are indicators of the presence of pathogens in the water column, the Department preferred using the generic term "pathogens" as the pollutant causing non-attainment to eliminate confusion during the change in Surface Water Quality Standards from fecal coliform to *E. coli*. Therefore, assessment units previously identified as not attaining based on fecal coliform will not be delisted until water quality data demonstrates that the new *E. coli* water quality criteria is attained.

40. **Comment:** Windward Beach located in assessment unit 02040301040020-01 was placed on the 2004 303(d) List based on an exceedance of the fecal coliform criterion used to assess recreational use in saline waters and was carried over to the 2006 Integrated List for pathogens. It was not shown as a delisted parameter in 2006. Why is this assessment unit/pollutant combination not on the 2008 303(d) List? (EPA)

Response to Comment: Windward Beach located in assessment unit 02040301040020-01 was placed on the 2004 303(d) List based on an exceedance of the fecal coliform criterion used to assess recreational use in saline waters. In 2006, the Surface Water Quality Standards were amended to use *Enteroccoci* as the pathogenic indicator for saline waters, and exceedances of this criterion were listed as "Pathogens" on the 2006 303(d) List. Since data showed exceedances specifically of *Enterococci* (unlike pathogen data for freshwaters, which is a combination of fecal coliform and/or E. Coli data), the 2008 303(d) List correctly identifies the parameter causing non-attainment of the recreation use in this assessment unit as *Enterococci*.

41. **Comment**: Commenter requested that the Department verify the following potential omissions [see table in Response, below] from the 2008 303(d) list: (EPA)

Response: Listing results for the assessment unit/pollutant combinations cited by the commenter as potential omissions from the 2008 303(d) List (see table below) are summarized in the Response column of this table. There were no omissions.

2006 Assessment Unit Name	2006 Pollutant	Response
Carasaljo Lake-13	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
Cooper R (Wallworth gage to Evesham Rd)	Tetrachloroethylene (PCE)	This assessment unit/pollutant combination is identified on the 2008 303(d) List.
Cooper River (above Evesham Road)	Tetrachloroethylene (PCE)	This assessment unit/pollutant combination is identified on the 2008 303(d) List.

Cooper River (below Rt 130)	Tetrachloroethylene (PCE)	This assessment unit/pollutant combination is identified on the 2008 303(d) List.
Cooper River (Rt 130 to Wallworth gage)	Tetrachloroethylene (PCE)	This assessment unit/pollutant combination is identified on the 2008 303(d) List.
Rockaway R (Boonton dam to Stony Brook)	Tetrachloroethylene (PCE)	This assessment unit/pollutant combination was not carried over to the 2008 303(d) List because it had already been delisted in 2006. (Note: While it was correctly identified on the 2006 Appendix C Delisted Waters Document, it was inadvertently included on the 2006 303(d) List.)
Rockaway R (Passaic R to Boonton dam)	Tetrachloroethylene (PCE)	This assessment unit/pollutant combination was not carried over to the 2008 303(d) List because it had already been delisted in 2006. (Note: While it was correctly identified on the 2006 Appendix C Delisted Waters Document, it was inadvertently included on the 2006 303(d) List.)
Rockaway R (Stony Brook to BM 534 brdg)	Tetrachloroethylene (PCE)	This assessment unit/pollutant combination was not carried over to the 2008 303(d) List because it had already been delisted in 2006. (Note: While it was correctly identified on the 2006 Appendix C Delisted Waters Document, it was inadvertently included on the 2006 303(d) List.)
Gandy's Beach	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.

Green Valley Beach Campground	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
Intervale Lake-06	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
Lake Coxtoxen-19	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
Lake Mohawk-02	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
Lake Silvestro-18	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
Lake Winona-01	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.

Lake1757-14	Cause Unknown	Assessment Unit 02040301150040-01, which contains Lake 1757-14, is on the 2008 303(d) List for pH exceedances. Since the cause of use non-attainment is a known parameter, it would be inappropriate to list these waters for "cause unknown".
Newton Lake-18	Chlordane	Assessment Unit 02040202120090-01, which contains Newton Lake, is listed on the 303(d) for chlordane.
Parsippany Lake-06	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
Pond at Conference Center (Left & Rt.)	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
North Run (above Wrightstown bypass)	Phosphorus	This assessment unit/pollutant combination is identified on the 2008 303(d) List.
North Run (above Wrightstown bypass)	Total suspended solids	This assessment unit/pollutant combination is identified on the 2008 303(d) List.
Sleep Valley Lake	Pathogens	This assessment unit/pollutant combination is identified in the 2008 Delisting Document (Appendix C), which includes the corresponding delisting codes explaining the basis for the delisting of each assessment unit.
Wallkill R (Ogdensburg to SpartaStation)	Temperature	This assessment unit/pollutant combination is identified on the 2008 303(d) List.

42. **Comment**: Based on information contained in the TMDL report for phosphorus for the non-tidal Passaic River, the lower terminus of the Peckman River should be listed for phosphorus. (EPA)

Response to Comment: The Department has determined that Assessment Unit 02030103120020-01 – Peckman River below CG Res. was incorrectly assigned to Sublist 4 (TMDL approved) of the 2008 Integrated List. While a TMDL was approved for the Passaic River, the Peckman River was determined to not be critical to the eutrophication conditions addressed by the TMDL study and; therefore, was not covered by the TMDL. Based on water quality data showing exceedance of the numeric phosphorus criterion, Assessment Unit 02030103120020-01 was reassigned to Sublist 5 of the final 2008 Integrated List of Waters for the aquatic life use and added to the final 2008 303(d) List for phosphorus.

43. **Comment**: The following waters should be placed in Sublist 4A since they were identified as impaired and received load allocations in the "Non-tidal Passaic River Phosphorus TMDL": Pompton Lake, Wanaque Reservoir, and Dundee Lake. (EPA)

Response to Comment: While the phosphorus TMDL was approved for these assessment units, it did not address all causes of aquatic life use non-attainment. The approved TMDL determined that existing concentrations of phosphorus did not render the waters unsuitable for this designated use. Other SWQS criteria (temperature, dissolved oxygen, and/or un-ionized ammonia) indicated that the aquatic life use was not attained. Therefore, these assessment units remain on Sublist 5 and the 303(d) List as correctly shown in Appendix A and B of the 2008 Integrated Report.

44. **Comment**: Commenter would like to review the *Enterococci* data from the five-year period that was reviewed, as it probably would indicate impairment even though the beach closure data do not. Due to the transient and intermittent nature of fecal pollution and its sources, the Department should revise the method used to assess impairments of recreational waters. The percentage of samples tested that exceed the USEPA single standard criteria would provide a more accurate means of assessing impairment than the currently used 2-day exceedance that leads to beach closures. While the latter method does indicate more persistent sources or poorly flushed areas, it minimizes the public health risk present at many beaches and prevents identification of areas affected by pollution but that have more transitory sources and/or greater flushing rates. Clearly, the Atlantic Coast (Sandy Hook to Navesink River) is an area with high flushing rates due to ocean tides and currents. (COA)

Response to Comment: Ocean monitoring data are available at http://www.njbeaches.org/ under "Ocean Monitoring Results." Regarding the assessment method for attainment of the recreational use, it is based on beach closure data at designated beaches *and* the geometric mean in all waters. In addition to the recreation use assessments based on beach closures, the Department evaluates the geometric mean in accordance with the SWQS where data requirement are met which includes waters with bathing beaches and those without. The Department uses all data, including data from environmental stations, to determine if the geometric mean is violated. The geometric mean was not violated in these assessment units; therefore, these assessment units were assessed as attaining the recreational use. The single samples are used to close bathing beaches as per the USEPA Guidance. Therefore, no changes were made to the 303(d) List for the reason cited by the commenter.

45. **Comment**: The 303(d) list should also include the northern Atlantic Coast from Sandy Hook to Metedeconk River based on shellfish growing water classifications maps from 2002, 2004, 2006-2008 that show this region as a Prohibited Area. The assessment units that fall in this range include Atlantic Coast (Navesink to Whale Pond, Whale Pond to Shark River, Shark River to Manasquan, and Manasaquan to Herring Island) Inshore and Offshore. We would like to see the data that support the Department's assessment as Sublist 2 (attaining the designated use) for this region. While these prohibited areas do not fully extend to three miles, they do cover the inshore/nearshore ocean waters and significant portions of the offshore assessment units. (COA)

Response to Comment: The assessment units containing the Atlantic Coast (inshore and offshore) from Navesink to the Manasquan Inlet are classified, in part, as "Administrative Prohibited" shellfish waters pursuant to N.J.A.C. 7:12. These waters were classified as "Administrative Prohibited" as a precautionary measure due to the large number of sewage treatment plant outfalls in the vicinity. Administrative closures are established in areas around potential pollution sources, such as sewage outfalls and marinas, as a preventive measure to prevent the harvest of possibly contaminated shellfish. According to the 2008 Methods Document, "Where shellfish harvest is prohibited due an administrative closure that is based on land use (e.g., marinas, treatment plant outfalls, etc.), such prohibited areas will not be included in the overall assessment." Therefore, the portion of the Atlantic Coast (inshore and offshore) from Navesink to the Manasquan Inlet that is classified as administrative prohibited was not included in the assessment of the remainder of the assessment units, which were classified as "approved". Therefore, these assessment units were assessed as attaining the shellfish harvest for consumption use and correctly assigned to Sublist 2.

46. **Comment**: The 303(d) list indicates only inshore and offshore assessment units. However, according to the Methods Document: "The offshore HUCs are divided into a near shore assessment unit extending perpendicular to the shore 1500 feet out and an offshore area extending from 1500 feet to the three nautical mile boundary. The inshore assessment unit represents the outward extent of the designated bathing beaches along the Atlantic Coast." So are the nearshore and inshore assessment units the same with 1500 feet marking the end of the beach bathing area? Or is there a) an inshore unit that is from the shore to the extent of the bathing area, b) a nearshore unit that is from the bathing area to 1500 feet, and c) an offshore term that is from 1500 feet to the 3 nautical mile state boundary? (COA)

Response to Comment: The Department agrees with the comment that the phrase "The offshore HUCs are divided into a near shore assessment unit extending perpendicular to the shore 1500 feet out and an offshore area extending from 1500 feet to the three nautical mile boundary is confusing and has revised the 2008 Methods Document to read: "The ocean HUCs are divided into a near shore assessment unit extending perpendicular to the shore 1500 feet out and an offshore area extending from 1500 feet to the three nautical mile boundary.

47. **Comment**: Just a small clarification, in the 303(d) list, Arthur Kill is spelled incorrectly as "Arther Kill." (COA) (EPA)

Response to Comment: The 2008 303(d) List was revised to correct the spelling of the Arthur Kill.

48. **Comment:** While the NJDEP states eutrophication is a water quality problem in the Integrated Report (p. 12), the only related aquatic life use impairment in marine waters that the NJDEP currently recognizes is dissolved oxygen conditions. Indeed, NJDEP is aware of this limitation and has stated in the Integrated Report that it is developing benthic estuarine and marine indicators to identify aquatic life impairments. At the Barnegat Bay State of the Bay conference, NJDEP again mentioned this development and said that it will be based on both the EPA's National Coastal Assessment and NOAA's National Estuarine Eutrophication Assessment (NEEA) tools and results from ongoing research efforts. In addition to a benthic index of biota integrity, COA supports a multifaceted assessment method that draws on several symptoms of eutrophication to determine the overall eutrophic condition of an estuary for both state estuaries and coastal waters.

Given the severe impacts of eutrophication on the marine life in New Jersey's waters, it is important to address the issue now as well. Waters impaired by eutrophication should be recognized on the 303(d) list, so that TMDLs are required to reduce nutrient pollution. For instance, previous studies have assessed Barnegat Bay as "highly eutrophic," with even more severe symptoms in the 2007 report compared to 1999 assessment. This is a devastating trend that is leading to ecology-system dominated primarily by phytoplankton, bacteria, and sea nettles. This tragedy is also likely to be repeated in other coastal areas of the state. It is critical that the NJDEP move new assessment methods forward expeditiously and take actions now that lead to reduce nutrient loadings to coastal waters, especially to Barnegat Bay. The following list is not comprehensive, but is meant as starting place. NJDEP should not wait for the completion of a TMDL to take action to address the problems in Barnegat Bay.

NJDEP should support the nitrogen fertilizer ordinance proposed for Ocean County by Save Barnegat Bay. NJDEP must implement and enforce more effective regional and municipal stormwater management plan that actually reduce pollution. For example, the State should provide incentives for reducing impervious surface areas in the watershed. NJDEP should also continue actions that support the Clean Air Act's requirement to reduce nitrogen air pollution. Based on discussions at recent ANJEC and Barnegat Bay Conferences, the State needs to have better communication, coordination, and consistency among its departments for municipal and county for pollution reduction requirements. NJDEP must ensure the protection of water quality within these plans. Restoration of natural fresh water flows must also be a priority. (COA)

Response to Comment: Waters are placed on the 303(d) List when readily available data that meets the Department's data quality requirements demonstrates an exceedance or exceedances of the promulgated surface water quality standards (SWQS) established for the use or uses designated for those waters (see N.J.A.C. 7:9B). At this time, the only SWQS promulgated for aquatic life uses designated for estuarine waters (including the Barnegat Bay) are for dissolved oxygen (DO). As discussed in the 2008 Integrated Report, the Department agrees that DO concentration alone is an inadequate indicator of aquatic life use attainment in estuarine and marine waters and that better indicators are needed. To that end, the Department has developed a Nutrient Criteria Enhancement Plan (NCEP) that identifies, among other things, plans to develop new benthic indicators and assessment methods to address this deficiency. The Department is currently working with USEPA and Rutgers, The State University on development of benthic indicators and an estuarine eutrophication assessment method. These efforts are summarized on page 72 of the final 2008 Integrated Report (Section 4.8).

Agency-Initiated Changes:

1. In re-reviewing the 2008 Methods Document, the Department determined that some of the language in Section 1.1 Background was inconsistent with the 2008 Integrated Report and has been corrected so that the Integrated List is referred to as the "Integrated List of Waters" and the 303(d) List is referred to as the "List of Water Quality Limited Waters (303(d) List)" for consistency between the two documents.

2. In re-reviewing Table 4.8-2: Assessment Results Based on Best Professional Judgment" of the 20008 Integrated Report, the Department determined that Assessment Unit 02020007010070-01 (Wallkill River (Martins Rd to Hamburg SW Bdy) should be added to the 2008 303(d) List for "Cause Unknown" as the cause of non-attainment of the aquatic life use. This correction has been made in the revised final 303(d) List.

3. In reevaluating the mercury water column data, the Department determined that two Metedeconk River assessment units should not have been placed on the 2008 303(d) List for mercury since they meet the applicable aquatic life criteria and the human health criteria. The Department removed assessment units 02040301040020-01 Metedeconk River (Beaverdam Ck to confl) and 02040301020050-01 Metedeconk River NB (confluence to Rt 9) from the revised final 2008 303(d) List. "Cause Unknown" was added to the list for assessment unit 02040301020050-01 Metedeconk River NB (confluence to Rt 9) as the cause of non-attainment of the aquatic life use.

4. In reevaluating Appendix A: 2008 Integrated List of Waters, the Department determined that the designated water supply uses were applied inconsistently to some assessment units. The Department corrected Appendix A to reflect the applicability of water supply designated uses to these assessment units, and their assessment results/sublist assignments. The Department

also corrected Appendix A to reflect fish consumption use assessment based on water column as well as fish tissue data.

Changes to Appendix A: 2008 Integrated List of Waters

Assessment Unit ID	Assessment Unit Name	Appendix A changes
02040301130010-01	Four Mile Branch (Mill Creek)	Agricultural water supply use changed from N/A to Sublist 3
02040301110040-01	Oyster Creek (above Rt 532)	Agricultural water supply use changed from N/A to Sublist 3
02040301140010-01	Mill Branch (above GS Parkway)	Agricultural water supply use changed from N/A to Sublist 3
02040301060050-01	Dove Mill Branch (Toms River)	Agricultural water supply use changed from N/A to Sublist 3
02040301130050-01	Westecunk Creek (above GS Parkway)	Agricultural water supply use changed from N/A to Sublist 3
02040301060050-01	Dove Mill Branch (Toms River)	Industrial water supply use changed from N/A to Sublist 3
02040105210060-01	Jacobs Creek (above Woolsey Brook)	Fish consumption use changed from Sublist 3 to Sublist 5
02040301170020-01	Hammonton Creek (Columbia Rd to 74d43m)	Fsh consumption use changed from Sublist 3 to Sublist 5
02040301070080-01	Manapaqua Brook	Fish consumption use changed from Sublist 3 to Sublist 5
02040206200010-01	Middle Branch / Slab Branch	Fish consumption use changed from Sublist 3 to Sublist 5
02040301020040-01	Muddy Ford Brook	Fish Consumption use changed from Sublist 3 to Sublist 5
02040302050130-01	Great Egg Harbor River (GEH Bay to Miry Run)	Fish consumption use changed from Sublist 3 to Sublist 5
02040302020020-01	Absecon Creek SB	Fish consumption use changed from Sublist 3 to Sublist 5
02040302050060-01	Great Egg Harbor River (Miry Run to Lake Lenape)	Fish consumption use changed from Sublist 3 to Sublist 5
02040202020040-01	Rancocas Creek NB (NL dam to Mirror Lk)	Fish consumption use changed from Sublist 3 to Sublist 5
02040206140050-01	Blackwater Branch (below Pine Branch)	Fish consumption use changed from Sublist 3 to Sublist 5
02040206140040-01	Blackwater Branch (above/incl Pine Br)	Fish consumption use changed from Sublist 3 to Sublist 5
02040301040020-01	Metedeconk River (Beaverdam Ck to confl)	Aquatic life use was changed from Sublist 5 to Sublist 2
02040105200010-01	Lockatong Creek (above Rt 12)	Recreation use changed from Sublist 3 to Sublist 5

WMA	Assessment Unit ID	Assessment Unit Name	Parameter Delisted	Reason (ADB Code)
2	02020007010030-01	Deer Trail Lake-02	Pathogens	14
2	02020007010040-01	Wallkill R(Hamburg SW Bdy to Ogdensburg)	Mercury	1
2	02020007010040-01	Wallkill R(Hamburg SW Bdy to Ogdensburg)	Phosphorus	1
2	02020007010050-01	Crystal Springs-02	Pathogens	14
2	02020007010070-01	Wallkill R(Martins Rd to Hamburg SW Bdy)	Mercury	1
2	02020007010070-01	Wallkill R(Martins Rd to Hamburg SW Bdy)	Phosphorus	1
2	02020007020070-01	Papakating Creek (below Pellettown)	Nitrate	1
2	02020007030010-01	Sleep Valley Lake	Pathogens	14
6	02030103010060-01	Black Brook (Great Swamp NWR)	Arsenic	14
6	02030103010060-01	Black Brook (Great Swamp NWR)	Phosphorus	5
6	02030103010080-01	Dead River (above Harrisons Brook)	Phosphorus	1
6	02030103010100-01	Dead River (below Harrisons Brook)	Phosphorus	1
6	02030103010110-01	Passaic R Upr (Plainfield Rd to Dead R)	Mercury	1
6	02030103010110-01	Passaic R Upr (Plainfield Rd to Dead R)	Phosphorus	1
6	02030103010120-01	Passaic R Upr (Snyder to Plainfield Rd)	Mercury	1
6	02030103010120-01	Passaic R Upr (Snyder to Plainfield Rd)	Phosphorus	1
6	02030103010130-01	Passaic R Upr (40d 45m to Snyder Ave)	Mercury	1
6	02030103010130-01	Passaic R Upr (40d 45m to Snyder Ave)	Phosphorus	1
6	02030103010150-01	Passaic R Upr (Columbia Rd to 40d 45m)	Mercury	1
6	02030103010150-01	Passaic R Upr (Columbia Rd to 40d 45m)	Phosphorus	1
6	02030103010160-01	Passaic R Upr (HanoverRR to ColumbiaRd)	Phosphorus	1
6	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	Phosphorus	1
6	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	Phosphorus	1
6	02030103020010-01	Whippany R (above road at 74d 33m)	Temperature	1
6	02030103020020-01	Whippany R (Wash. Valley Rd to 74d 33m)	Temperature	1
6	02030103020020-01	Sunrise Lake-06	Pathogens	14
6	02030103020030-01	Powder Mill Pond-06	Pathogens	14
6	02030103020040-01	Whippany R(Lk Pocahontas to Wash Val Rd)	Phosphorus	1
6	02030103020050-01	Whippany R (Malapardis to Lk Pocahontas)	Phosphorus	1
6	02030103020080-01	Mountain Lake-06	Pathogens	14
6	02030103020080-01	Parsippany Lake-06	Pathogens	14
6	02030103020080-01	Rainbow Lakes-06	Pathogens	14
6	02030103020100-01	Whippany R (Rockaway R to Malapardis Bk)	Dissolved Oxygen	1
6	02030103020100-01	Whippany R (Rockaway R to Malapardis Bk)	Phosphorus	1
6	02030103030020-01	Lake Swannanoa-06	Pathogens	14
6	02030103030030-01	Cozy Lake-06	Pathogens	14
6	02030103030090-01	Foxs Pond-06	Pathogens	14
6	02030103030100-01	Telemark Lake-06	Pathogens	14
6	02030103030110-01	Camp Lewis-06	Pathogens	14
6	02030103030110-01	White Meadow Lake-06	Pathogens	14
6	02030103030120-01	Indian Lake-06	Pathogens	14
6	02030103030130-01	West Lake-06	Pathogens	14
06	02030103030140-01	Rockaway R (Stony Brook to BM 534 brdg)	TCE	1
6	02030103030150-01	Boonton Reservoir-06	Dioxin	14
06	02030103030150-01	Rockaway R (Boonton dam to Stony Brook)	TCE	1
6	02030103030170-01	Rockaway R (Passaic R to Boonton dam)	Phosphorus	1
06	02030103030170-01	Rockaway R (Passaic R to Boonton dam)	TCE	1
6	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	Phosphorus	1
3	02030103050070-01	Lake Edenwold-03	Pathogens	14
3	02030103050080-01	Pequannock R (below Macopin gage)	Temperature	5
3	02030103050080-01	Forest Hill Lake-03	Pathogens	14
1	02030103070010-01	Green Valley Beach Campground	Pathogens	14
3	02030103070010-01	Bubbling Springs-03	Pathogens	14
3	02030103070020-01	Belcher Creek (Pinecliff Lake & below)	Temperature	1
3	02030103070030-01	Greenwood Lake-03	Total Suspended Solids	1

WMA	Assessment Unit ID	Assessment Unit Name	Parameter Delisted	Reason (ADB Code)
3	02030103070030-01	Greenwood Lake-03	Dissolved Oxygen	1
3	02030103070040-01	Kitchell Lake-03	Pathogens	14
3	02030103070050-01	Wanaque Reservior (below Monks gage)	Phosphorus	5
3	02030103070060-01	Skyline Lakes-03	Pathogens	14
3	02030103070070-01	Wanaque R/Posts Bk (below reservior)	Phosphorus	1
3	02030103070070-01	Lake Ioscoe-03	Pathogens	14
3	02030103100010-01	Ramapo R (above 74d 11m 00s)	Phosphorus	5
3	02030103100060-01	Crystal Lake-03	Pathogens	14
3	02030103100070-01	Ramapo R (below Crystal Lake bridge)	Phosphorus	5
3	02030103100070-01	Lionhead Lake-03	Pathogens	14
3	02030103100070-01	Pompton Lake-03	Dioxin	14
3	02030103110010-01	Lincoln Park tribs (Pompton River)	Phosphorus	1
3	02030103110020-01	Pompton River	Phosphorus	1
4	02030103120020-01	Peckman River (below CG Res trib)	Dioxin	14
4	02030103120020-01	Peckman River (below CG Res trib)	Cause Unknown	1
4	02030103120030-01	Toms Lake-04	Pathogens	14
4	02030103120040-01	Molly Ann Brook	Cause Unknown	1
4	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Dioxin	14
4	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Phosphorus	1
4	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Pathogens	5
4	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Dioxin	14
4	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Pathogens	5
4	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Phosphorus	5
4	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Pathogens	5
4	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Dioxin	14
4	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Pathogens	5
4	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Phosphorus	1
4	02030103140040-01	Saddle River (above Rt 17)	pH	1
4	02030103140050-01	Saddle River (Rt 4 to Rt 17)	Mercury	1
4	02030103140050-01	Saddle River (Rt 4 to Rt 17)	Total dissolved solids	1
4	02030103140050-01	Saddle River (Rt 4 to Rt 17)	pH	1
4	02030103140060-01	Saddle River (Lodi gage to Rt 4)	Mercury	1
4	02030103140070-01	Saddle River (below Lodi gage)	Mercury	1
4	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Phosphorus	2
4	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Pathogens	1
4	02030103150040-01	Passaic R Lwr (4th St br to Second R)	Cause Unknown	1
4	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Pathogens	1
4	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	pH	1
5	02030103170020-01	Pascack Brook (below Westwood gage)	Mercury	1
5	02030103170040-01	Tenakill Brook	Mercury	1
5	02030103170050-01	Dwars Kill	Mercury	1
5	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Phosphorus	2
5	02030103180030-01	Hackensack R (Ft Lee Rd to Oradell gage)	Total suspended solids	1
5	02030103180050-01	Hackensack R (Bellmans Ck to Ft Lee Rd)	Pathogens	1
7	02030104020020-01	Elizabeth R (Elizabeth CORP BDY to I-78)	Mercury	1
7	02030104050070-01	Robinsons Br Rahway R (above Lake Ave)	Cause Unknown	1
7	02030104050080-01	Robinsons Br Rahway R (below Lake Ave)	Mercury	1
7	02030104050090-01	Rahway River SB	Mercury	1
12	02030104060010-01	Cheesequake Creek / Whale Creek	Dissolved Oxygen	1
12	02030104060010-01	Hooks Creek Lake-12	Pathogens	14
12	02030104060020-01	Matawan Creek (above Ravine Drive)	pH	10
12	02030104060030-01	Matawan Creek (below Ravine Drive)	Dissolved Oxygen	1
12	02030104060040-01	Chingarora Creek to Thorns Creek	Dissolved Oxygen	1
12	02030104060060-01	Pews Creek to Shrewsbury River	Dissolved Oxygen	1
12	02030104060060-01	Pews Creek to Shrewsbury River	Pathogens	5

WMA	Assessment Unit ID	Assessment Unit Name	Parameter Delisted	Reason (ADB Code)
12	02030104070020-01	Willow Brook	Pathogens	5
12	02030104070050-01	Mine Brook (Monmouth Co)	pH	10
12	02030104070070-01	Swimming River Reservior / Slope Bk	Pathogens	5
12	02030104070070-01	Swimming River Reservior / Slope Bk	pH	10
12	02030104070080-01	Pine Brook / Hockhockson Brook	pH	10
12	02030104070100-01	Shadow Lake-12	Mercury	2
12	02030104070110-01	Navesink R (below Rt 35)/LowerShrewsbury	pH	10
12	02030104090010-01	Whale Pond Brook	pH	10
12	02030104090010-01	Lake Takanassee-12	Pathogens	14
12	02030104090010-01	Lake Takanassee-12	Phosphorus	2
12	02030104090030-01	Deal Lake-12	Pathogens	14
12	02030104090060-01	Shark River (below Remsen Mill gage)	pH	10
12	02030104090080-01	Wreck Pond Brook (below Rt 35)	pH	10
12	02030104100030-01	Manasquan R (West Farms Rd to Rt 9)	pH	10
12	02030104100040-01	Marsh Bog Brook	pH	10
12	02030104100050-01	Manasquan R (gage to West Farms Rd)	pH	10
12	02030104100060-01	Mingamahone Brook (above Asbury Rd)	pH	10
12	02030104100070-01	Mingamahone Brook (below Asbury Rd)	Cause Unknown	1
12	02030104100080-01	Manasquan R (74d07m30s to Squankum gage)	pH	10
12	02030104100090-01	Manasquan R (Rt 70 br to 74d07m30s)	Dissolved Oxygen	1
12	02030104920010-01	Atl Coast(Sandy H to Navesink R)Inshore	Pathogens	11
12	02030104920010-02	Atl Coast(Sandy H to Navesink R)offshore	Pathogens	11
12	02030104920020-01	AtlCoast(Navesink R to WhalePond)inshore	Pathogens	1
21	02030104920020-02	AtlCoast(Navesink R to WhalePond)offshor	Pathogens	1
8	02030105010010-01	Drakes Brook (above Eyland Ave)	Cause Unknown	1
8	02030105010030-01	Budd Lake-08	Pathogens	14
8	02030105010050-01	Raritan R SB(LongValley br to 74d44m15s)	Phosphorus	1
8	02030105010060-01	Raritan R SB(Califon br to Long Valley)	Phosphorus	1
8	02030105010070-01	Raritan R SB(StoneMill gage to Califon)	Phosphorus	1
8	02030105020020-01	Spruce Run (Reservior to Glen Gardner)	Cause Unknown	1
8	02030105020040-01	Spruce Run Reservior / Willoughby Brook	Cadmium	1
8	02030105020060-01	Cakepoulin Creek	Phosphorus	1
8	02030105020080-01	Raritan R SB(Prescott Bk to River Rd)	pH	10
8	02030105020100-01	Raritan R SB(Three Bridges-Prescott Bk)	pH	10
8	02030105050010-01	Randolph Park Lake-08	Pathogens	14
8	02030105050070-01	Lamington R(HallsBrRd-Pottersville gage)	Phosphorus	1
8	02030105050100-01	Rockaway Ck SB	Temperature	1
8	02030105060040-01	Ravine Lake-08 (Sommerset Lake)	Pathogens	14
8	02030105070010-01	Raritan R NB (Rt 28 to Lamington R)	Phosphorus	1
8	02030105070010-01	Sunset Lake-08	Pathogens	14
8	02030105070030-01	Raritan R NB (below Rt 28)	Phosphorus	1
10	02030105090010-01	Stony Bk (above 74d 49m 15s)	Mercury	1
10	02030105090010-01	Stony Bk (above 74d 49m 15s)	Cause Unknown	1
10	02030105090020-01	Stony Bk (74d 48m 10s to 74d 49m 15s)	Mercury	1
10	02030105090020-01	Stony Bk (74d 48m 10s to 74d 49m 15s)	Cause Unknown	1
10	02030105090030-01	Stony Bk (Baldwins Ck to 74d 48m 10s)	Mercury	1
10	02030105090030-01	Stony Bk (Baldwins Ck to 74d 48m 10s)	Cause Unknown	1
10	02030105090040-01	Stony Bk(74d46m dam to/incl Baldwins Ck)	Mercury	1
10	02030105090040-01	Stony Bk(74d46m dam to/incl Baldwins Ck)	Cause Unknown	1
10	02030105090050-01	Stony Bk(Province Line Rd to 74d46m dam)	Total suspended solids	1
10	02030105090060-01	Stony Bk (Rt 206 to Province Line Rd)	Total suspended solids	1
10	02030105090070-01	Stony Bk (Harrison St to Rt 206)	Total suspended solids	1
10	02030105100010-01	Millstone River (above Rt 33)	pH	10
10	02030105100020-01	Millstone R (Applegarth road to Rt 33)	pH	10
10	02030105100030-01	Millstone R (RockyBk to Applegarth road)	Cause Unknown	1

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10	02030105100050-01	Rocky Brook (below Monmouth Co line)	pH	10
10	02030105100060-01	Millstone R (Cranbury Bk to Rocky Bk)	pH	10
10	02030105100070-01	Cranbury Brook (above NJ Turnpike)	pH	10
10	02030105100090-01	Cranbury Brook (below NJ Turnpike)	pH	10
10	02030105110010-01	Heathcote Brook	Cause Unknown	1
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	Mercury	1
10	02030105110060-01	Rock Brook (above Camp Meeting Ave)	Pathogens	5
10	02030105110170-01	Millstone River (below Amwell Rd)	Mercury	1
10	02030105110170-01	Millstone River (below Amwell Rd)	Arsenic	1
9	02030105120030-01	Stony Brook (North Plainfield)	Cause Unknown	1
9	02030105120050-01	Middle Brook EB	Cause Unknown	1
9	02030105120100-01	New Market Pond-09	Cause Unknown	14
9	02030105130040-01	Ireland Brook	Pathogens	1
9	02030105130050-01	Lawrence Bk (Church Lane to Deans Pond)	Mercury	1
9	02030105140010-01	Manalapan Brook (above 40d 16m 15s)	Mercury	1
9	02030105140010-01	Manalapan Brook (above 40d 16m 15s)	pH	10
9	02030105140020-01	Manalapan Bk(incl LkManlpn to 40d16m15s)	Mercury	1
9	02030105140020-01	Manalapan Bk(incl LkManlpn to 40d16m15s)	pH	10
9	02030105140030-01	Manalapan Brook (below Lake Manalapan)	pH	10
9	02030105150010-01	Weamaconk Creek	pH	10
9	02030105150020-01	McGellairds Brook (above Taylors Mills)	Phosphorus	5
9	02030105150020-01	McGellairds Brook (above Taylors Mills)	pH	10
9	02030105150030-01	McGellairds Brook (below Taylors Mills)	pH	10
9	02030105150060-01	Matchaponix Brook (below Pine Brook)	pH	10
9	02030105160010-01	Deep Run (above Monmouth Co line)	pH	10
9	02030105160020-01	Deep Run (Rt 9 to Monmouth Co line)	pH	10
9	02030105160040-01	Deep Run (below Rt 9)	pH	10
1	02040104090020-01	Clove Brook (Delaware R)	Temperature	1
1	02040104130010-01	Little Flat Brook (Beerskill and above)	Phosphorus	1
1	02040104130020-01	Little Flat Brook (Layton to Beerskill)	Phosphorus	1
1	02040104130030-01	Little Flat Brook (Confluence to Layton)	Phosphorus	1
1	02040104140020-01	Forked Brook/Parker Brook	Temperature	1
1	02040104140030-01	Big Flat Brook (Kittle Rd to Forked Bk)	Temperature	1
1	02040104140040-01	Big Flat Brook (Confluence to Kittle Rd)	Temperature	1
1	02040104240020-01	Dunnfield Creek (incl UDRV)	pH	10
1	02040105040050-01	Fox Hollow Lake-01	Pathogens	14
1	02040105040070-01	Paulins Kill (Dry Brook to Rt 15)	Arsenic	14
15	02040105070010-01	Lenape Lake-15	Mercury	2
1	02040105070020-01	Forest Lake-01	Pathogens	14
1	02040105090050-01	Furnace Lake-01	Pathogens	14
1	02040105100020-01	Honey Run	Temperature	1
1	02040105110020-01	Buckhorn Creek (incl UDRV)	Cause Unknown	1
1	02040105150020-01	Lake Hopatcong-01	Pathogens	14
1	02040105150020-01	Lake Hopatcong-01	Cause Unknown	14
1	02040105150020-01	Lake Winona-01	Pathogens	14
1	02040105150040-01	Lubbers Run (above/incl Dallis Pond)	Cause Unknown	1
1	02040105150050-01	Lackawanna Lake-01	Pathogens	14
1	02040105150070-01	Musconetcong R(Waterloo to/incl WillsBk)	Phosphorus	1
11	02040105230010-01	Assunpink Lake-11	Mercury	2
11	02040105230030-01	New Sharon Branch (Assunpink Creek)	pH	10
11	02040105240030-01	Miry Run (Assunpink Cr)	pH	10
11	02040105240030-01	Miry Run (Assunpink Cr)	Phosphorus	5
20	02040201030010-01	Duck Creek and UDRV to Assunpink Ck	Dioxin	14
20	02040201040050-01	South Run (North Run to Jumping Brook)	pH	10
20	02040201050040-01	Crosswicks Ck(Walnford to Lahaway Ck)	pH	10

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20	02040201050040-01	Crosswicks Ck(Walnford to Lahaway Ck)	Total suspended solids	1
20	02040201050040-01	Crosswicks Ck(Walnford to Lahaway Ck)	Turbidity	1
20	02040201050050-01	Crosswicks Ck(Ellisdale trib - Walnford)	pH	10
20	02040201050050-01	Crosswicks Ck(Ellisdale trib - Walnford)	Total suspended solids	1
20	02040201050070-01	Crosswicks Ck(Doctors Ck-Ellisdale trib)	Dioxin	14
20	02040201060020-01	Doctors Creek (Allentown to 74d28m40s)	pH	10
20	02040201060030-01	Doctors Creek (below Allentown)	Phosphorus	5
20	02040201070020-01	Crosswicks Ck(below Doctors Creek)	Dioxin	14
20	02040201070020-01	Crosswicks Ck(below Doctors Creek)	Total suspended solids	1
20	02040201070030-01	Shady Brook/Spring Lake/Rowan Lake	Dioxin	14
20	02040201080020-01	Blacks Creek (Bacons Run to 40d06m10s)	pH	10
20	02040201080030-01	Blacks Creek (below Bacons Run)	Dioxin	14
20	02040201090010-01	Crafts Creek (above Rt 206)	pH	10
20	02040201090020-01	Crafts Creek (below Rt 206)	Dioxin	14
20	02040201090020-01	Crafts Creek (below Rt 206)	pH	10
20	02040201090030-01	LDRV tribs (Assiscunk Ck to Blacks Ck)	Dioxin	14
20	02040201100010-01	Assiscunk Creek (above Rt 206)	pH	10
20	02040201100010-01	Assiscunk Creek (above Rt 206)	Phosphorus	5
20	02040201100020-01	Barkers Brook (above 40d02m30s)	pH	10
20	02040201100020-01	Barkers Brook (above 40d02m30s)	Phosphorus	5
20	02040201100040-01	Assiscunk Ck (Jacksonville rd to Rt 206)	Mercury	1
20	02040201100040-01	Assiscunk Ck (Jacksonville rd to Rt 206)	pH	10
20	02040201100050-01	Assiscunk Ck(Neck Rd to Jacksonville rd)	Dioxin	14
20	02040201100050-01	Assiscunk Ck(Neck Rd to Jacksonville rd)	Mercury	1
20	02040201100050-01	Assiscunk Ck(Neck Rd to Jacksonville rd)	pH	10
20	02040201100060-01	Assiscunk Creek (below Neck Rd)	Dioxin	14
20	02040201110010-01	LDRV tribs (Beverly to Assiscunk Ck)	Dioxin	14
20	02040201110010-01	Upper Sylvan Lake-20	Pathogens	14
19	02040202030020-01	Mount Misery Bk NB (above 74d27m30s dam)	Pathogens	1
19	02040202030030-01	Mount Misery Bk MB/NB (below 74d27m30s)	Pathogens	1
19	02040202030040-01	Mount Misery Brook SB	Pathogens	5
19	02040202030090-01	Greenwood Br(below CountryLk & MM confl)	Pathogens	5
19	02040202040010-01	Rancocas Ck NB (Pemberton br to NL dam)	Mercury	1
19	02040202040010-01	Rancocas Ck NB (Pemberton br to NL dam)	Phosphorus	1
19	02040202040030-01	Rancocas Ck NB (Rt 206 to Pemberton br)	pH	10
19	02040202040030-01	Rancocas Ck NB (Rt 206 to Pemberton br)	Total suspended solids	1
19	02040202040040-01	Rancocas Creek NB (Smithville to Rt 206)	pH	10
19	02040202040050-01	Rancocas Creek NB (below Smithville)	pH	10
19	02040202040050-01	Rancocas Creek NB (below Smithville)	Dioxin	14
19	02040202050060-01	Rancocas Creek SB(above Friendship Ck)	Cause Unknown	1
19	02040202050090-01	Rancocas Ck SB (BobbysRun to Vincentown)	Dioxin	14
19	02040202050090-01	Rancocas Ck SB (BobbysRun to Vincentown)	Pathogens	1
19	02040202060020-01	Taunton Lake-19	Cause Unknown	14
2	02040202060030-01	Lake Mohawk-02	Pathogens	14
19	02040202060030-01	Timber Lake-19	Pathogens	14
19	02040202060040-01	Jennings Lake-19	Cause Unknown	14
19	02040202060040-01	Sturbridge Lake-19	Pathogens	14
19	02040202060050-01	Lake James-19	Pathogens	14
19	02040202060050-01	Lake1523-19	Cause Unknown	14
19	02040202060070-01	Little Creek (above Bear Swamp River)	Pathogens	1
19	02040202060070-01	Little Creek (above Bear Swamp River)	pH	10
19	02040202060090-01	Little Creek (below Bear Swamp River)	Cause Unknown	1
19	02040202060100-01	Rancocas Ck SW Branch (below Medford br)	Dioxin	14
19	02040202060100-01	Lake Coxtoxen-19	Pathogens	14

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19	02040202070010-01	Bobbys Run	Dioxin	14
19	02040202080030-01	Mill Creek (Willingboro)	Dioxin	14
19	02040202080030-01	Mill Creek (Willingboro)	Phosphorus	1
18	02040202090010-01	Swede Run	Dioxin	14
18	02040202090010-01	Swede Run	Cause Unknown	1
18	02040202090030-01	Pompeston Ck (below Rt130/Swede to 40d)	Dioxin	14
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	Phosphorus	5
18	02040202100020-01	Strawbridge Lake-18	Dioxin	14
18	02040202100020-01	Strawbridge Lake-18	Pathogens	14
18	02040202100030-01	Pennsauken Ck NB (below Strawbridge Lk)	Mercury	1
18	02040202100030-01	Pennsauken Ck NB (below Strawbridge Lk)	Cadmium	1
18	02040202100030-01	Pennsauken Ck NB (below Strawbridge Lk)	Chromium	1
18	02040202100030-01	Pennsauken Ck NB (below Strawbridge Lk)	Copper	1
18	02040202100030-01	Pennsauken Ck NB (below Strawbridge Lk)	Phosphorus	1
18	02040202110010-01	Cooper River NB(above Springdale Road)	pH	10
18	02040202110020-01	Cooper River NB(below Springdale Road)	pH	10
18	02040202110030-01	Lake Silvestro-18	Pathogens	14
18	02040202110040-01	Evans Pond-18	Dioxin	14
18	02040202110060-01	Cooper River (below Rt 130)	Phosphorus	5
18	02040202110060-01	Cooper River (below Rt 130)	Mercury	1
18	02040202110060-01	Cooper River Lake-18	Chlordane	14
18	02040202110060-01	Cooper River Lake-18	Dioxin	14
18	02040202120030-01	Big Timber Creek SB (above Lakeland Rd)	Cause Unknown	1
18	02040202120050-01	Big Timber Creek SB (below Bull Run)	Dioxin	14
18	02040202120060-01	Almonesson Creek	Dioxin	14
18	02040202120070-01	Little Timber Creek (Gloucester City)	Dioxin	14
18	02040202120080-01	Big Timber Creek (below NB/SB confl)	Dioxin	14
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	Temperature	1
18	02040202120090-01	Newton Creek (LDRV-Kaighn Ave to LT Ck)	Zinc	1
18	02040202120090-01	Newton Lake-18	Dioxin	14
18	02040202120100-01	Stewart Lake-18	Dioxin	14
18	02040202120110-01	Woodbury Ck (below Rt 45)/LDRV to B T Ck	Dioxin	14
18	02040202120120-01	Main Ditch / Little Mantua Creek	Dioxin	14
18	02040202130040-01	Mantua Ck (Edwards Run to rd to Sewell)	Dioxin	14
18	02040202130050-01	Edwards Run	Dioxin	14
18	02040202130060-01	Mantua Creek (below Edwards Run)	Dioxin	14
18	02040202140040-01	Moss Branch / Little Timber Ck (Repaupo)	Dioxin	14
18	02040202140050-01	RepaupoCk(belowTomlin Sta Rd)/CedarSwamp	Dioxin	14
18	02040202160010-01	Oldmans Creek (above Commissioners Rd)	pH	10
18	02040202160020-01	Oldmans Creek (Rt45 to Commissioners Rd)	pH	10
18	02040202160040-01	Beaver Creek (Oldmans Creek)	Dioxin	14
18	02040202160050-01	Oldmans Creek (Center Sq Rd to KingsHwy)	Dioxin	14
18	02040202160050-01	Oldmans Creek (Center Sq Rd to KingsHwy)	Phosphorus	5
18	02040202160060-01	Oldmans Creek (below Center Sq Rd)	Dioxin	14
17	02040204910030-01	Gandy's Beach	Pathogens	14
17	02040206020010-01	LDRV tribs (Lakeview Ave to Oldmans Ck)	Dioxin	14
17	02040206020020-01	LDRV tribs (Marsh Pt-Main St Pennsville)	Dioxin	14
17	02040206030010-01	4 Seasons Campground Pond-17	Pathogens	14
17	02040206040020-01	Fenwick Creek / Keasbeys Creek	Dioxin	14
17	02040206040030-01	Salem R (Fenwick Ck to 39d40m14s dam)	Dioxin	14
17	02040206040040-01	Salem R (below Fenwick Creek)	Dioxin	14
17	02040206060050-01	Alloway Ck (Quinton to Alloway-WdstwnRd)	Dioxin	14
17	02040206060060-01	Alloway Creek (New Bridge to Quinton)	Dioxin	14
17	02040206060070-01	Harmony trib (Alloway Creek)	Dioxin	14
17	02040206060080-01	Alloway Ck (HancocksBridge to NewBridge)	Dioxin	14

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17	02040206060090-01	Alloway Ck (below HancocksBr) to Salem R	Dioxin	14
17	02040206060100-01	Hope Creek / Artificial Island	Dioxin	14
17	02040206070010-01	Fishing Creek / Bucks Ditch/Pattys Fork	Dioxin	14
17	02040206070020-01	Mad Horse Ck / Little Ck / Turners Fork	Dioxin	14
17	02040206070040-01	Canton Drain (below Maskell Mill)	Dioxin	14
17	02040206070060-01	Stow Creek (Canton Road to Jericho Road)	Dioxin	14
17	02040206070060-01	Stow Creek (Canton Road to Jericho Road)	Dissolved Oxygen	1
17	02040206070070-01	Raccoon Ditch (Stow Creek)	Dioxin	14
17	02040206070070-01	Raccoon Ditch (Stow Creek)	Dissolved Oxygen	1
17	02040206070080-01	Stow Creek (below Canton Rd)	Dioxin	14
17	02040206070080-01	Stow Creek (below Canton Rd)	Dissolved Oxygen	1
17	02040206070090-01	Phillips Creek / Jacobs Creek	Dioxin	14
17	02040206080010-01	Cohansey River (above Beals Mill)	pH	10
17	02040206080020-01	Cohansey R (incl HandsPond - Beals Mill)	pH	10
17	02040206080040-01	Cohansey R (incl Beebe Run to HandsPond)	pH	10
17	02040206080050-01	Cohansey R (incl CornwellRun - BeebeRun)	pH	10
17	02040206090030-01	Sunset Lake-17	Pathogens	14
17	02040206100040-01	Cedar Lake-17	Pathogens	14
17	02040206100060-01	Nantuxent Creek (above Newport Landing)	pH	10
17	02040206110030-01	Oranoaken Creek	Dissolved Oxygen	1
17	02040206120020-01	Eastern Gate Lake-17	Pathogens	14
17	02040206120020-01	Franklinville Lake-17	Pathogens	14
17	02040206120040-01	Holly Green Campground Pond-17	Pathogens	14
17	02040206120050-01	Still Run (WillowGroveLk - SilverLakeRd)	pH	10
17	02040206120050-01	Iona Lake-17	Pathogens	14
17	02040206130010-01	Wilson Lake-17	Pathogens	14
17	02040206130030-01	Indian Branch (Scotland Run)	pH	10
17	02040206130040-01	Malaga Lake-17	Pathogens	14
17	02040206140010-01	MauriceR(BlkwtrBr to/incl WillowGroveLk)	pH	10
17	02040206140040-01	Blackwater Branch (above/incl Pine Br)	pH	10
17	02040206140050-01	Blackwater Branch (below Pine Branch)	pH	10
17	02040206140060-01	Maurice R (Sherman Ave to Blackwater Br)	pH	10
17	02040206150030-01	Palatine Branch (Muddy Run)	pH	10
17	02040206150030-01	Palatine Branch (Muddy Run)	Phosphorus	1
17	02040206150050-01	Parvin Lake-17	Pathogens	14
17	02040206160030-01	Maurice River(Union Lake to Sherman Ave)	pH	10
17	02040206170020-01	White Marsh Run (Millville)	pH	10
17	02040206180020-01	Cedar Branch (Menantico Creek)	Cause Unknown	1
17	02040206180030-01	Menantico Creek (above Rt 552)	Cause Unknown	1
17	02040206180050-01	Menantico Creek (below Rt 552)	pH	10
17	02040206200020-01	Muskee Creek	Cause Unknown	1
16	02040206220030-01	Dennis Creek (Jakes Landing Rd to Rt 47)	pH	10
16	02040206220040-01	Dennis Creek (below Jakes Landing Rd)	pH	10
16	02040206230040-01	Green Ck (Norburys Landng to Pierces Pt)	pH	10
16	02040206230050-01	Fishing Creek / Fishing Mill Stream	pH	10
13	02040301020010-01	Metedeconk R NB(above I-195)	pH	10
13	02040301020020-01	Metedeconk R NB(Rt 9 to I-195)	pH	10
13	02040301020020-01	Metedeconk R NB(Rt 9 to I-195)	Phosphorus	1
13	02040301020030-01	Haystack Brook	pH	10
13	02040301020030-01	Haystack Brook	Phosphorus	1
13	02040301020040-01	Muddy Ford Brook	pH	10
13	02040301020050-01	Metedeconk R NB (confluence to Rt 9)	pH	10
13	02040301020050-01	Ocean County Park Lake-13	Pathogens	14
13	02040301030010-01	Metedeconk R SB (above I-195 exit 21 rd)	pH	10
13	02040301030020-01	Metedeconk R SB (74d19m15s to I-195 X21)	pH	10

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13	02040301030030-01	Metedeconk R SB(BennettsPd to 74d19m15s)	pH	10
13	02040301030040-01	Metedeconk R SB (Rt 9 to Bennetts Pond)	pH	10
13	02040301030040-01	Metedeconk R SB (Rt 9 to Bennetts Pond)	Phosphorus	1
13	02040301030040-01	Carasaljo Lake-13	Pathogens	14
13	02040301030050-01	Metedeconk R SB (confluence to Rt 9)	pH	10
13	02040301040020-01	Metedeconk R (Beaverdam Ck to confl)	pH	10
13	02040301060010-01	Toms River (above Francis Mills)	pH	10
13	02040301060010-01	Toms River (above Francis Mills)	Dioxin	14
13	02040301060060-01	Toms River (Hope Chapel Rd to Bowman Rd)	Dioxin	14
13	02040301060060-01	Toms River (Hope Chapel Rd to Bowman Rd)	pH	10
13	02040301060070-01	Toms River (Rt 70 to Hope Chapel Road)	pH	10
13	02040301060080-01	Toms River (Oak Ridge Parkway to Rt 70)	Dioxin	14
13	02040301060080-01	Toms River (Oak Ridge Parkway to Rt 70)	pH	10
13	02040301070040-01	Ridgeway Br (below Hope Chapel Rd)	pH	10
6	02040301070040-01	Pond at Conference Center (Left & Rt.)	Pathogens	14
13	02040301070090-01	Pine Lake-13	Pathogens	14
13	02040301080050-01	Wrangel Brook (below Michaels Branch)	pH	10
13	02040301080060-01	Toms R Lwr (Rt 166 to Oak Ridge Pkwy)	pH	10
13	02040301080080-01	Long Swamp Creek	Cause Unknown	1
13	02040301090030-01	Bamber Lake-13	Pathogens	14
13	02040301090060-01	Cedar Creek (below GS Parkway)	pH	10
13	02040301110020-01	Deer Head Lake-13	Pathogens	14
13	02040301110020-01	Lake Barnegat-13	Pathogens	14
13	02040301110050-01	Oyster Creek (below Rt 532)	Dissolved Oxygen	1
13	02040301120010-01	Waretown Creek / Lochiel Creek	pH	10
13	02040301120010-01	Ocean Twp Bathing Beach-13	Pathogens	14
13	02040301130010-01	Holiday Lake-13	Pathogens	14
13	02040301130030-01	Manahawkin Lake-13	Pathogens	14
13	02040301130040-01	Cedar Run	pH	10
13	02040301140020-01	Mill Branch (below GS Parkway)	pH	10
13	02040301140040-01	LEH Bay tribs(Westecunk Ck-Tuckerton Ck)	Dissolved Oxygen	1
14	02040301150030-01	Indian Mills Lake-14	Cause Unknown	14
6	02040301150030-01	Intervale Lake-06	Pathogens	14
14	02040301150040-01	Springers Brook / Deep Run	Copper	1
14	02040301150080-01	Batsto R (Batsto gage to Quaker Bridge)	Copper	1
14	02040301160040-01	Wisickaman Creek	Cause Unknown	1
14	02040301160050-01	Atco Lake-14	Cause Unknown	14
14	02040301160060-01	Beaverdam Lake-14	Cause Unknown	14
14	02040301160080-01	Lake Mo-Li-Th-Ma-14	Cause Unknown	14
14	02040301160100-01	Anchor Lake One-14	Cause Unknown	14
14	02040301160100-01	Lake1950-14	Cause Unknown	14
14	02040301160120-01	Elm (James) Lake-14	Cause Unknown	14
14	02040301160120-01	Lake1970-14	Cause Unknown	14
14	02040301170010-01	Hammonton Lake-14	Pathogens	14
14	02040301170040-01	Mullica River (BatstoR to PleasantMills)	Copper	1
14	02040301170080-01	Mullica River (Lower Bank Rd to Rt 563)	Pathogens	1
14	02040301170100-01	Landing Creek (above Rt 563)	Cause Unknown	1
14	02040301180070-01	Oswego River (below Andrews Road)	Zinc	1
14	02040301200020-01	Wading River (Rt 542 to Oswego River)	Dissolved Oxygen	1
14	02040301200030-02	Wading River (below Rt 542)	Dissolved Oxygen	1
14	02040301200050-02	Bass River EB	Copper	1
17	02040301200050-02	Albert Giampietro-17	Phosphorus	5
14	02040301200100-02	Morses Mill Stream	Cause Unknown	1
14	02040301200110-02	Mattix Run (Nacote Creek)	pH	10
15	02040302030030-01	Four Mile Branch (GEHR)	pH	10

WMA	Assessment Unit ID	Assessment Unit Name	Parameter Delisted	Reason (ADB Code)
15	02040302030050-01	Squankum Branch (GEHR)	Mercury	1
15	02040302040070-01	Braddock Lake-15	Pathogens	14
15	02040302040070-01	Cushman Lake-15	Pathogens	14
15	02040302040080-01	GEHR (39d32m50s to Hospitality Branch)	Mercury	1
15	02040302040090-01	GEHR (Rt 322 to 39d32m50s)	Mercury	1
15	02040302040110-01	GEHR (Mare Run to Rt 322)	Mercury	1
15	02040302040120-01	Buena Vista CG-15	Pathogens	14
15	02040302050010-01	Watering Race Branch (Babcock Creek)	pH	10
15	02040302060010-01	Mill Br (above Cardiff-Bargaintown rd)	pH	10
15	02040302060020-01	Maple Run/Mill Br(Zion Rd to Cardiff rd)	pH	10
15	02040302070050-01	Tarkiln Brook (Tuckahoe River)	pH	10
16	02040302080080-01	Lake Laurie-16	Pathogens	14
Zone 1	Delaware River 1	Delaware River 1C2	Lead	1
Zone 1	Delaware River 10	Delaware River 1E1	Cadmium	1
Zone 1	Delaware River 10	Delaware River 1E1	Chromium	1
Zone 1	Delaware River 10	Delaware River 1E1	Copper	1
Zone 1	Delaware River 11	Delaware River 1E2	Chromium	1
Zone 1	Delaware River 11	Delaware River 1E2	Copper	1
Zone 1	Delaware River 11	Delaware River 1E2	Pathogens	1
Zone 1	Delaware River 12	Delaware River 1E3	Chromium	1
Zone 1	Delaware River 12	Delaware River 1E3	Copper	1
Zone 1	Delaware River 12	Delaware River 1E3	Pathogens	1
Zone 1	Delaware River 13	Delaware River 1E4	Chromium	1
Zone 1	Delaware River 13	Delaware River 1E4	Copper	1
Zone 1	Delaware River 13	Delaware River 1E4	Pathogens	1
Zone 1	Delaware River 14	Delaware River 1E5	Chromium	1
Zone 1	Delaware River 14	Delaware River 1E5	Copper	1
Zone 1	Delaware River 14	Delaware River 1E5	Pathogens	1
Zone 2	Delaware River 15	Delaware River 2	Cadmium	1
Zone 2	Delaware River 15	Delaware River 2	Dioxin	14
Zone 2	Delaware River 15	Delaware River 2	Pathogens	1
Zone 3	Delaware River 16	Delaware River 3	Dioxin	14
Zine 5	Delaware River 18	Delaware River 5A	Copper	1
Zone 5	Delaware River 19	Delaware River 5B	Copper	1
Zone 1	Delaware River 2	Delaware River 1C3	Lead	1
Zone 1	Delaware River 3	Delaware River 1C4	Lead	1
Zone 1	Delaware River 4	Delaware River 1D1	Lead	1
Zone 1	Delaware River 5	Delaware River 1D2	Lead	1
Zone 1	Delaware River 5	Delaware River 1D2	Total dissolved solids	1
Zone 1	Delaware River 6	Delaware River 1D3	Lead	1
Zone 1	Delaware River 6	Delaware River 1D3	Pathogens	1
Zone 1	Delaware River 7	Delaware River 1D4	Lead	1
Zone 1	Delaware River 7	Delaware River 1D4	Total dissolved solids	1
Zone 1	Delaware River 8	Delaware River 1D5	Lead	1
Zone 1	Delaware River 8	Delaware River 1D5	Total dissolved solids	1
Zone 1	Delaware River 9	Delaware River 1D6	Lead	1
Zone 1	Delaware River 9	Delaware River 1D6	Pathogens	1
Zone 1	Delaware River 9	Delaware River 1D6	Cadmium	1

Appendix D: Reserved

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
Atlantic County Health Department	Stillwater Building 201 South Shore Road Northfield, NJ,08225		(609) 645-7000		Environmental Health Atlantic County Government	Atlantic County ocean and bays	pathogens	2002-2006	Yes
Brick Township MUA	1551 Highway 88 West, Brick Twp. NJ 08724	Robert A. Karl	732-458-7725		www.brickmua.com	Metedeconk River	pH, temp, nitrate, nitrite, TKN, ammonia, specific cond., fecal coliform, total coliform, TSS, turbidity, TP, ortho phosphorus, DO, TDS, TOC, TPHC, metals, BNAs, COD, BOD	2002-2006	Yes
Cape May County Health Department	Cape May County Health Department 4 Moore Road Cape May Court House, NJ 08210		(609) 465-1187		Cape May County - Hot Topics-Bathing Beach Reports	Cape May ocean and bay	pathogens	2002-2006	Yes
Center for Biological Diversity	1095 Market Street, Suite 511, San Francisco, CA 94103	Miyoko Sakasshita	415-436-9682 x 308	miyoko@biologicldiversity.org			No Data	N/A	No. A request to consider carbon dioxide pollution impairments in the listing process. No criteria

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
DRBC	P.O. BOX 73P.O. BOX 7360, West Trenton, NJ 08628-0360 FAX (609) 883-9522	Edward Santoro	609-883-9500	Edward.Santoro@drbc.state.nj.us	www.drbc.net	Delaware River tribs	Nitrate as N, Total, Conductance, Specific - Field, DO Saturation, Oxygen, Dissolved, pH, Salinity, Secchi Depth in Meters, Temperature, Air, Temperature, Water, Sodium, Total, Alkalinity (Titrimetric, pH 4.5), Chloride, Total, Nitrite as N, Total, Residue, Nonfilterable (TSS), Turbidity, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,2-Dichlorobenzene, 1,2-Dichloroethane (EDC), 1,2-Dichloropropane, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzene, Bromodichloromethane, Bromoform, Bromomethane, Carbon Tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane, Ethylbenzene, Isopropylbenzene (Cumene), m/p-Xylene, Methyl tert-Butyl Ether (MtBE), o-Xylene, Tetrachloroethene, Toluene, trans-1,2-Dichloroethene, trans-1,3-Dichloropropene, Trichloroethene, Vinyl Chloride, Xylenes (Total), E. Coli, Enterococcus, Coliform, Fecal, Ammonia as N, Total, Phosphorus, Total as P, Kjeldahl Nitrogen, Total (T	2002-2006	Yes
Evesham MUA (TRC Omni)	PO Box 467, 984 Tuckerton Rd., Evesham, NJ 08053 TRC Omni Environmental Corp., 321 Wall Street, Princeton, NJ 08053	Rocco Maiellano-EMUA; Raymond Ferrara- TRC Omni	609-924-8821 (ext 14)			NB Rancocas	nutrients, TDS, SC, TSS, Temp, Flow, DO, pH	2004	Yes

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
Great Swamp Watershed Association	568 Tempe Wick Road, Harding Twp, NJ P.O. Box 300, New Vernon, NJ 07976	Kelley A. Curran	973-538-3500 x16	kcurran@greatswamp.org	website: www.greatswamp.org	Great Swamp Watershed	Biological, Total Kjeldahl Nitrogen "as N", Nitrate "as N", Dissolved Reactive Phosphorus, Nitrate+Nitrite Nitrogen, Ammonia Nitrogen, Total Suspended Solids, BOD5, Fecal Coliform, Chlorophyll a, Phytoplankton, Zooplankton' Chloride, Soluble Reactive Phosphate"as P", Total Phosphorus "as P",	2002-2006	Yes
Hammonton Twp	100 Central Avenue, Hammonton, New Jersey 08037	Anthony DeCicco	609-567-4331				Nutrient data	2004	No. Did not have adequate GPS locational data.
Interstate Environmental Commission	311 West 43rd Street - Suite 201 New York, New York 10036 Phone: (212) 582-0380 Fax: (212) 581-5719				www.iec-nynjct.org/	NY/NJ Harbor	Pathogens	2002-2004	Yes
Interstate Environmental Commission	311 West 43rd St., Suite 201, New York, NY 10036	Peter Sattler	(212) 581-5719		www.iec-nynjct.org	NY/NJ Harbor	Pathogens	2005-2006	No. Data not readily available during data solicitation period
Lake Hopatcong Commission/ Princeton Hydro	117 Lakeside Blvd., Landing, New Jersey 07850-1120/Princeton Hydro, LLC, 1108 Old York Road, Suite 1, P.O. Box 720, Ringoes, New Jersey 08551	Dr Fred Lubnow	(P) 908.237.5660 • (F) 908.237.5666	flubnow@princetonhydro.com		Lake Hopatcong	Chla, NH3 N, NO3N, TP, TSS	2003-2004	Yes
Lake Hopatcong Commission/ Princeton Hydro	117 Lakeside Blvd., Landing, New Jersey 07850-1120/Princeton Hydro, LLC, 1108 Old York Road, Suite 1, P.O. Box 720, Ringoes, New Jersey 08551	Dr Fred Lubnow	(P) 908.237.5660 • (F) 908.237.5666	flubnow@princetonhydro.com		Lake Hopatcong	DO. Temp, Turbidity, TDS, pH, NO3, NH4	2003-2005	Yes

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
Lake Hopatcong Commission/ Princeton Hydro	117 Lakeside Blvd., Landing, New Jersey 07850-1120/Princeton Hydro, LLC, 1108 Old York Road, Suite 1, P.O. Box 720, Ringoes, New Jersey 08551	Dr Fred Lubnow	(P) 908.237.5660 • (F) 908.237.5666	flubnow@princetonhydro.com		Lake Musconetcong	Seccchi, Temp, pH, DO, specific conductance	2003	Yes
Medford Township	17 North Main Street, Medford, NJ 08055	Ryan Willitts	(609) 654-7886	Ryan Willitts			Nutrient Data	2004	No. Stations not located and data not electronic
Monmouth County Health Department	Monmouth County Health Department 3435 Hwy. 9 Freehold, NJ 07728		(732) 431-7456		Water Quality Monitoring	Watersheds within Monmouth County	Macroinvrtibrate, fecal coliform, enterococcus, Total Ammonia(mg NH3 + NH4/L), Un-ionized Ammonia (mg NH3-N/L), Total Phosphorus(mg/L), Residue, non-filterable (TSS), (mg/L), pH, standard units, Turbidity, NTU, Temperature, C, Salinity,	2002-2006	Yes
Musconetcong S.A./ Najarian Ass.	Tavit Najarian. Najarian Ass. Industrial Way West. Eatontown, NJ 07724	Fred S. Lubnow, Ph.D.	(908) 237-5660			Musconetcong	Do, Temp, pH, Tp Chla,	2004	Yes
New Jersey Meadowlamds Commission	Meadowlands Environmental Research Institute, New Jersey Meadowlands Commission, 2 DeKorte Park Plaza, Lyndhurst, NJ 07071	Edward Konsevick	201-460-4646	Ed.konsevick@njmeadowlands.gov	Meadowlands Environmental Research Institute	Hackensack River Watershed	Cadmium, Chromium, Copper, Iron, Lead, Nickel, Zinc; Hardness, Fecal Coliform bacteria, BOD and COD; Nitrate, Ammonia, Chloride, Sulfate, TSS, TDS, Turbidity; Temperature, Conductivity, Salinity, pH and DO	2002-2006	Yes
NewJersey Harbor Discharge Group	Passaic Valley Sewerage Commissioners, 600 Wilson Avenue, Newark, New Jersey 07105	Bridget M. McKenna, Mick DeGrave	(973) 817□5976	bmckenna@pvsc.com		Passaic River. NY/NJ Harbor	Pathogens, nutrients, organics, conventionals	202-2006	Yes

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
NJDEP	NJDEP Water Monitoring and Standards, PO 409, 401 E. State Street, Trenton, NJ 08625				http://www.nj.gov/dep/wmm/monitoringdata.html	Statewide	flow, field parameters, total and filtered nutrients and filtered ions. Bacterial indicators are measured 5 times within 30 days, during the summer, primary contact season. Supplemental parameters, collected at a subset of stations and at a reduced frequency include: diurnal D.O., pesticides, total recoverable metals, VOC,	1998-2006	Yes
NJWSA	74 E. Main Street, Sommerville, NJ 08876	Todd Kratzer	908-685-0315 X30			Lockatong & Wickeckeoke Creeks	Conductivity, pH, Air Temp, Water Temp, DO, Boron, Nitrite, Nitrate, Ammonia, TKN, TP, TSS, Turbidity	2006	Yes
Ocean County Health Department	Ocean County Health Department 175 Sunset Ave. Toms River, NJ 08754		(732) 341-9700 or 1-800-342-9738		http://www.ochd.org/beach/	Ocean County ocean and bay	Pathogens	2002-2006	Yes
Pequannock River Coalition	PO Box 392, Newfoundland, NJ 07435	Ross Kushner	973-492-3212		www.pequannockriver.org	Wanaque and Pequannock watersheds	Temperature, DO	2002-2006	Yes
Phillipsburg, Town of /Hydroqual	Hydro Qual Inc, 1200 Mac Arthur Blvd., Mahwah, NJ 07430	Pat Kehrberger	(201)529-5151, (201)529-5728 fax,		http://www.hydroqual.com	Lopatcong Crek	DO. Temp, Turbidity, TDS, pH, TOC, Copper, NH3, NO3, Phosphorus	2005	Yes
Pinelands Commission	PO Box 7, New Lisbon, NJ 08064	Robert Zampella	609-894-7300	info@njpines.state.nj.us	www.nj.gov/pinelands/	Rancocas Creek, Egg harbor River, Barnegat Bay, Mullica river watersheds	Biological Data	1999-2003, depending upon basin	No. QA/QC documentation not available, used to validate PMI only.
Pompeston Creek Watershed Association	P.O. Box 2883 Cinnaminson, NJ 08077	Debbie Lord	856-630-0663	dglord@aol.com	www.pompestoncreek.org	Upper W. Br. Pompeston Cr. & Pompeston mainstem	*E. coli* , fecal coliform, *Enterococci* , nitrate-N, orthophosphate-P/total phosphorus-P, and total suspended solids	2004-2006	Yes
Pompeston Creek Watershed Association	P.O. Box 2883 Cinnaminson, NJ 08077	Debbie Lord	856-630-0663	dglord@aol.com	www.pompestoncreek.org	Upper East & West Branches of the Pompeston Cr.	*E. coli* , fecal coliform, *Enterococci* , nitrate-N, orthophosphate-P/total phosphorus-P, and total suspended solids	2004-2006	Yes

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
Princeton Hydro,LLC (Eric Silldorf))	Princeton Hydro, LLC 1108 Old York Road, Suite 1 • PO Box 720 • Ringoes, NJ 08551 • Telephone: 908-237-5660 • Fax: 908-237-5666	Fred S. Lubnow, Ph.D.	(908) 237-5660			Lake Hopatcong and Lake Musconetcong	dissolved oxygen (DO), temperature, pH and conductivity, total phosphorus, nitrate-N, ammonia-N, total suspended solids and chlorophyll a	2003	Yes
Rutgers Environmental Law Clinic	123 Washington Street, Newark, NJ 07102	Julia Le Mense	973-353-5695				No Data	N/A	No. A request to consider nitrogen impairments in the listing process. No criteria for nitrogen in marine waters
South Branch watershed Ass.	Lechner House, 41 Liliac Dr., Flemington, NJ 08822	Nicole Rahman	908-782-0422	nicolerahman@sbwa.org	www.sbwa.org	So. Branch Raritan river	Biological,	2005-2006	Yes
Stony Brook-Milllstone Watershed Association (SBMWA)	31 Titus Mill Rd., Pennington, NJ 08534	Peggy Savage	609-737-3735	psavage@thewatershed.org	www.thewatershed.org	Stony Bk Millstone R watershed: Duck Pond Run and Heathcote Brook	fecal & total coliform and bacteria	2005	Yes
Sussex County MUA	Sussex County Municipal Utilities Authority/ Wallkill River Watershed Management Group 34 South Route 94 Lafayette, NJ 07848	Nathaniel Sajdak	(973)-579-6998 x 109		http://www.wallkillriver.org/	Papakating River, Wallkill River and Black Brook	DO, Temp,TDS, pH, flow, nitogen, phos, chl a	2003-2004	Yes
TRC Omni Environmental	TRC Omni Environmental Corporation Research Park 321 Wall Street Princeton, New Jersey 08540-1515	Lisa Evrard	609-924-8821 609-924-8831(Fax)		TRC Omni Environmental Corporation - Staff / Contact	Lawrence Brook	CBOD5, N-series, P-series, TDS, TSS, fecal coliform, and fecal strep.	2004	Yes

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
TRC Omni Environmental/SVRSA/SBRSA and Montgomery Twp	TRC Omni Environmental Corporation Research Park 321 Wall Street Princeton, New Jersey 08540-1515	James Cosgrove	609-924-8821 609-924-8831(Fax)		TRC Omni Environmental Corporation - Staff / Contact	Raritan/Millstone	pH (s.u.), Temp. (deg C), DO (mg/l), Alkalinit, CBOD5, TKN, NH3-N, NO3-N, NO2-N, TN, D-OPO4, TP, TDS, TSS, Iron, Turbidity, Chl-a	2004	Yes
USEPA (Helicopter)	United States Environmental Protection Agency, Region 2 , 2890 Woodbridge Avenue, Edison, New Jersey 08837	Helen Grebe	732-321-6797	grebe.helen@epa.gov	http://www.epa.gov/region02/monitor/nybight/	Atlantic Ocean	pathogens	1/01/02 - 12/31/06	Yes

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
USEPA (NCA)	US EPA, Atlantic Ecology Division, 27 Tarzwell Drive, Narragansett, RI 02882	Melissa Hughes	401 782 3184	mailto:hale.stephen@epa.gov	http://www.epa.gov/emap/nca/html/data/index.html	Estuaries	Alpha.-Endosulfan, .Alpha.-Hexachlorocyclohexane, .Beta.-Endosulfan, .Beta.-Hexachlorocyclohexane, .Delta.-Hexachlorocyclohexane, 1,6,7-Trimethylnaphthalene, 1-Methylnaphthalene, 1-Methylphenanthrene, 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl, 2,2',3,3',4,4',5-Heptachlorobiphenyl, 2,2',3,3',4,4'-Hexachlorobiphenyl, 2,2',3,4,4',5,5'-Heptachlorobiphenyl, 2,2',3,4,4',5'-Hexachlorobiphenyl, 2,2',3,4',5,5',6-Heptachlorobiphenyl, 2,2',3,5'-Tetrachlorobiphenyl, 2,2',4,4',5,5'-Hexachlorobiphenyl, 2,2',4,5,5'-Pentachlorobiphenyl, 2,2',5,5'-Tetrachlorobiphenyl, 2,2',5-Trichlorobiphenyl, 2,3,3',4,4'-Pentachlorobiphenyl, 2,3',4,4',5'-Pentachlorobiphenyl, 2,3',4,4',5-Pentachlorobiphenyl, 2,3',4,4'-Tetrachlorobiphenyl, 2,4,4'-Trichlorobiphenyl, 2,4'-Dichlorobiphenyl, 2,6-Dimethylnaphthalene, 2-Methylnaphthalene, 3,3',4,4',5-Pentachlorobiphenyl, 3,3',4,4'-Tetrachlorobiphenyl, Acenaphthene, Acenaphthylene, Aldrin, Aluminum, Anthracene, Antimony, Arsenic, Benz[A]Anthracene, Benzo(B)Fluoranthene,	2001-2002	Yes
USGS	Division of Environmental Science and Assessment		Phone: (609) 771-3900 Fax: (609) 771-3915		http://waterdata.usgs.gov/nwis/sw	Non tidal statewide	Flow, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Zinc, silver,arsenic; Hardness, BOD and COD; Nitrate, Ammonia, Chloride, Sulfate, TSS, TDS, Turbidity; Temperature, Conductivity, Salinity, pH and DO; organics	1998-2006	Yes

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
Wallkill River Watershed Management Group	2890 Woodbridge Avenue, Edison, New Jersey 08837	Ernest Hofer, Watershed Specialist; nathaniel Sajdak, Watershed Coordinator	973-579-6998		www.walkillriver.org	Wallkill	Nutrients, TDS, SC, TSS, Temp, Flow, DO, pH	2005-2005	Yes
Wallkill River Watershed Management Group	2890 Woodbridge Avenue, Edison, New Jersey 08837	Ernest Hofer, Watershed Specialist; nathaniel Sajdak, Watershed Coordinator	973-579-6998		www.walkillriver.org	Clove Brook/Papakating	Nutrients, TDS, SC, TSS, Temp, Flow, DO, pH	2005-2005	Yes
Wallkill River Watershed Management Group	2890 Woodbridge Avenue, Edison, New Jersey 08837	Ernest Hofer, Watershed Specialist; nathaniel Sajdak, Watershed Coordinator	973-579-6998		www.walkillriver.org	Papakating	fecal coliform, Temp,DO, pH	2005-2005	Yes
Warren County MUA (HydroQual, Inc.)	WC (Pequest River) MUA P.O. Box 159, Belvidere, NJ 07823 475-5412 / HydroQual, Inc. 1200 MacArthur Blvd. Mahwah, NJ 07430	Patricia Kehrberger	Phone: (201) 529-5151 Fax: (201) 529-5728			Pequest River	Do, Temp., pH, Chlorophyll a , Ammonia-N , Nitrate-N , Nitrite-N , Total Phosphorus-P , Dissolved Ortho Phosphate-P , Total Dissolved Phosphorus-P , Turbidity , Total Suspended Solids , Iron ,hardness	2004-2005	Yes

Company	Address	Contact Person	Phone Number	Email	URL	Waterbody	Parameters	Time Period	Used/ If No Why
Warren County MUA (HydroQual, Inc.)	WC (Pequest River) MUA P.O. Box 159, Belvidere, NJ 07823 475-5412 / HydroQual, Inc. 1200 MacArthur Blvd. Mahwah, NJ 07430	Patricia Kehrberger	Phone: (201) 529-5151 Fax: (201) 529-5728			Pequest River	Chlorophyll a , Ammonia-N , Nitrate-N , Nitrite-N , Total Phosphorus-P , Dissolved Ortho Phosphate-P , Total Dissolved Phosphorus-P , Turbidity , Total Suspended Solids , Iron	2004-2005	Yes
Western Monmouth UA	Allied Biological, Inc. of NJ 580 Rockport Rd., Hackettstown, NJ 07840		973.579.6998 ext 109				Flow (cfs), Temp. (^{o}C), pH (s.u.), Dissolved Oxygen (mg/l), Alkalinity (mg/l), $CBOD_5$ (mg/l), Iron (mg/l), Total Suspended Solids (mg/l), Total Dissolved Solids (mg/l), Turbidity (NTU), Ammonia Nitrogen (mg/l), Nitrate Nitrogen (mg/l), Nitrite Nitrogen (mg/l), Total Kjeldahl Nitrogen, (mg/l), Diss. Reactive Phosphorus (mg/l), Total Diss. Phosphorus (mg/l), Total Phosphorus (mg/l), Chlorophyll-a Aqueous (µg/l), Chlorophyll-a Attached (mg/m²)	2004	Yes
Washington Borough	Borough of Washington • 100 Belvidere Avenue • Washington, NJ 07882-1426	Not available	(908) 689-3600	Not available	http://www.washingtonboro-nj.org/	Not available- no locational info provided	Temp (°C), pH, do, Alk, tds, , Turbidity (NTU), DRP (mg/l), Dis P (mg/l), TP (mg/l), TKN (mg/l), , NO3-N (mg/l)	2005	no

Appendix F

2008

Integrated Water Quality Monitoring and Assessment Methods

This document was prepared pursuant to Section 303(d)
of the Federal Clean Water Act

State of New Jersey
Department of Environmental Protection
Water Monitoring and Standards

Jon Corzine, Governor
Mark N. Mauriello, Acting Commissioner

December 2008

Revised June 2009

2008 Integrated Water Quality Monitoring and Assessment Methods
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1.0 Introduction

1.1 Background

The federal Clean Water Act mandates that states submit biennial reports to the U.S. Environmental Protection Agency (USEPA) describing the quality of their waters. The biennial Statewide Water Quality Inventory Report or "305(b) Report" must include the status of principal waters in terms of overall water quality and support of designated uses, as well as strategies to maintain and improve water quality. The 305(b) reports are used by Congress and USEPA to establish program priorities and funding for federal and state water resource management programs. The biennial List of Water Quality Limited Waters or "303(d) List" identifies waters that are not attaining designated uses because they do not meet surface water quality standards despite the implementation of technology-based effluent limits. States must prioritize waters on the 303(d) List of Water Quality Limited Waters for Total Maximum Daily Load (TMDL) analyses and identify those high priority waters for which they anticipate establishing TMDLs in the next two years.

Since 2001, USEPA has recommended that states integrate their 305(b) reporting requirements with their Section 303(d) reporting requirements. New Jersey has complied with this recommendation through the development of an Integrated Water Quality Monitoring and Assessment Report (Integrated Report), which was first submitted to USEPA in 2002. The Integrated Report satisfies the reporting and public participation requirements of Sections 303(d), 305(b), and 314 of the federal Clean Water Act. The New Jersey Department of Environmental Protection's (Department) 2008 Integrated Report will continue to follow the integrated report format to provide an effective tool for maintaining high quality waters where designated uses are attained, and improving the quality of waters that do not attain their designated uses. T

The 2008 Integrated Report includes an “Integrated List of Waters” (Integrated List) that combines the reporting requirements of Sections 305(b) and 303(d) of the Act. The Integrated List identifies the status of all applicable designated uses for every assessment unit by labeling the results of each designated use assessment as one of the five sublists (see Section 7.1 for complete sublist descriptions). Sublists 1 through 4 satisfy the assessment and reporting requirements of Section 305(b), while Sublist 5 is used to satisfy Section 303(d).

Section 303(d) requires states to 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). This list is referred to as the “List of Water Quality Limited Waters” or the “303(d) List”. 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 Department will be submitting the 2008 Integrated List to USEPA Region 2 via its Assessment Database (ADB). However, since the public will be afforded the opportunity to review and comment on the 303(d) List, the Department will also generate an Integrated List Table, which organizes assessment results by assessment unit, designated use, and sublist, and a separate List of Water Quality Limited Waters (303(d) List) that includes all assessment units identified as Sublist 5 (i.e., not attaining one or more designated uses), the specific pollutants not meeting SWQS in each assessment unit, and the relative rank of the assessment unit/parameter combination for TMDL development.

The USEPA guidance for developing the 2008 Integrated Report is available on the USEPA Web site at http://www.epa.gov/owow/tmdl/2008_ir_memorandum.html. The USEPA Guidance continues to recommend placing the assessment results into one of five specific categories. 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. Prior to developing an Integrated List, states are required to publish, for USEPA and public review, the methods used to collect, analyze, and interpret data, and place assessment units on their respective sublists.

The Methods Document provides an objective and scientifically sound assessment methodology, including:

- A description of the data the Department will use to assess attainment of the designated uses;
- The quality assurance aspects of the data;
- A detailed description of the methods used to evaluate designated use attainment;
- The rationale for the placement of assessment units on one of the five sublists.

The Methods Document does not establish assessment methods for assessing raw data on the Delaware River mainstem, Estuary, and Bay, fish tissue data for fish consumption, or pathogen data for shellfish. The Department uses published fish consumption advisories and shellfish classifications established under N.J.A.C. 7:12 to assess fish consumption and shellfish harvest uses. The Methods Document does explain how the Department uses the fish consumption advisories and shellfish classifications to assess the fish consumption and shellfish harvest for consumption designated uses (see Sections 6.3 and 6.4). The water quality assessment for the Delaware River mainstem, Estuary, and Bay is conducted by the Delaware River Basin Commission (DRBC) and its assessment results are incorporated into New Jersey's Integrated List. DRBC's Integrated List Assessment Methodology is contained in the 2008 Delaware River and Bay Integrated List Water Quality Assessment Report and is available on the DRBC Web site at http://www.state.nj.us/drbc/08IntegratedList/index.htm.

1.2 Summary of Major Changes from the 2006 Methods Document

Benthic Macroinvertebrate Data: New Jersey has been using biological metrics to evaluate biological conditions in freshwater streams since the early 1990s. Prior to the 2008 Integrated Report, macroinvertebrate data collected under New Jersey's Rapid Bioassessment Protocol (RBP) were evaluated using the New Jersey Impairment Score (NJIS) system for all freshwater streams. Assessments were based upon family level taxonomy with three resulting assessment categories for the biological community: not impaired, moderately impaired, and severely impaired. If biological monitoring results indicated moderate or severe impairment, the assessment unit was assessed as not attaining the aquatic life use. If biological monitoring results indicated no impairment, the assessment unit was assessed as attaining the aquatic life use.

For the 2008 Integrated Report, the Department will use three new biological indices based upon genus level taxonomy that provide four assessment categories: excellent, good, fair, and poor. 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 within the jurisdictional boundary of the Pinelands Area, as well as FW2 waters within five kilometers of the Pinelands Area boundary (see Figure 4.3). Table 4.3 lists the scores for each metric and their associated condition category. The Department will continue to accept the family level macroinvertebrate NJIS index in non-Pinelands waters; however, the new genus level metrics will be given more weight in the assessment process. The methodology for extending PMI to other FW2 waters is explained in Section 4.3 Biological Data.

Lakes

In 2006, the Department redefined the assessment units on which the Integrated Report is based as Hydrologic Unit Code 14 (HUC 14) subwatersheds but continued to list lakes separately. For the 2008 Integrated Report, the Department is integrating lakes into their corresponding HUC 14 subwatershed assessment units. Data from lake monitoring stations will be evaluated along with data from other monitoring stations associated with the assessment unit. The assessment results for a given HUC 14 subwatershed will thus reflect the water quality of all streams, rivers, and lakes located within it. Assessing lakes in conjunction with the rivers and streams in a given assessment unit will ensure a watershed-based approach to restoration and will avoid the "double counting" of pollutants that occurs when a lake and/or individual bathing beach and its subwatershed are both listed for the same pollutant. As a result, New Jersey will have one Integrated List with 970 total assessment units rather than two Lists - one for all waters except lakes (970 assessment units) and another for lakes (468 assessment units). A list of the lakes and their corresponding assessment unit will be provided in the Integrated Report. All data from surface waters within a given assessment unit will be evaluated together to determine designated use attainment, including fish consumption advisories for lakes, which will be applied to the fish consumption use assessment for the entire assessment unit (see Chapter 5: Evaluation of Data From Multiple Stations Within an Assessment Unit for further explanation).

Naturally low pH

New Jersey currently has two surface water quality criteria for pH, one criterion (generally 3.5-5.5) for the naturally acidic Pinelands waters, and another (6.5-8.5) for all other waters of the State. Pinelands waters (PL) were designated based on political boundaries that delineate the "Pinelands Area" of the State. The true extent of the low pH, low buffer capacity waters historically characteristic of the New Jersey Coastal Plain "Pinelands" lies well beyond this political boundary and is closely aligned with the underlying geology of the region. The Coastal Plain has hydrologic and geological conditions that are very similar to the Pinelands. The current pH criteria do not address the naturally acidic conditions of the Coastal Plain waters located outside of the Pinelands Area and the majority of water quality impairments attributed to pH in previous water quality assessments were for pH values lower than 6.5 in Coastal Plain waters, which suggests that that these waters were assessed as impaired solely because the pH criteria did not account for naturally-occurring acidic waters outside of the politically-derived PL classification.

In 2007, the Department initiated a study of Coastal Plain waters outside of the Pinelands Area to determine the natural water quality conditions and develop a more appropriate pH criterion and/or boundary for the PL classification. The study focused primarily on headwaters where little or no development has taken place, based on the assumption that such waters would reflect naturally-occurring pH levels. Water quality data demonstrates that surface water pH levels in the Coastal Plain are similar to that of PL waters due to similar soil types. Generally, these soils are strongly acidic with little or no buffering capacity, thus influencing surface waters running through them. When mapped out, it became apparent that these soils exist well beyond the political boundaries of the Pinelands Area and observed pH levels track the presence of these soils in the Coastal Plain. Studies have shown that other characteristics (flora and fauna) indicative of the Pinelands exist in the same areas of the Coastal Plain, beyond the Pinelands borders, as where the "pH-impaired" surface waters are located. Since surface water pH levels are locally influenced by soil type, and since soils do not follow a clear and concise pattern, New Jersey is currently developing a new pH criterion with a wider range (4.5-7.5) for the Coastal Plain waters located outside of the Pinelands Area boundary. The Department will be reevaluating impairments attributed to low pH in Coastal Plain waters where soil and vegetation are similar to Pinelands conditions, and will be delisting pH where low pH values reflect natural conditions (also see "Natural Conditions" in Section 3.2 Criteria and Policies).

Nomenclature: The 2008 303(d) List uses the individual names of the following chemical compounds, to be consistent with USEPA's assessment database (ADB), rather than the collective term for groups of similar chemical compounds used in the 2006 303(d) List. Specific changes in nomenclature between the two lists are identified below:

2006 303(d) List	2008 303(d) List
Pathogens	"Fecal Coliform/*E. coli*", "total coliform", or "enterococci"
Pesticides	heptachlor epoxide or hexachlorobenzene
DDX	DDD, DDE, and DDT
Pollutant Unknown	"Cause Unknown"
PAH (polyaromatic hydrochlorides)	benzo(a)pyrene
PCE/TCE	Tetrachloroethylene (PCE) or trichloroethylene (TCE)

Recreation

The Department will no longer be assessing "Secondary Contact Recreation" in FW, SE1, or SC waters since there are no applicable surface water quality criteria with which to assess this use in these waters. The Department will continue to assess the more stringent Primary Contact Recreation use, based on the criteria established in the SWQS for primary contact recreation in freshwaters. The Department will also continue to assess secondary contact recreation in saline waters, based on the criteria established for SE2 and SE3 waters. The methodology for assessing attainment of the primary and secondary contact recreational uses is explained in Section 6.2 Recreational Use Assessment (also see Section 4.2: Pathogenic Indicators"). The assessment method for "Recreation Aesthetics" has been removed from the Methods Document since it is not a designated use in the SWQS and nutrient impacts previously associated with Recreation

Aesthetics will be identified through the Aquatic Life Use assessment. The Department will also be discontinuing the use of "beach closure data" for freshwater beaches until such data is collected under an approved Quality Assurance Project Plan (QAPP), as explained in Section 3.1 Data Quality under "Quality Assurance".

Temperature

The Department adopted a new temperature criterion for trout production waters in October 2006 and clarified that the criteria should be implemented as a summer seasonal average. The methodology for assessing compliance with the temperature criterion is explained in Section 4.1 Physical and Chemical Data under "Continuous Monitoring – Temperature".

2.0 Overview of the Assessment Process

The Department is required to collect, review and, when appropriate, use all existing and readily available data to assess water quality for the Integrated List. 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 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 attainment at the assessment unit level. The overall assessment process used by the Department, beginning with the collection of raw data, through the assessment of designated uses, to the development of the Integrated List, is comprised of five steps, each of which is explained in detail in Chapters 3 through 7. Below is a brief summary of each chapter/step in the assessment process and an explanation of key terms (shown in bold type).

Chapter 3: Use and Interpretation of Data

The development of the Integrated List begins with collection and use of raw data. The Department reviews all existing and readily available data, as required, to ensure the use of high quality data. This includes a variety of data types, including physical/chemical data, biological community scores, beach closure days, shellfish harvest classifications, and fish consumption advisories. Some data types, such as physical/chemical data, are assessed in their raw form while other types of data, such as fish tissue concentrations and biological community scores, are evaluated by their respective programs using various methods and metrics, and only the evaluation results are used in the assessment process. All data sets are reviewed for compliance with applicable quality control and quality assurance requirements and only data that meet those requirements are used in the water quality assessment process. 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 List. 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

Once the data is reviewed and deemed appropriate for use in generating the Integrated List, the data for each parameter sampled at a specific monitoring station are evaluated for compliance with the SWQS. 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, or can be attributed to natural conditions, transient events, or flow conditions that do not represent design flows. Excursions that can be attributed to any of these conditions are not evaluated further. Excursions that cannot be attributed to one of these factors are further evaluated at the assessment unit level to determine if they collectively constitute an **exceedance** of the surface water quality criteria.

Data that cannot be evaluated based on compliance with numeric SWQS criteria, such as biological, consumption advisory, shellfish classification, and beach closure data, are assessed based on whether or not they cause water quality **impairment**, since such data serve as indicators rather than direct measures of water quality at a particular location. (Designated uses, which are assessed on an assessment unit level, are assessed as attained or not attained, as explained in Chapter 6.) Biological data are compared to established indices using a numeric scoring system representing the relative health of the biological community. The results are expressed as excellent, good, fair, or poor. Excellent and good results are assessed as not impaired; fair and poor results are assessed as impaired. Assessment of biological data at a station level is explained in more detail in Section 4.3. Similarly, the Department has established impairment thresholds for designated bathing beaches, based on the number of days a beach is closed; shellfish beds, based on classification of shellfish harvest waters; and fish consumption, based on fish consumption advisories.

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, magnitude, duration, outliers, censored data, and significant figures. This chapter also outlines the procedures for evaluating each parameter and making a determination as to whether or not the individual parameter complies with the applicable SWQS (including policies and narrative criteria) at each station.

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

Chapter 5 defines "assessment unit" and explains the process for identifying all stations associated with each assessment unit as well as what further evaluation of parameter-specific data is necessary when combined with other station data for the same parameter within the assessment unit. Policies for considering issues such as the spatial extent of beaches, transient phenomena, comparison of different biological metrics, use of modeling results, and grab sample versus continuous monitoring data are discussed. Assigning relative "weight" to data is necessary when evaluating numerous data sets that have different data collection and analysis methods, or temporal or spatial sampling variability. When data sets yield contradictory or ambiguous assessment results, a "weight of evidence" approach will be used to evaluate the different data sets in relation to one another. The Department will take into account the data sets' age, robustness, and accuracy. Other factors, such as declining trends, may also influence the weight of a given data set.

Although initial data evaluation is conducted on a station level, the designated use assessments and the resultant Integrated List are based on evaluation of assessment units that may be represented by data collected from multiple stations within each assessment unit. 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 data from different data sets yield contradictory assessments, further review is conducted that considers the age of the data and the sophistication of sampling and analytical methods used to generate the data. In large data sets, the magnitude and frequency of the exceedances are evaluated. Where there are numerous beach or shellfish harvest closures within an assessment unit, the spatial coverage of these impairments are evaluated in assessing attainment of the recreation and shellfish consumption uses for the respective assessment units.

Chapter 6: Designated Use Assessment

Designated uses of New Jersey's surface waters include aquatic life, recreation, drinking water supply, agricultural water supply, industrial water supply, fish consumption, and shellfish harvest for consumption. Water quality assessments are conducted to determine if the designated uses are **attained**, or met, in a given assessment unit. In assessing use attainment, the Department considers all exceedances and impairments (explained above) identified for each assessment unit. Chapter 6 identifies the uses designated for each SWQS classification, the minimum suite of parameters needed to assess attainment of each designated use, and the process used to assess attainment based on data sampled from multiple locations and/or for multiple parameters. Appendix A lists all the parameters that the Department might use and identifies the designated uses associated with each parameter. From that list, the Department has identified a subset of parameters, referred to as the minimum suite of parameters (Table 6.0), for which sufficient data must be available to determine that a designated use is attained.

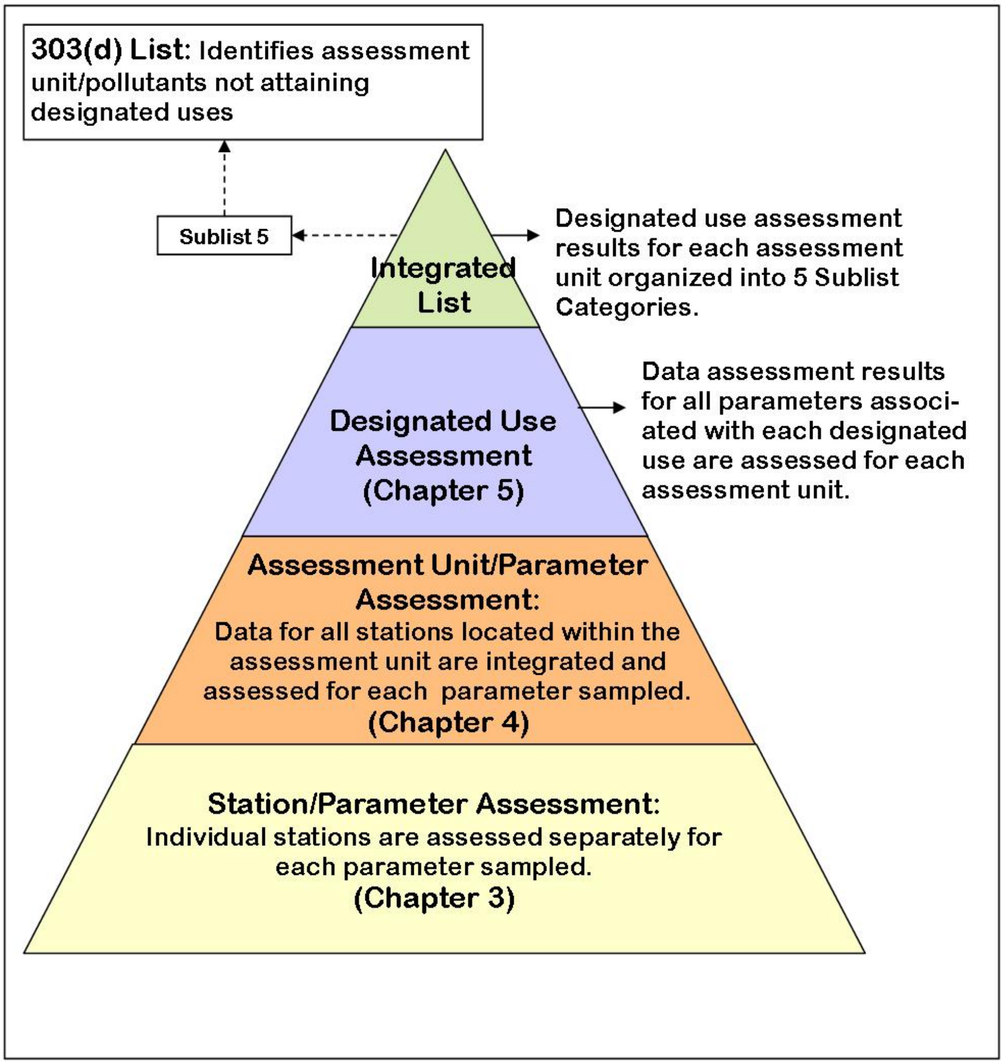
Chapter 7: Integrated Listing Guidance

Chapter 7 explains how assessment results for each assessment unit/designated use combination are depicted on the Integrated List and assigned to the appropriate sublist, taking into consideration the status of TMDLs. For each assessment unit/designated use identified as Sublist 5, the Department will identify the pollutant(s) causing the non-attainment of a designated use and place the assessment unit/pollutant combinations on the 303(d) List along with the assessment unit name and its priority ranking for TMDL development. Figure 2 on the following page illustrates the relationship between the different levels of data assessment explained in Chapters 4, 5, and 6 and used to generate the Integrated List.

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

Chapter 8 describes the methods used to rank and prioritize waterbodies for TMDL development pursuant to the requirements of the federal Clean Water Act. Chapter 9 describes the State's approach to obtaining additional data to assess compliance with SWQS in all assessment units, and to support TMDL development. Chapter 10 outlines the public participation requirements and process, both regulatory and non-regulatory, employed in the development and finalization of the Integrated List. Among other things, Chapter 10 describes the data solicitation and the public notification processes.

Figure 2: Overview of Water Quality Assessment Process



3.0 Use and Interpretation of Data

The Department reviews all existing and readily available data. With data originating from many diverse entities, the Department must ensure that the data used for assessment purposes is reliable 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 will include a list all the sources of data received and identify which sources were used, as well as provide an explanation for any data not used, to develop the Integrated List.

3.1 Data Quality

Data Age

The Department will use the most recent five years of readily available data. Data received in response to the Department's solicitation that is more than five years old may be used on a case-by-case basis. For example, older data may be used if conditions in the assessment unit have not changed. Older data may also be used in conjunction with newer data to demonstrate water quality trends where appropriate analytical methods are used and results can easily be compared with more recent data. The Department may disregard data less than five years old if newer data was collected or analyzed using scientific methods that are more precise.

Electronic Data Management

In general, only electronic data are considered "readily available" due to the significant effort needed to computerize and analyze data submitted in hard copy. The Department uses electronic data from the USEPA Storage and Retrieval (STORET) system, the United States Geological Survey (USGS) National Water Information System (NWIS), and other special programs (e.g., the USEPA Helicopter Beach Monitoring Program and local monitoring programs). The Department prefers that all data be entered into USEPA's STORET database. Additional information on STORET is available on USEPA's Web site at http://www.epa.gov/STORET. Volunteer organizations may also utilize the Department's new data management system for volunteer monitoring data located on the Department's Web site at http://www.state.nj.us/dep/wms/bfbm/vm/database.html. The Department recognizes that USEPA is migrating from STORET to a new, more technologically advanced water quality data exchange system. The Department is currently developing Web-based tools that will be compatible with this new system and expects to have the enhanced data exchange process in place for the 2010 Integrated Report.

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 200 feet. Only sampling stations that are spatially referenced will be used to develop the Integrated List.

Quality Assurance

The Department maintains a strong commitment to the collection and use of high quality data to support environmental decisions and regulatory programs. All data and information used to develop the Integrated Report must comply with the Department's Quality Assurance Guidelines, the Department's field sampling procedures, and be analyzed by a certified laboratory. 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 and review and verify the results to assure high quality data. All data generated by the Department complies with the Department's QAPP, which has been approved by USEPA.

All data submitted to the Department in response to the data solicitation for the Integrated Report must comply with a Department-approved QAPP. The QAPP must be approved by the Department's Office of Quality Assurance prior to the start of any sampling and should comply with USEPA's QAPP guidance document, available on the USEPA Web site 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, available on the Department's Volunteer Monitoring Program Web site at http://www.state.nj.us/dep/wms/bfbm/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/.

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.

Reference Reports

The Department requires "citable" hard copy reference reports for each data source. This requirement ensures that the entities responsible for generating the data used are also responsible for compiling the data, completing a detailed quality assurance review, and addressing questions regarding the data set. Citable reports offer those who review the Integrated List an opportunity to independently evaluate the underlying data. Written reports range from a brief description of the monitoring program and tables of raw data to very thorough, peer-reviewed reports. The availability of reports used in developing the Integrated List will be noted in the Integrated Report.

3.2 Criteria and Policies

Since water quality data are assessed for compliance with the Surface Water Quality Standards (SWQS), the SWQS provide the foundation for the Integrated List. 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.

Antidegradation Policy: The SWQS contain an antidegradation policy that applies to all surface waters of the State. Antidegradation is a requirement under 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 attained wherever these uses are not precluded by natural conditions. No irreversible changes may be made to existing water quality that would impair or preclude attainment 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, including stormwater permits, 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.

Narrative Water Quality Criteria: Narrative water quality criteria are non-numeric descriptions of the conditions necessary for a waterbody to attain its designated uses. To implement narrative data, which is 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, nutrients, natural conditions, and antidegradation.

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

1. None, either alone or in combination with other substances, 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 consumption advisories (see Section 6.3, Fish Consumption Use Assessment); shellfish closure data (see Section 6.4, Shellfish Use Designated Use Assessment); source water information (see Section 6.5, Drinking Water Supply Use Assessment) with regard to human health; and biological data (see Section 6.1, Aquatic Life Use Assessment) with regard to aquatic life.

Nutrients: The SWQS include narrative nutrient policies at N.J.A.C. 7:9B-1.5(g) that apply to all freshwaters of the State, in addition to the applicable numeric criteria. The narrative nutrient policies prohibit nutrient concentrations that cause objectionable algal densities, nuisance aquatic vegetation, or render waters unsuitable for designated uses. Pursuant to the New Jersey Pollution Discharge Elimination System (NJPDES) rules at N.J.A.C. 7:14A, the Department has developed a guidance manual for NJPDES-regulated facilities subject to water quality-based effluent limitations for total phosphorus entitled, "Technical Manual for Phosphorus Evaluations (N.J.A.C. 7:9B-1.14(c)) for NJPDES Discharge to Surface Water Permits." This manual outlines the steps necessary to demonstrate compliance with the nutrient criteria and policy, and is available on the Department's Web site at http://www.state.nj.us/dep/dwq/techmans/phostcml.pdf.

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." The concept of "natural causes" is applied when the Department can document that there are no anthropogenic sources or causes of a given characteristic or that the characteristic is clearly attributable to the natural conditions of the waterbody (e.g., pH in certain locations). Data that do not meet applicable SWQS criteria potentially due to natural conditions will be carefully evaluated. When the Department identifies a general area where natural conditions apply, it will discuss the assessment process in the Methods Document as it does earlier in Section 1.2 for low pH in the Coastal Plain area.

Numeric Water Quality Criteria: The surface water quality criteria established for each of the different surface water classifications in the SWQS are numeric estimates 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 Physical and Chemical Data

The Department assesses physical and chemical data for which criteria have been established in the SWQS. Conventional physical and chemical parameters include dissolved oxygen, pH, total phosphorus, total suspended solids, total dissolved solids, sulfate, temperature, chloride, and nitrate. Toxic parameters include un-ionized ammonia, metals, and organics. Un-ionized ammonia is calculated from total ammonia concentrations using pH and temperature at the time of sampling. Chemical parameters are assessed for conformance with the applicable numeric SWQS criteria. Where possible, total phosphorus is also assessed for conformance with the narrative SWQS nutrient criteria.

Once data is reviewed and deemed appropriate for use in generating the Integrated List (see Chapter 3), the data for each parameter sampled at a specific monitoring station are evaluated for compliance with the SWQS. 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, or can be attributed to natural conditions, transient events, or flow conditions that do not represent design flows. Excursions that can be attributed to any of these conditions are not evaluated further. Excursions that cannot be attributed to one of these factors are further evaluated at the assessment unit level to determine if they collectively constitute an "exceedance" of the surface water quality criteria.

Analytical Precision and Accuracy: As explained above, the Department will take into consideration the precision and accuracy of the analytical method used to measure data when an ambient measurement is compared to a numeric SWQS criterion. Analytical precision and accuracy are determined by the methods used to sample, analyze, and report data.

The precision of the analytical method is determined by the margin of error expressed for the method used. The margin of error defines the range of values that are considered to represent valid results for a specific analytical method or instrument. For example, if the surface water quality criterion is 1.0 and the margin of error for the measurement is "(+) or (–) 0.2", a reported value of 1.1 would be considered an excursion, not an exceedance.

Unlike precision, which is a function of the analytical method used, the accuracy of the data is determined by the number of decimal places used to express the surface water quality criterion. For example, when a parameter is measured in a concentration whose value is reported to three decimal places but the applicable criterion is represented by (i.e., accurate to) only two decimal places, the parameter concentration will be rounded to two decimal places to determine compliance with the criterion.

Continuous Monitoring: More and more frequently, instruments such as Datasondes are being deployed to continuously monitor the water. The parameters most commonly measured in this fashion are water temperature and dissolved oxygen (DO). The protocol for comparing these data to the SWQS criteria is as follows:

Dissolved Oxygen: The SWQS criteria for DO are expressed as either a minimum, "not less than…at any time" concentration over a 24-hour period or as a 24-hour average concentration. For the "not less than…at any time" criterion, the lowest value from each 24-hour period is compared to the criterion. An exceedance occurs when the DO criterion is not met for two or more sample intervals, each equaling at least one hour long during a 24-hour period. When comparing the data to a criterion expressed as a 24-hour average, all the individual subsamples for a 24-hour period are combined to determine the average concentration. An exceedance occurs when the 24-hour average violates the 24-hour average criterion.

When the data are combined into each assessment unit (see Chapter 5), the use is assessed as not attained when there are two exceedances of the minimum DO criterion on different days within the same data set or when two 24-hour average concentrations violate the 24-hour average criterion at the same station.

Temperature: As part of the adopted amendments to the SWQS (October 2006) the temperature criterion was changed to 20 degrees centigrade as a summer seasonal average (June 21 – September 21), to reflect recent trends in data collection such as continuous monitoring. Where continuous monitoring data is available for part of the season, the Department will calculate averages based on available datasets of 72 hours or more. In evaluating data collected over the entire summer season, the Department may consider shorter averaging periods (weekly average, 72-hour average) to ensure that averaging across an entire season does not mask elevated mid-summer temperatures.

Computations Using Censored Data: Censored data are data with concentrations that are less than the minimum reporting level 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. When calculating averages, these values are set to one-half of the reporting limit. If the criterion and sample concentration are both below the minimum reporting level (i.e., non-detect), an exceedance of the criterion can not be established.

Design Flows: Design flows are specified in the SWQS at N.J.A.C. 7:9B-1.5(c). Samples should be collected when streams are at or above design flows, as specified for the applicable numeric SWQS criteria. Flow data will be reviewed when an exceedance of a criterion is observed to determine whether the data was collected under appropriate flow conditions. For regulatory purposes, numeric criteria apply only during the specified design flow; therefore, any data that are collected when stream flows are below "design flows" are not considered valid data for assessment (or enforcement) purposes.

Duration (Exposure Periods): The SWQS includes 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 toxic substances, the Department uses the duration of chronic aquatic life and human health carcinogen criteria. For all other criteria, an individual datum is assumed to extend over the applicable duration, providing a more conservative assessment. For chronic aquatic life criteria, which have a four-day exposure period, data collected only under high flow conditions lasting less than four days are not considered valid for assessment purposes because the duration specified in the SWQS has not been met. For human health carcinogen criteria, the Department calculates a long term average of all data available for the most recent five-year period for comparison to the criterion.

Frequency of Exceedance: The Department has determined that a minimum of two exceedances of a numeric SWQS criterion over a given five-year period is necessary to confirm noncompliance with the criterion for non-toxic parameters. The Department has determined that a second exceedance is necessary to ensure that the first exceedance was not a transient condition or a result of sampling or analytical error. For toxic substances, noncompliance with the applicable SWQS criteria is confirmed by a minimum of two exceedances of an aquatic life criterion over three years, or when the long-term average concentration (see Duration, above) exceeds a human health carcinogen criterion. The SWQS identify which toxic substances have aquatic life criteria and which have human health carcinogen criteria in the table of Surface Water Quality Criteria for Toxic Substances (see N.J.A.C. 7:9B-1.14(f)7). When the minimum exceedance is met but the dataset is very large (more than 30 data points), the Department will consider the relative frequency and magnitude of the exceedances within the dataset and use Best Professional Judgment to determine if they represent non-attainment of the designated use. The Integrated Report will include an explanation of any assessment which concludes that the use is attained because of relatively low magnitude or frequency of exceedances in a very large dataset.

Minimum Number of Samples: The minimum data set consists of eight samples. The Department prefers that the period over which the samples are collected is two years, with samples collected quarterly (to capture seasonal and flow variations). These recommendations are intended to ensure that existing water quality conditions are accurately portrayed by the data, that the data do not characterize transitional conditions, and that obsolete data are not used. If data submitted do not meet these recommendations, then the Department will consider the data set on a case-by-case basis to determine if the data adequately characterizes the water quality conditions. Summer-only sampling for nutrients, pathogenic quality, and temperature may be acceptable since summer generally represents the critical condition for these parameters. If the Department determines that the data does not adequately represent the water quality conditions, the data will not be used in for assessment purposes. If the Department determines that the data set does adequately represent water quality condition and there are at least two exceedances of the Surface Water Quality Standards, this limited data set will be used to determine that a use is not attained.

Metals: 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 from all forms of the metals. To the extent available, total recoverable (TR) and dissolved fraction (DF) data will be 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 will also compare the TR concentrations to the DF criterion. If the TR concentrations are below the DF criterion, the Department assumes the DF criterion is also met. TR concentrations above the DF criterion will trigger additional sampling for DF.

Outliers: Any data that is identified as an outlier in accordance with the corresponding QAPP is not considered a valid result and is not used in for assessment purposes.

Subsamples: When data are collected in a vertical or horizontal cross section, or at several locations in close proximity to each other, the data may be combined and assessed as one sample. The individual "subsamples" are assessed as follows: when comparing data to a "not to exceed at any time" criterion, the sample is represented by the worst case subsample. When comparing the data to a criterion based on an average, all of the individual samples are combined to determine the average.

Unusual Events: All samples indicating an exceedance of the SWQS will be reevaluated by the Department to determine if the results can be attributed to an unusual event such as a pipe break, spill, plant upset, or severe weather. The Department will exclude any sample results collected under a verified unusual event as not representative of the normal range of water quality.

4.2 Pathogenic Indicators

Waters classified as FW, SE1, and SC are designated for primary contact ("in the water") recreation. All waters are designated for secondary ("on the water") contact recreation. However, SWQS criteria for secondary recreation in FW, SE1, and SC waters have not been promulgated. These waters will be assessed only for the more stringent primary contact recreation designated use. Assessment for primary contact recreation compares the geometric mean (geomean) of the water quality data for pathogenic indicators to the appropriate SWQS criterion. At least five samples collected over a 30-day period are required to calculate the geomean; however, other sampling frequencies may be acceptable provided that the frequency supports the statistical method for calculating a geomean.

In addition to assessing primary contact recreation in all FW, SE1, and SC waters, a second more stringent assessment is conducted for "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. Designated bathing beaches are assessed as attaining primary contact recreation if there are no beach closures lasting seven or more consecutive days in a given year, or the average number of beach closures is less than 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's Web site at http://www.state.nj.us/health/eoh/phss/recbathing.pdf.

Designated bathing beaches must be sampled at least once a week to protect the public health, usually every Monday. Any sampling event that indicates noncompliance with the pathogen criterion results in a beach closure until a second sample is taken, usually the following Wednesday. In assessing designated bathing beaches the Department will review the beach closure data to determine if any closures were transient anomalies, laboratory error, or due to other than water quality issues, in which case the data would not be used in the assessment. Short term beach closures of less than a week (Monday through Wednesday) generally signify occasional excursions of the pathogen criterion, unless the short term closures occur chronically over several (five or more) years, in which case the beach is assessed as impaired. A week-long beach closure signifies that noncompliance with the pathogen criterion occurred more than once within one week. One beach closure lasting seven or more consecutive days in a given year, or an average of two or more beach closures (of any duration) per year over a five-year period, is assessed as an impairment.

Recreational use assessment methods are explained in detail in Section 6.2.

4.3 Biological Data

The Department has developed biological indicators (benthic macroinvertebrates and fin fish) to serve as translators of the narrative nutrient criteria used to assess aquatic life use attainment.

Benthic Macroinvertebrate Data: New Jersey has been using biological metrics to evaluate biological conditions in freshwater streams since the early 1990s. Prior to the 2008 Integrated Report, macroinvertebrate data collected under New Jersey's Rapid Bioassessment Protocol (RBP) were evaluated using the New Jersey Impairment Score (NJIS) system for all freshwater streams. Assessments were based upon family level taxonomy with three condition categories: not impaired, moderately impaired, and severely impaired. Starting with the 2008 Integrated Report, the Department will use three new biological indices based upon genus level taxonomy. 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 within five kilometers of the Pinelands Area boundary (see Figure 4.3).

Table 4.3 lists the scores for each metric and their associated condition category. The new indices have four condition categories: excellent, good, fair, and poor. Scores aligning with the "excellent" and "good" categories are assessed as not impaired while scores in the "fair" and "poor" categories are assessed as biologically impaired, with one exception. For the new 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 nondegradation PL waters. The Department will continue to accept NJIS family level assessments; however, genus level assessments will be used in lieu of family level assessments when both are available for the same location.

Fin Fish Data - Fish Index of Biotic Integrity (FIBI): Fin fish population data are assessed using the Fish Index of Biotic Integrity (FIBI). 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 current FIBI metric applies to high gradient streams above the fall line (Highlands, Ridge and Valley, and Piedmont physiographic provinces). This metric 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. Work is continuing to evaluate impairment thresholds for FIBI data.

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 NJ Impairment Score (NJIS)*

Region Assessed by Coastal Plain Macroinvertebrate Index (CPMI)

* NJIS is no longer used by the Department but may be used by other entities

Table 4.3: 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 - 20	Not Impaired
Fair	10 - 6	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	PL waters: Impaired FW2 Waters: Not Impaired
Poor	< 34	Impaired

New Jersey Macroinvertebrate Index (NJIS)

Category	Metric Score	Assessment Result
Not Impaired	24 - 30	Not Impaired
Moderately Impaired	9 - 21	Impaired
Severely Impaired	0 - 6	Impaired

Fish Index of Biotic Integrity (FIBI)
(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

*Source: Standard Operating Procedures 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.

Regional Monitoring and Assessment Program (REMAP) Assessments: A Benthic Index of Biotic Integrity was developed for the New York/New Jersey Harbor based on USEPA Region 2's REMAP protocol and data. The results are used to assess the waters of Raritan Bay, the Arthur Kill, and the Kill van Kull. This index was developed by scoring each of five metrics as 5, 3, or 1. Overall index scores less than 3 are considered biologically impaired while scores greater than 3 are considered not impaired. Additional information about this metric is available on the USEPA Web site at http://www.epa.gov/emap/remap/html/docs/nynjsedapp1.pdf.

Additional Considerations When Evaluating Biological Data

Disturbed or impaired biota can result from extended drought or other conditions that result in reduced base flow. If biological communities are impaired due to drought-induced, low flow conditions, the impairment will be attributed to natural conditions and the data will not be considered valid for assessment purposes (see Section 3.2).

Many aquatic life use assessments are based on biological indices for benthic macroinvertebrate (e.g., PMI) and for fin fish populations (i.e., FIBI). These biota differ from one another in sensitivity to pollutants as well as temporal and spatial scales. Thus, assessment results may differ for fish and invertebrates at the same location. If at least one data set is assessed as impaired, the entire site will be assessed 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. All data from one or more monitoring stations located within a given assessment unit are extrapolated to represent all waters within that assessment unit's boundaries.

Assessment Units: New Jersey's assessment units are delineated based on Hydrologic Unit Code (HUC) 14 subwatershed boundaries except for the Delaware River mainstem, Estuary, and Bay, where assessment units are delineated based on DRBC designated zones. HUCs are geographic areas representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by USGS in cooperation with the National 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. There are currently 950 HUC 14 subwatersheds in New Jersey. HUC 14 subwatersheds range in size from 0.1 to 42 square miles, with an average size of 8.5 square miles. The Department's GIS database contains a coverage containing discrete polygons for each of New Jersey's 950 HUC 14 subwatersheds. Since the Integrated Report also addresses the 20 Delaware River zones designated by DRBC, there are a total of 970 assessment units assessed in the 2008 Integrated Report.

For the 2008 Integrated List, the identification number (ID) for each HUC 14 assessment unit was created by adding a two-digit ID number to the end of the 14-digit HUC code for that subwatershed. The offshore boundary of HUCs located along the shore was extended from three statute miles to three nautical miles, which represents the jurisdictional waters of the State of New Jersey. The Department decided to split some HUC 14 polygons into smaller, more homogeneous assessment units. The newly divided assessment units are now identified with "01" and "02" extensions. The new HUCs have the original assessment unit name but with one of the following terms added: "upstream" or "downstream" (for rivers), "inshore" or "offshore" (along the coast). The ocean HUCs are divided into a near shore assessment unit extending perpendicular to the shore 1500 feet out and an offshore area extending from 1500 feet to the three nautical mile boundary. The inshore assessment unit represents the outward extent of the designated bathing beaches along the Atlantic Coast.

Station Representation: The Department will evaluate station locations on a case-by-case basis to determine if the data from these stations should be used in assessing the adjacent assessment unit (AU). For example, it is common for monitoring sites to be placed at the terminus of one assessment unit as it flows into an adjacent assessment unit. When a monitoring site falls within 200 feet of a given assessment unit boundary, the assessment based upon that site is applied to both the assessment unit containing the site and to the adjacent assessment unit. This assignment is made provided that there are no significant tributaries, impoundments, or other hydrological alterations that could impact water quality between the monitoring site and the neighboring assessment unit. If there are no applicable monitoring stations for an assessment unit, the unit will be identified as not assessed (sublist 3).

Additional Considerations When Combining Data from Multiple Stations within an Assessment Unit

Assessment Units With More Than One Stream Classification: Data will be compared to the SWQS for the stream classification where the station is located. Where data is available for both higher and lower classification streams, the Department will use the more stringent criteria to assess designated use attainment for the assessment unit. For example, if the assessment unit contains both FW2-TM (trout maintenance) and FW2-NT (non-trout) waters, and the DO criteria are met for the FW2-NT waters but not met for the FW2-TM waters, the results for the more stringent trout maintenance criteria will be applied and the entire assessment unit will be assessed as not attaining the aquatic life use.

Where the assessment unit contains both higher and lower classification streams but there is no data for the higher classification stream segment, then data from a station located outside of the higher classification waters will be compared to the SWQS for that classification. If the lower classification waters meet the higher classification's SWQS, the data will be used to assess both classifications. However, if the data collected at the station in a lower classification does not meet the higher classification's SWQS, the assessment unit will be considered to have insufficient data with which to assess the higher classification and the assessment unit will be assessed as attaining only the general aquatic life use.

Continuous Monitoring and Grab Sampling: Grab samples collected quarterly may not capture the most critical time period; therefore, they may not reflect the worst case scenario for use attainment. Thus, the Department will give more weight to continuous monitoring data, provided that the continuous monitoring data is available for at least a single season.

De minimus: When evaluation of data at a station level identifies portions of an assessment unit as impaired but, upon further evaluation, these stations represent minute portions of the total area of the assessment unit, the Department will regard the assessed area as *de minimus* rather than impaired. The concept of *de minimus* is applied to numerous situations when evaluating assessment units. Examples of situations where a *de minimus* determination would be applied are as follows:

> <u>Recreational use assessments</u>: Where one bathing beach is impaired but several others in the same assessment unit are not, the Department will consider the water quality of the non-bathing beach areas and the frequency and duration of the closures at the one impaired beach in assessing recreational use attainment for the entire assessment unit. Where an assessment unit contains one or more impaired bathing beaches but the spatial extent of the impaired bathing beaches is a minute portion of the assessment unit, the impairment would be considered *de minimus* and would not be considered in assessing recreational use attainment for the entire assessment unit. 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. In these instances, where the Department uses Best Professional Judgment and determines that the impairment is *de minimus*, the individual

impaired bathing beaches will be identified in the Integrated Report for follow up sanitary surveys required by the DHSS.

Shellfish harvest use assessments: Assessment units overlie but do not follow shellfish classification boundaries. As a result, an assessment unit may include several different shellfish classifications. In most instances, the use assessment will be based on the most restrictive classification found within the assessment unit. In the few instances where only a very small portion of the acreage within the assessment unit is has some degree of restriction, the use assessment will be based on assessment of the larger area. Any *de minimus* areas that are restricted but are not subject to administrative closures (i.e., the restriction is due to poor water quality) will be identified in the Integrated Report.

Evaluating Contradictory Data Sets: Weighing data is necessary when evaluating numerous data sets that have different data collection and analysis methods, or have temporal or spatial sampling variability. These decisions will apply in the following situations: newer data will override older data; larger data collection sets might override or be combined with nominal data sets; and higher quality data will override data sets of lower quality based on sampling protocol, equipment, training and experience of samplers, quality control program, and lab and analytical procedures. If the Department bases its use assessment on one set of data over another, the specific rationale applied will be explained in the Integrated Report.

Macroinvertebrate Metrics, Use Of Family Level Indices Vs. Genus Level Indices (NJIS vs. CPMI and HGBI): As stated earlier in Section 4.3, the Department will continue to use biological assessment results based on the family level macroinvertebrate NJIS index in non-Pinelands waters, if they are submitted by other entities; however, where assessment results based upon the newly developed, genus level metrics (HGBI and CPMI) are available, these results will override those based upon family level metrics when assessing aquatic life use attainment for the entire assessment unit.

Modeling and Sampling Results: Water quality models may be used to predict changes in water quality over time under different flow, weather, and temporal conditions. In considering use of modeling results (such as those generated in TMDL studies) to assess compliance with SWQS criteria, the Department will evaluate the results on a case-by-case basis to determine if they should be considered with equal weight as actual sampling data.

Shellfish Classification Data: The Department will review shellfish classification data to determine if the harvest restrictions were transient anomalies or a result of something other than water quality issues. The Department will further evaluate the data to ensure that harvest restrictions are not attributed to a specific event requiring enforcement action such as a pipe break, spill, or treatment plant upset. Shellfish harvesting restrictions based on transient anomalies are not considered impairments and are not considered in assessing the shellfish harvest use. Restrictions attributed to events requiring enforcement action will be assessed as not attaining the shellfish harvest use but will not require a TMDL.

Validation of PMI with Pinelands Commission Biological Data: Biological assessments using the macroinvertebrate PMI metric (in PL or FW waters) will be validated by comparing PMI assessments against biological data supplied by the New Jersey Pinelands Commission whenever both data sets correspond spatially. The Pinelands Commission maintains records of species presence/absence data for stream vegetation, fish, and anuran populations. These data are evaluated based upon the degree of human ("cultural") disturbance within the various Pinelands watersheds where degrees of disturbance are inferred from the presence or absence of Pinelands and non-Pinelands species in these watersheds. The absence or relatively small percentage of non-Pinelands species, in concert with a diverse representation of Pinelands species, reflects low levels of cultural disturbance. Larger percentages of non-Pinelands species, along with declining diversity of Pinelands species, reflect higher levels of cultural disturbance. Until the Department has validated PMI results using Pinelands Commission data, the Department will assess the aquatic life use as attained only where PMI results are either "excellent" or "good" and land use data shows little or no development. Otherwise, the Department will conclude that "insufficient data" is available with which to assess the use.

6.0 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;
- industrial water supply; and
- agricultural water supply.

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

The Department has identified the parameters that are used to assess each designated use (see Appendix A). Sufficient data for every parameter are not always available; therefore, a minimum suite of parameters necessary for assessing each designated use has also been specified. Table 6.0 identifies the minimum suite of parameters necessary to assess each designated use. However, data for the entire minimum suite of parameters are only necessary to conclude that the designated use is attained. Specifically, an assessment unit will be assessed as attaining the designated use if data for the entire minimum suite of parameters are available and the data indicate that there are <u>no</u> impairments or exceedances (Sublist 1 or 2). If data for any one parameter associated with a designated use (Appendix A parameters) indicate any impairment or exceedance, even if data are available for only some of the minimum suite of parameters, then the assessment unit will be assessed as not attaining the designated use (Sublist 4 or 5). If data are available for only some of the minimum suite of parameters and the data indicate that there are no impairments or exceedances, then the assessment unit will be identified as having insufficient information with which to assess the designated use (Sublist 3).

Table 6.0: Minimum Suite of Parameters for Designated Use Assessments

Designated Use	Data Requirements (Minimum Suite of Parameters)
General Aquatic Life	Biological data. If biological data is not available: • pH, DO, temperature, TP, and TSS (non-tidal waters); or • DO (tidal waters)
Aquatic Life - Trout	Biological data, temperature, and DO. If biological data is not available: • pH, DO, temperature, TP, and TSS
Recreation (Primary and Secondary Contact)	• Enterococcus (SC, SE1 waters) ; • fecal coliform (SE2, SE3 waters) ; or • E. coli (FW2, PL waters)
Fish Consumption	Fish Consumption Advisories for one or more parameters
Shellfish Harvesting	Shellfish Classification
Drinking Water Supply	Nitrate
Ag. Water Supply	TDS and salinity
Industrial Water Supply	TSS and pH

6.1 Aquatic Life Use Assessment Method

The aquatic life use is assessed by directly evaluating biotic communities and assessing the health of the aquatic biota. This direct evaluation is performed using biological information that integrates a full suite of environmental conditions over many months (for macroinvertebrates) to many years (for fish-based indicators). When such data are available, the Department bases its aquatic life use assessments upon metrics developed to assess benthic macroinvertebrate data, in conjunction with fin fish IBI (Index of Biotic Integrity) data, and supplemented with a broad suite of biologically relevant physical/chemical data (e.g., dissolved oxygen, temperature, toxic pollutants). The minimum data sets for biologically relevant physical/chemical data will differ depending on stream classification. For instance, the minimum data set for assessing attainment with the aquatic life use-trout is more extensive than the minimum data set used to evaluate the general aquatic life use (see Table 6.1).

When biological data are not available, the Department must rely on biologically-relevant chemical water quality data alone, such as dissolved oxygen (DO), to indirectly assess the health of the biota, even though chemical water quality data provide only a "snapshot" in time rather than the longer-term assessment supported by biological indicators. Table 6.1 summarizes the possible outcomes of the use assessment for aquatic life based upon various combinations of data and results, including the relative weight attributed to different data sets.

Table 6.1 Aquatic Life Use Assessment Results
Based Upon Individual and Integrated Data Sets

Results of Biological Assessment	Results of Aquatic Life Use Assessment (General and Trout)
Biological Monitoring Data Available, No Chemical/Physical Data Available	
One or more biological data sets indicate no biological impairment	Aquatic life use is attained
One or more biological data sets indicate biological impairment	Aquatic life use is not attained with cause of non-attainment identified as "cause unknown"
Both Biological and Chemical/Physical Data Available	
Biological data indicate no impairment and there are no chemical exceedances and waters are not threatened*.	Aquatic life use is attained
Biological data indicate impairment AND chemical/physical data show exceedances of aquatic life criteria or are threatened*.	Aquatic life use is not attained with the parameter(s) exceeding criteria identified as the cause
Biological data indicate impairment BUT chemical/physical data show no exceedances of aquatic life criteria	Aquatic life use is not attained with cause of non-attainment identified as "cause unknown
Both Biological and Chemical/Physical Data Available	
Biological data indicates no impairment BUT chemical/ physical data show exceedances of aquatic life criteria or waters quality is threatened. *	Aquatic life use is not attained with parameter(s) exceeding criteria identified as the cause.
No Biological Data Available, Chemical/Physical Data Available	
Minimum data requirements not met	Insufficient data to assess aquatic life use
No exceedances of aquatic life criteria	Aquatic life use is attained
Two or more exceedances of aquatic life criteria or water quality is threatened*.	Aquatic life use is not attained with parameter(s) exceeding criteria listed as the cause

*Note: Threatened is defined as chemical/physical data showing no exceedances of surface water quality criteria but degrading water quality trends indicate that criteria are likely to be exceeded within two years
.

As stated earlier, many stream locations are assessed by using both benthic macroinvertebrate data and fin fish IBI data. Because of differences in degrees of pollution sensitivity and differing temporal and spatial scales, assessment results can differ between fish and invertebrates at the same location. When multiple data sets yield contradictory or ambiguous assessment results, the Department will evaluate the strength of the various data sources used to assess aquatic life use attainment. The Department will take into account factors such as age, robustness, and accuracy of the data. Other factors, such as declining trends, may also influence the weight of a given data set.

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, and FW2 waters. SWQS criteria have also been promulgated for secondary contact recreation in SE2 and SE3 waters. Criteria have not been promulgated for secondary contact recreation in FW2, SE1, or SC waters. Therefore, only the more stringent primary contact recreation is assessed for these waters. Primary contact recreation in FW1 and PL waters is assessed using the SWQS criteria for FW2 waters because numeric criteria for recreational use have not been promulgated for FW1 or PL waters.

As explained in Section 4.2 Pathogenic Indicators, assessment for primary contact recreation compares the geometric mean (geomean) of the water quality data for pathogenic indicators to the appropriate SWQS criterion. Exceedance of the numeric SWQS criteria for pathogenic indicators is assessed as not attaining the primary contact recreational use. All sanitary data collected as per the requirements of the geometic mean are used to assess the recreational use, in water both with and without bathing beaches (including coastal waters). "Designated bathing beaches", which are heavily used for primary contact recreation during the recreational season pursuant to the New Jersey State Sanitary Code N.J.A.C. 8:26, are also assessed using beach closure data. Designated bathing beaches are assessed as not impaired if there are no beach closures lasting seven or more consecutive days in a given year, or the average number of beach closures is less than two per year over a five-year period. Short term beach closures (less than one week) generally signify occasional excursions of the pathogen criterion, unless the short term closures occur chronically over several (five or more) years, in which case the beach is assessed as impaired. A week-long beach closure signifies that non-compliance with the pathogen criterion occurred more than once within one week. One beach closure per year of seven or more consecutive days, or an average of two or more beach closures (of any duration) per year over a five-year period, is assessed as not attaining the primary contact recreational use. Table 6.2 summarizes the possible outcomes of the recreational use assessment.

Table 6.2: Recreational Use Assessment Results

Assessment	**Result** (see note below)
Beach closure data does not identify impairment (Primary Contact) <u>and</u> the geometric mean meets SWQS (Primary or Secondary).	Use Is Attained
Beach closure data identifies impairment (Primary Contact) <u>or</u> geometric mean exceeds SWQS (Primary or Secondary)	Use Is Not Attained

Note: In AUs where bathing beaches play a minor role or where several bathing beaches are not impaired and only one is impaired, the Department will look at the water quality of the non-bathing beach areas and the frequency and duration of the SWQS exceedances at the impaired beach before determining the attainment status of the entire assessment unit. In those instances where the Department uses Best Professional Judgment and determines that the impaired beach area is *de minimus* for the assessment unit, the assessment unit will be assessed as attaining the primary contact recreational use and the *de minimus* impaired beach will be identified in the Integrated Report for follow up sanitary surveys required by the DHSS. See Section 5.1 for a more detailed explanation of *de minimus* data.

6.3 Fish Consumption Use Assessment Method

Fish consumption use assessments are based on the presence of fish consumption advisories resulting from site-specific data rather than statewide advisories. The data collection, risk assessment, and issuance of fish consumption advisories are overseen by the New Jersey Interagency Toxics in Biota Committee (ITBC), a joint effort between the Department and the DHSS. Through the ITBC, research projects are coordinated to monitor levels of contaminants in commercially and recreationally harvested fish, shellfish, and crustacean species. Edible portions of individual animals are tested for one or more bioaccumulative chemicals (e.g., polychlorinated biphenyls (PCBs), chlorinated pesticides, dioxins, and mercury). These data are evaluated for development of consumption advisories, as appropriate, to protect human health.

For all contaminants except mercury, the Department follows USEPA's "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories – Volume 1, 2 and 3 (USEPA 2000) for establishing fish consumption advisories. For mercury, the ITBC uses human health risk-based mercury guidelines established by the Department (NJDEP, 1994), which closely follow guidelines recommended by the Year 2000 National Research Council report - *Toxicological Effects of Methylmercury* (Commission on Life Sciences, 2000).

Statewide fish consumption advisories are considered insufficient data upon which to base a fish consumption use assessment, since the Department relies on site-specific data evaluated on an assessment unit basis. Where a site-specific fish consumption advisory has been issued for any portion of an assessment unit, including a lake, the entire assessment unit will be assessed as not attaining the fish consumption use and the assessment unit will be placed on the 303(d) List along with all pollutants responsible for the site-specific consumption advisory(ies).

In addition to fish consumption advisories, the Department will review water column data to determine if there are exceedances of the human health criteria for bioaccumulative chemicals to determine which use is not being attained: the drinking water use, the fish consumption use, or both. Water column concentrations of these constituents that exceed the SE/SC human health criteria, which are based on fish consumption only, will be assessed as not attaining the fish consumption use. Table 6.3 summarizes the possible outcomes of the use assessment for the fish consumption use.

Table 6.3: Fish Consumption Use Assessment Results

Assessment	Result
No fish consumption restrictions in effect	Use is Attained
"No consumption" ban or "Restricted Consumption" of fish is in effect or a fishing ban is in effect for a sub-population for one or more fish species, or if water quality standards are not met. Note: restricted consumption is defined as limits on the number of meals or size of meals consumed per unit time for one or more fish species.	Use is Not Attained
Fish tissue data is not available	Insufficient Data
Statewide fish consumption advisory is in effect based on extrapolated data	Insufficient Data

6.4 Shellfish Harvest Use Assessment Method

The shellfish harvest 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* (NSSP, 2005), is available on the FDA's Web site at www.cfsan.fda.gov/~ear/nss3-toc.html. 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, seasonal, or prohibited harvest. Prohibited, special restricted, and seasonal harvest areas are further separated into waters where shellfish harvest is prohibited due to poor water quality or administrative closures based on land use, resource availability, or sanitary surveys. The legal description of shellfish classification areas is updated annually 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 are established in areas around potential pollution sources, such as sewage outfalls and marinas, as a preventive measure to prevent the harvest of possibly contaminated shellfish. Administrative closures are located in areas immediately adjacent to the sewage treatment plant outfalls in the ocean. In marinas, prohibited areas are established to protect human health from contamination from boat wastes and runoff. Where shellfish harvest is prohibited due an administrative closure that is based on land use (e.g., marinas, treatment plant outfalls, etc.), such prohibited areas will not be included in the overall assessment. Only assessment units containing shellfish waters classified as unrestricted are assessed as attaining the shellfish harvest use. For assessment units that do not attain the shellfish harvest use, the pollutant causing the non-attainment will be identified as fecal or total coliform, as appropriate. Table 6.4 summarizes the possible outcomes of the use assessment for the shellfish harvest use.

Table 6.4: Shellfish Harvest Use Assessment Results

NSSP Classification	Assessment Results*
Unrestricted	Use Is Attained
Prohibited, Special Restricted, or Seasonal classifications based on water quality	Use Is Not Attained

*Note: Assessment units overlie but do not follow shellfish classification boundaries and may contain more than one classification (see Section 5.0). In most instances, the use assessment will be based on the most restrictive classification found within that assessment unit. Where only a *de minimus* portion of the acreage within an assessment unit has some degree of restriction, the assessment will reflect the assessment of the non-*de minimus* area. Any *de minimus* areas that are restricted but are not subject to administrative closures (i.e., the restriction is due to poor water quality) will be identified in the Integrated Report. This assessment method may exaggerate the extent of impairments; therefore, the official adopted Shellfish Classification maps should be referenced for the actual areas approved for shellfish harvest.

6.5 Drinking Water Supply Use Assessment Method

The drinking water supply use is defined as waters that are potable after conventional filtration treatment and disinfection, without additional treatment to remove other chemicals. All waters classified as Freshwater (FW2) and Pinelands (PL) 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. Nitrate concentrations are the minimum data necessary to assess the drinking water use; however, other Appendix A parameters (i.e., arsenic, cadmium, chromium, copper, cyanide, lead, mercury, thallium, zinc, nitrate, TDS, chloride, radioactivity, and volatile organic compounds) will also be used to assess the drinking water use when sufficient data for these parameters is available.

In addition to ambient chemical water quality parameters, the Department uses monitoring data from treated or finished water supplies to determine compliance with the Safe Drinking Water Act's National Primary Drinking Water Regulations (NPDWRs, or primary standards) and water supply use restrictions. 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 closure, contamination-based drinking water supply advisories, better than conventional treatment requirements, and increased monitoring requirements due to confirmed detection of one or more pollutants.

The Department's Bureau of Safe Drinking Water summarizes safe drinking water violations annually. The drinking water use assessment method uses the data provided in these reports. Only violations that can be attributed to surface water sources are considered. Violations for copper and lead, which could 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 use assessment for the drinking water use. Since human health concerns from bioaccumulated constituents are generally addressed through consumption advisories, the

Department will review exceedances of human health criteria for such constituents to determine which use is not being attained: the drinking water use, the fish consumption use, or both.

Table 6.5: Drinking Water Supply Use Assessment Results

Safe Drinking Water Actions	Assessment Results
No closures, use restrictions, SWQS criteria are met and waters are not threatened.*	Use is Attained
Closures are recorded or water quality standards are exceeded or threatened.*	Use is Not Attained
Surface water quality is such that more than conventional treatment is required	Use is Not Attained
Contamination-based drinking water supply advisories are in effect	Use is Not Attained
Increased monitoring requirements are in effect due to confirmed detection of one or more pollutants	Use is Not Attained

*Note: Threatened is defined as chemical/physical data showing no exceedances of surface water quality criteria but degrading water quality trends indicate that criteria are likely to be exceeded within two years.

6.6 Industrial Water Supply Use Assessment Method

Industrial water supply use assessment is conducted for waters used for industrial processing or cooling. The Department will use total suspended solids (TSS) and pH, a measure of acidity, as indicators for assessing attainment of the industrial water supply use. A pH range of 5 to 9 will be used as a threshold for use attainment.

6.7 Agricultural Water Supply Use Assessment Method

The agricultural water supply use includes irrigation and livestock farming. Only waters classified as FW2 and PL are designated for this use. Numeric SWQS criteria have not been promulgated for the agricultural water supply use. The "No increase in background which would interfere with the designated or existing uses, or 500 mg/L, whichever is more stringent" criteria stated in the Surface Water Quality Standards was promulgated to protect drinking water uses. In order to evaluate water supplies that support agriculture in New Jersey, guidelines are referenced from the U.S. Department of Interior Natural Resources Conservation and other states (Follet, 1999 and Bauder, 1998). These guidelines are used to evaluate whether water supplies support common agricultural uses such as irrigation and raising livestock. For the assessment, total dissolved solids (TDS) and salinity were selected as indicators of agricultural use. Salinity was chosen due to its adverse and immediate detrimental effects on all agricultural practices. TDS has similar negative effects and also indicates possible contamination from runoff. The more stringent of the recommended standards for irrigation and livestock is applied in the assessment of the agricultural water supply use. Acceptable levels for TDS and salinity were established as at or below 2,000 mg/l (Follet, 1999). If TDS or salinity data are not available, specific conductance is used as a surrogate with a specific conductance of 3,000 us/cm approximately equivalent to TDS and salinity levels of 2,000 mg/l (United Nations, 1985). Toxics are also a primary concern for agricultural water supply uses; however, the State's criteria for toxics apply to human health and aquatic life protection, which are more stringent than the criteria needed for agricultural use. Several other states have established criteria for agricultural uses and further research will be done to evaluate the feasibility of applying their criteria to assess attainment of the agricultural water supply use in New Jersey.

7.0 Integrated Listing Guidance

The 2006 Integrated Report Guidance (USEPA, 2005, supplemented by October 12, 2006 memo) recommends placing assessment results into one of five specific categories on the Integrated List. Based on this guidance and the Department's listing methodology (explained in Section 1.1), the five sublists used to identify an assessment unit on the Department's 2008 Integrated List are described below.

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

Sublist 2: The assessment unit is attaining the designated use but is not attaining another/other applicable designated use(s).

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

Sublist 4: One or more designated uses are not attained or are threatened but TMDL development is not required because (three sub-categories):

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

Sublist 5: One or more designated uses are not attained or are threatened by a pollutant(s), which requires development of a TMDL.

7.1 Integrated Listing Methodology

The Department will develop the Integrated List by assessment unit/designated use combinations, not just by assessment unit. This will enable the Department to assign each designated use in each assessment unit to the appropriate sublist; however, it also means that some assessment units will be assigned to multiple sublists.

Table 7.1 describes how the results of the individual designated use assessments will be integrated to determine the listing assignment for each assessment unit/designated use combination. Because the same pollutant could result in multiple designated uses being assigned to Sublist 5, the Department will identify, on a separate List of Water Quality Limited Waters (303(d) List), the pollutant(s) causing non-attainment of the applicable designated use(s) for each assessment unit assigned to Sublist 5. For example, exceedances of mercury could result in the same assessment unit being assigned to Sublist 5 multiple times for not attaining the aquatic life use, the drinking water use, and the fish consumption use. The assessment unit would be listed once on the List of Water Quality Limited Waters (303(d) List) as not attaining its designated uses because of mercury. However, the same assessment unit may also appear on the 303(d) List multiple times, if there are other pollutants causing non-attainment of the same use or other designated uses. Thus, the 303(d) List will provide a more accurate picture of the number of different TMDLs needed to address pollutants causing non-attainment.

Pursuant to the Section 303(d) of the federal Clean Water Act (CWA), and in collaboration with the states, USEPA provided a voluntary approach to listing waters not attaining their designated uses because of mercury from atmospheric sources. This approach acknowledges the complexities involved in addressing non-attainment due to atmospheric deposition of mercury and encourages and recognizes states that are reducing sources of mercury through state programs and that achieve early environmental results (e.g., by identifying sources of mercury and implementing pollutant controls prior to TMDL development). Under this voluntary approach, a state that has already instituted a comprehensive mercury reduction program may utilize USEPA's sublist category "5M" to identify assessment units that do not attain their designated uses because of atmospheric mercury and may assign low priority to development of mercury TMDLs for these assessment units on the state's TMDL schedule. As recognized in previous USEPA guidance, states may still utilize their own state-defined subcategories to further define use assessment results on their Integrated Lists.

If the Department chooses to use the 5M category on the 2008 Integrated list, the Integrated Report will identify which elements of the voluntary approach are being implemented in New Jersey, such as already implementing a comprehensive mercury reduction program; demonstrating progress already achieved in reducing the mercury loadings over which the State has control; identifying which assessment units in New Jersey are not attaining their designated uses primarily because of atmospheric deposition of mercury, and the emission sources believed to be contributing to that deposition; identifying regulatory and non-regulatory controls that could be implemented; and describing monitoring, reporting efforts, and implementation schedules for those controls.

The 5M approach does not remove the obligation to develop TMDLs for waters that are not attaining designated uses because of mercury if such mercury reduction programs do not result in attainment of SWQS criteria. TMDLs continue to be valuable tools for states to identify and quantify the sources of mercury to a waterbody, including air deposition, and to determine specifically what reductions are needed to meet water quality standards. The Department is evaluating whether or not a sublist 5M is appropriate for New Jersey at this time.

Table 7.1: Integrated Listing Method

Sublist	Assessment Results
Sublist 1: All designated uses are assessed and attained, with the exception of fish consumption.	Full Attainment (All Uses Are Attained)
Sublist 2: The designated use is attained but other designated uses within the assessment unit are either not assessed due to insufficient data or not attained.	Use Attained
Sublist 3: Insufficient data is available to determine if the designated use is attained.	Insufficient Data
Sublist 4a: The designated use is not attained or is threatened and development of a TMDL is not required because a TMDL for the parameter responsible has already been approved by USEPA.	Use Not Attained (TMDL Not Required)
Sublist 4b: The designated use is not attained or is threatened and development of a TMDL is not required because other enforceable pollutant control measures are reasonably expected to result in the attainment of the designated use in the near future.	Use Not Attained (TMDL Not Required)
Sublist 4c: The designated use is not attained or is threatened and development of a TMDL is not required because the cause was attributed solely to pollution, not pollutant(s).	Use Not Attained (TMDL Not Required)
Sublist 5: The designated use is not attained or is threatened by a pollutant and development of a TMDL is required.	Use Not Attained (TMDL Required)

7.2 Identifying Causes and Sources of Non-attainment (303(d) List)

In assessing use attainment, the Department's primary focus is the evaluation of all readily available data and information (see Chapter 3). Site-specific data meeting QA/QC requirements (see Section 3.1) may be used to identify the cause (pollutant) of non-attainment. Some of that information may include knowledge of conditions known or likely to be the source of a pollutant or impairment. In some cases, monitoring staff may have knowledge of particular discharges or land use conditions that could potentially be the source of the pollutants, but they lack specific information or resources to conduct a thorough investigative study to verify causes and sources. Thus, it is not unusual for the source and cause of biological impairment, or the source of the pollutants causing non-attainment, to be unknown. When there is definitive information regarding the cause of non-attainment (i.e., a specific pollutant), it will be identified on the 303(d) List. If the cause is unknown, the cause will be identified on the 303(d) List as "cause unknown". Sources of pollutants and impairment causing non-attainment are identified based on the best estimations of Department staff. Once an assessment unit is identified on the 303(d) List and is scheduled for TMDL development, a more thorough investigative study will be conducted to determine the cause, if previously unknown, and the sources of the pollutant. These investigations may include but are not limited to more intensive ambient water quality sampling, aquatic toxicity studies, sediment, or fish tissue analysis and/or dilution calculations of known discharges.

7.3 Delisting Assessment Unit/Pollutant Combinations

For assessment unit/pollutant combinations identified on the List of Water Quality Limited Waters (303(d) List), there are numerous scenarios that could result in an assessment unit being removed from this list (i.e., "delisting"). The delisting codes and descriptions have been modified from the 2006 Methods Document to be consistent with the terminology used in USEPA's Assessment Database (ADB) used for reporting final results to USEPA. Some scenarios that could result in the removal of an assessment unit/pollutant combination are explained below in Table 7.3. The reason for any delisting reflected in the 2008 Integrated List will be documented in Appendix C of the 2008 Integrated Report.

Table 7.3: Delisting Definitions

Delisting Code	Delisting Description	Delisting Definition
1	SWQS are met	**Delisting:** Applicable SWQS are being met because water quality has been restored.
2	Flaws in original listing	**Delisting**: Applicable SWQS are being met and the assessment unit/parameter combination was incorrectly listed in a previous 303(d) list.
3	TMDL Alternative (4b)	**Delisting but still impaired:** Assessment unit/parameter combination is not attained but development of a TMDL is not required because water quality will be restored by control measures for point and/or nonpoint sources.
4	Not caused by a pollutant (4c)	**Delisting but still impaired:** Assessment unit/parameter combination is not attained but development of a TMDL is not required since the cause is something other than a Clean Water Act pollutant, such as flow alteration.
5	TMDL approved or established by USEPA (4a)	**Delisting but still impaired:** Assessment unit/parameter combination is not attained but development of a TMDL is not required because a TMDL has already been approved or adopted by USEPA.
6	Waterbody not in State's jurisdiction	**Delisting:** Assessment unit/parameter combination was incorrectly included on a previous 303(d) List.

Delisting Code	Delisting Description	Delisting Definition
7	Other	Code not currently used by NJDEP.
8	Applicable SWQS met due to restoration activities	**Restoration:** Applicable SWQS are being met because water quality has been restored due to restoration activities.
9	Amended SWQS	**Restoration:** Applicable SWQS are being met due to amendments to the SWQS adopted since the previous assessment.
10	Applicable SWQS are met according to new assessment method	**Restoration:** Applicable SWQS are being met based on the results of a new assessment method.
11	Applicable SWQS are met; original basis for listing was incorrect	**Restoration:** Assessment unit/parameter combination is found to attain the applicable SWQS because the original basis for the decision was incorrect. (Examples: Natural conditions, flow- related decisions, narrative criteria compliance such as "Exit Ramp" studies)
12	Applicable SWQS met; threatened water no longer threatened	**Restoration:** New Jersey is not using this category.
13	Applicable SWQS met; reason for recovery unspecified	**Restoration:** Assessment unit/parameter combination is currently found to meet the applicable SWQS but the reason for water quality improvement is unknown.
14	Data and/or information lacking to assess compliance with the applicable SWQS - original basis for listing was incorrect	**Delisting**: Assessment unit/parameter combination was incorrectly included on a previous 303(d) List; however, there is insufficient information to assess compliance with applicable SWQS.

8.0 Method to Rank and Prioritize Assessment Units That Are Not Attaining Designated Uses

Section 303(d) of the federal Clean Water Act requires states to rank and prioritize assessment units that require development of TMDLs (i.e., assessment units identified as Sublist 5). 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. The Department will prioritize assessment units identified on the 303(d) List and schedule them for TMDL development based on the following factors:

- Importance of pollutants of concern (refer to Table 8.0);
- TMDL complexity;
- Status of parameter (actively produced or legacy pollutant);
- Additional data and information collection needs;
- Sources of pollutants;
- Severity of the actual or threatened exceedance/impairment;
- Spatial extent of the exceedance/impairment;
- Nature of the designated uses not being attained (i.e., recreational, economic, cultural, historic, and aesthetic importance);
- Efficiencies of grouping TMDLs by drainage basin or parameter;
- Efficiencies related to leveraging water quality studies triggered by NJPDES permit renewals;
- Status of TMDLs currently under development;
- Timing of TMDLs for shared waters;
- Status of watershed management activities (e.g., priority watershed selection or 319 grant activities);
- Status of other ongoing pollutant/pollution control actions that could result in water quality restoration (e.g., site remediation activities);
- Existence of endangered and sensitive aquatic species;
- Recreational, economic, cultural, historic and aesthetic importance; and
- Degree of public interest and support for addressing particular assessment units.

Table 8.0: Importance of Pollutants of Concern

Pollutant of Concern	Importance
Pathogen indicators, nitrate	Direct human health issues
Metals and Toxics	• Direct human health issues • Designated use impacts
Other conventional pollutants such as phosphorous, pH, dissolved oxygen, temperature, total dissolved solids, total suspended solids, unionized ammonia	• Significant designated use implications • Indirect human health issues

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 attainment units, and 2) support development of TMDLs for all assessment unit/pollutant combinations identified as not attaining designated uses. New Jersey's 2008 Integrated Report will identify its future monitoring plans and needs in Appendix H: New Jersey's Water Monitoring and Assessment Strategy, as well as in Chapter 9 Next Steps: Preparing for 2010 and Beyond. Chapter 9 of the 2008 Integrated Report summarizes the information gaps and steps the Department is taking to bridge data gaps and improve assessment methods.

The Department's goal for water monitoring and assessment is to ultimately have enough data to assess every designated use in every assessment unit and for assessment results to indicate that ever assessment unit is in full attainment, i.e., attaining every applicable designated use (except fish consumption). It is important to recognize that monitoring and assessing each assessment unit will require significant effort and can only be accomplished over the long term. Several strategies will be key to accomplishing this goal including:

- Exchanging and using data and assessments from other programs within the Department and other entities (e.g., local government, volunteer monitoring groups);
- Expanding ongoing and planned monitoring and assessment to address data limitations for assessment units assigned to Sublist 3.

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 of and comment on the proposed assessment methods; and 3) review of 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.

The New Jersey Water Monitoring Coordinating Council was established on October 24, 2003 and serves as a statewide body to promote and facilitate the coordination, collaboration, and communication of scientifically sound, ambient water quality and quantity information to support effective environmental management. The Council consists of representatives from various Divisions within the Department; USGS; USEPA Region 2; the Delaware River Basin, Pinelands, and Meadowlands Commissions; the Interstate Environmental Commission; county health departments, academia; and the volunteer monitoring community, and provides the opportunity to exchange information and data among its participants.

The Department, through its Volunteer Monitoring Program, has been working to identify volunteer groups that collect data and are interested in submitting it for use in Integrated Reports. The Watershed Watch Network serves as an umbrella organization for all of New Jersey's volunteer monitoring programs. Volunteer monitoring program managers throughout the State make up the Watershed Watch Network Council. A four-tiered approach has been developed to allow volunteers to pick their level of involvement based on the purpose of their monitoring program, the intended data use, and the intended data users. The goal of this program is to provide acceptable protocols and QA/QC requirements for volunteers who choose to submit their data to the Department, assist volunteers in designing and building upon their existing programs, and assist data users in gathering sound data for their desired uses. Additional information on the four-tier volunteer monitoring approach is available on the Department's Web site at http://www.state.nj.us/dep/wms/bfbm/vm/index.html.

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 Integrated List component of the Report, which categorizes the results of use assessments for all the State's assessment units into sublists (Sublists 1 through 5), satisfies the reporting requirements of Section 305(b) formerly addressed by the Statewide Water Quality Inventory Report. The 303(d) List component of the Report, which satisfies the reporting requirements of Section 303(d), includes the assessment units identified as not attaining one or more designated uses (Sublist 5), the pollutants causing non-attainment 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 categorizing assessment units into the five sublists of the Integrated 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 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, public notices published in newspapers of general circulation, announcements published in Department-generated newsletters, and direct mailings to interested individuals and organizations. The six-month time period for submitting data is specified in the public notice. A cut-off date for submission of data is established 15 months prior to the Department's deadline for completing the Integrated Report (usually April 1st of even-numbered years). This is consistent with the neighboring States of Delaware and Pennsylvania, as well as the Delaware River Basin Commission. 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. If data arrives past the cut-off date for the current report, it will be considered for the next report.

In determining which data are appropriate and readily available for assessment purposes, the Department will consider quality assurance/quality control, monitoring design, age of data, accurate sampling location information, data documentation, and use of electronic data management (see Chapter 3). A data package submitted to the Department for use in the Integrated Report should include:

- The approved quality assurance project plan (see Section 3.1 Data Quality)
- Data provided in electronic format. The Department prefers that all data be entered into USEPA's STORET database. Volunteer organizations may also submit data through the Department's new data management system for volunteer monitoring data at http://www.state.nj.us/dep/wms/bfbm/vm/database.html.
- The Department is aware that USEPA is moving away from the STORET Data Management model and towards a new standard for water quality data exchange. The Department is currently developing tools and a Web-based system for this exchange and expects to have the enhanced data exchange process in place for the 2010 Integrated Report.
- Station location data should be provided in a GIS shape file or compatible format when possible. Station locations identified by latitude and longitude must also be mapped on a

USGS Quadrangle Sheet (or copy of a section of a sheet with the name of the sheet identified); and,
- A citable report summarizing the data that includes name, address, and telephone number of the entity that generated the data set.

The Department is working with data-generating organizations to organize their data, provide training in acceptable sampling techniques, and certify laboratories and field measurement protocols. Additional information is available on the Department's Volunteer Monitoring Web site at http://www.state.nj.us/dep/wms/bfbm/vm/index.html.

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 shall propose the 303(d) List of Water Quality Limited Waters as an amendment to the Statewide Water Quality Management Plan, provide an opportunity for public comment, and adopt 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, on the Department's Web site, and in newspapers of general circulation throughout the State. Adjacent state, federal, and interstate agencies shall also be notified, as necessary. The public notice shall include the following:

- 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.

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 shall be published promptly on the Department's Web site.

Final Action: After the close of the public comment period for the Methods Document, the Department will address the comments and publish 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 List of Water Quality Limited Waters, the Department will address the public comments, make any necessary revisions, and prepare a final List of Water Quality Limited Waters. The Department will submit the final List of Water Quality Limited Waters 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 will adopt the List of Water Quality Limited Waters 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 repropose the List of Water Quality Limited Waters, 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 will include the Integrated List, monitoring needs and schedules, TMDL needs and schedules, and any other information usually included in the 305(b) Report, will be submitted to the USEPA Region 2 as required by Section 305(b) of the federal Clean Water Act. The Department will post the availability of the Integrated Report on its Web site at that time.

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Appendix

A listing of all the parameters the Department might use in the assessment process and the designated uses associated with each parameter.

Parameter	Aquatic Life (general and trout)	Recreation	Drinking Water Supply	Agricultural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consumption
Biological Community Data:	X						
Fish Advisories (contaminants in tissue only)							X
Shellfish Closures						X	
Beach Closure Data		X					
Dissolved Oxygen	X						
Enterococci (saline)		X					
Fecal Coliform (saline)						X	
E.Coli (freshwater)		X					
Total Coliform						X	
pH (Standard Units)	X		X		X		
Phosphorus, Total	X						
Solids, Suspended (TSS)	X				X		
Salinity				X			
Solids, Total Dissolved (TDS)			x	X	x		
Sulfate			X				
Temperature	X						

Parameter	Aquatic Life (general and trout)	Recreation	Drinking Water Supply	Agricultural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consumption
Turbidity	X						
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				X
Asbestos			X				
Barium			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
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	Drinking Water Supply	Agricultural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consumption
Bromodichloromethane (Dichlorobromomethane)			X				X
Bromoform			X				X
Butyl benzyl phthalate			X				X
Cadmium	X		X				X
Carbon tetrachloride			X				X
Chlordane	X		X				X
Chloride	X		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				
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	Drinking Water Supply	Agricultural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consumption
Dibromochloromethane (Chlorodibromomethane)			X				X
Di-n-butyl phthalate			X				X
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
Endosulfans (alpha and beta)	X		X				X
Endosulfan sulfate			X				X
Endrin	X		X				X
Endrin aldehyde			X				X

Parameter	Aquatic Life (general and trout)	Recreation	Drinking Water Supply	Agricultural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consumption
Ethylbenzene			X				X
Fluoranthene			X				X
Fluorene			X				X
Guthion	X						
Heptachlor	X		X				X
Heptachlor epoxide	X		X				X
Hexachlorobenzene			X				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	X		X				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

Parameter	Aquatic Life (general and trout)	Recreation	Drinking Water Supply	Agricultural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consumption
N-Nitrosodi-n-butylamine			X				X
N-Nitrosodiethylamine			X				X
N-Nitrosodimethylamine			X				X
N-Nitrosodiphenylamine			X				X
N-Nitrosodi-n-propylamine (Di-n-propylnitrosamine)			X				X
N-Nitrosopyrrolidine			X				X
Parathion	X						X
Pentachlorobenzene			X				X
Pentachlorophenol	X		X				X
Phenol			X				X
Phosphorous (yellow)	X						
Polychlorinated biphenyls (PCBs)	X		X				X
Pyrene			X				X
Selenium	X		X				X
Silver	X		X				X
Sulfide-hydrogen sulfide (undissociated)	X						
1,2,4,5-Tetrachlorobenzene			X				X
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)			X				X
1,1,2,2-Tetrachloroethane			X				X
Tetrachloroethylene			X				X
Thallium			X				X
Toluene			X				X
Toxaphene	X		X				X

Parameter	Aquatic Life (general and trout)	Recreation	Drinking Water Supply	Agricultural Water Supply	Industrial Water Supply	Shellfish Harvest	Fish Consumption
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
Vinyl chloride			X				X
Zinc	X		X				X
Radioactivity			X				

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Response to Comments on NJDEP's "Draft 2008 Integrated Water Quality Monitoring and Assessment Methods"

Commenters:

1. USEPA Region II
2. Pinelands Commission

1. Comment: The Department should provide a summary table in this document of the following for each water resource type: sampling design approach (probabilistic, judgmental, etc.), designated use addressed, indicators used, and particulars such as frequency of sampling, numbers of stations and what percent of the resource is covered statewide. (1)

Response: The Methods Document delineates how the Department will evaluate monitoring data to assess waters for designated use support as per CWA 305(b) and 303(d) requirements. Much of the information requested by the commenter has been presented in "New Jersey's Water Monitoring and Assessment Strategy" which is updated periodically and referenced as an appendix in the Integrated Report. In addition, a Data Source Table is provided in the Integrated Report summarizing all the data providers, contact information, purpose of the data collection, data type, waterbodies covered, the number of stations and the parameters sampled.

2. Comment: The commenter notes that probabilistic information is not used for CWA 303(d) listing purposes but the Department now has access to data that have been collected using probability-based designs (lakes and estuaries), so true spatial extent of impairments (statewide) can be reported. The Department should describe these designs (number of stations, confidence levels) and the data analysis and assessment process for these results. (1)

Response: This Methods Document outlines the procedures for using data to develop the Integrated List of Waterbodies. Although the Department does review and utilize probabilistic data for 305 (b) type statewide assessments, it does not use probabilistic monitoring for listing purposes and therefore has not included a discussion of this type of monitoring in the Methods Document. There is a section dedicated to the use of probabilistic monitoring in the Integrated Report which explains trends and statewide use of this information. In some instances, sufficient data has been collected at probabilistic sites that can be combined with non probabilistic data. In these instances, assessment of the data follows the same procedures as data collected in a non probabilistic design.

3. Comment: The use of such a large watershed (Hydrologic Unit Code 14) as an assessment unit masks the individual stream or impoundment site assessment scores contained within the unit. Furthermore, listing each HUC-14 subwatershed by the site with the lowest level of impairment (i.e., worst case scenario) and displaying such in a color figure is misleading and overemphasizes degradation throughout the state. (1)

Response: The Department agrees that listing and displaying impairments in this fashion can obscure or mask the precise location and nature of listed impairments and that map displays as described by the commenter can be somewhat misleading. This Department has found that the identification of every station and impoundment as a unique assessment unit had resulted in several thousand assessment units which became impractical to assess and track. However, the average size of a HUC-14 in New Jersey is 8.5 sq. miles. The Department has found this size to be effective for cataloging impairment information for the purposes of tracing 303(d) listed waters through time.

4. Comment: Page 9. "For chronic aquatic life criteria, the Department considers exceedances that occur only under high flow conditions lasting less than four days to meet the water quality criteria. For human health carcinogens, the Department uses a long term average of the data to determine whether the criteria are met." The SWQS is written as having flow at or above the minimum flow. This does not translate into "high flow" which, when assessing metals for instance, means during storm events. Please explain. (1)

Response: The purpose of this provision is related to duration, not high flows. The chronic aquatic life criteria are expressed as a four-day average. Excursions occurring under high flow conditions as reflected in "grab samples" that represent exposures of less than four days fail to generate the necessary exposure <u>duration</u> to generate an exceedance. No change was made in the Methods document.

5. Comment: Page 9: "The Department will take into consideration the precision of the analytical method used to measure the data. When data are above a criterion but within the precision error of the method, the sample result meets the criteria." Please provide more detail on how and when this method could be used. (1)

Response: Using Total Phosphorus for an example, the precision for Total Phosphorus analysis in the NJDEP laboratory is +/– 0.015 mg/l. This means that a reported value of 0.115 could actually be meeting the criterion of 0.1 mg/l. Therefore, the Department will only consider a value as a violation when it is outside of the precision error of the analysis.

6. Comment: The Department should explain the statement on page 9 which states "The Department has established the SWQS in a conservative manner so that an occasional digression will not impair aquatic life or human health", in particularly, as to how it relates to the methods being outlined in the document. (1)

Response: The Department has removed this language in the final version as the statement did not have a direct relationship to the assessment methods.

7. Comment: Please define a "minor excursion."(1)

Response: The Department has clarified the term "excursion" in the Chapter 4 overview summarized in Chapter 2 and no longer uses the term "minor excursion".

8. Comment: The method outlined on page 10 for assessing dissolved oxygen data from continuous monitors is not consistent with the current SWQS. (1)

Response: The SWQS were written when data was collected via grab samples. Today, dissolved oxygen data is more and more commonly being collected using datasondes and other continuous sampling devises. Data is collected at various time intervals including 15 minutes, half hour and 1 hour intervals. The Department's methodology allows the use of data collected under different time intervals to be assessed in a comparable manner. Within a single one hour period - any single contravention of a criterion, be it in a 15, 30, or one hour monitoring interval, will be treated as an excursion

9. Comment: Page 12, the link to additional info on the Pinelands Macroinvertebrate Index does not have that information. (1)

Response: The link has been removed.

10. Comment: The 5 Kilometer buffer displayed in Figure 4.3 appears to surround the State designated Pinelands Area, not the Pinelands National reserve as described in the text. The Pinelands Natural Reserve boundary extends beyond the Pinelands area boundary. (1)

Response: The Department intended to refer to the Pinelands Area, specifically the areas designated as such by section 10(a) of the Pinelands Protection Act and not the National Pinelands Reserve. The page has been revised.

11. Comment: The Department should provide more information regarding the details of making assessment decisions when there exist different types of relevant biological data for a waterbody, especially when these different sets of biologic data conflict.(1)

Response: Section 5.1 in the Methods Document entitled **"**Additional Considerations When Combining Data from Multiple Stations within an Assessment Unit" has undergone extensive revisions to clarify how multiple datasets are used to produce a biological assessment for the 2008 List.

12. Comment: The Department should provide more information regarding how the lakes fishery data will be used in assessments. (1)

Response: The Department has amended its lake assessment methodology and will not be using fishery data to assess use attainment in lakes in the 2008 Integrated List.

13. Comment: The 2008 assessment will evaluate each lake based on the "actual or potential recreational value as a fishery" rather than its ecological value. Several fish species considered important for recreation in New Jersey, e.g., largemouth bass (Micropterus salmoides) and bluegill (Lepomis macrochirus), are not native to the Pinelands region. Because Pinelands lakes are stream impoundments that reflect upstream watershed conditions, the presence of nonnative fish populations in Pinelands impoundments is indicative of watershed degradation, which is likely to be contrary to a lake assessment based only on the value as a fishery. (2)

Response: See response to Comment 12 above.

14. Comment: Section 5.1 states: "Modeling results are able to predict water quality over longer periods of time and under different flow, weather, and temporal conditions usually resulting in a better picture of existing water quality. The Department will evaluate each model to ascertain whether or not it should have more weight than actual sample data." Please explain how and when the Department expects to use model projections rather than ambient data to make CWA 303(d) listing-related decisions. (1)

Response: In areas such as the NY/NJ Harbor, extensive resources are being spent to model ambient conditions over long periods of time. Upon completion, calibration and validation of a model, model projections and hard data may not always agree. When a model is determined to adequately predict water quality, it may be used in place of ambient water quality data.

15. Comment: Table 5.1 shows the process of assessing sites using the PMI and validating sites using Commission data. Because of the narrow view of reference condition in the first category of the table and the arbitrary nature of "slight" versus "significant," we suggest deleting Table 5.1 altogether and simply stating that, "The NJDEP Pinelands Macroinvertebrate Index (PMI) will be validated using Pinelands Commission biological data." The Commission Science Office staff would be willing to meet with NJDEP staff to validate the assessments based upon the PMI. (2)

Response: The Department has eliminated Table 5.1. However, for the purposes of transparency in our assessment methods, the Department is obligated to add descriptions of how Pinelands Commission data will be used to validate the Department's benthic macroinvertebrate assessments within the text of Chapter 5 and has expanded the text to do so. This Department looks forward to working with the Pinelands Commission in validating benthic assessments.

16. Comment: The Department should clearly state that the procedures for determining designated use attainment and parameter SWQS attainment are different. For instance, the document should state that an exceedance of any SWQS will result in the associated designated use(s) being listed as "non-attained." And, in order for a designated use to be assessed as "attained," the minimum suite of parameters must show attainment for each of the individual SWQS in the minimum suite. If data are not available for any one of these parameters then the designated use status cannot be determined. The commenter suggesta the following wording be added. "However, if data for any one parameter associated with the designated use shows a violation then this is sufficient to determine that a the designated use is not being attained and the use will be identified as non-attaining on Sublist 5. (1)

Response: The Department has added additional language as requested in Chapter 4 under "Minimum Data Set."

17. Comment: When evaluating designated use attainment for toxics, the designated uses of ingestion of water and fish consumption should each receive an assessment decision when evaluating a human health-based (both carcinogenic and noncarcinogenic) SWQS. (1)

Response: The human health criteria for toxic constituents accounts for the drinking water level of exposure, the simultaneous exposure through fish tissue consumption, and the biomagnification potential of the toxic substance, as based upon EPA's published methods for calculating toxic criteria. Hence, both drinking water <u>and</u> fish tissue consumption are accounted for in a toxic substance assessment for human health.

18. Comment: The data requirements for shellfish harvesting in Table 6.0, Section 6.4, and Appendix A should identify total coliform and fecal coliform as the actual parameters being assessed. (1)

Response: Land use, sanitary surveys as well as fecal or total coliform are used to determine the shellfish classifications under the NSSP Program. The Department uses the NSSP shellfish classifications to assess the designated use. Table 6.0 is correct as is. Language was added to Section 6.4 clarifying that fecal or total coliform would be identified as the pollutant for non-attaining waters. Appendix A was also revised to link fecal and total coliform to shellfish harvest.

19. Comment: The shellfish harvest designated use assessment method should make it clear that "prohibited/administrative closure area" may be assessed as full attainment only if there are no ambient data showing impairment of the relevant pathogen standard, if the shellfish harvesting is still an applicable designated use in these areas. (1)

Response: Administrative closures are established in areas around potential pollution sources, such as sewage outfalls and marinas, as a preventive measure. Since shellfish harvest is precluded in these areas regardless of water quality, the Department will not assess the use in these waters. The assessment will be determined based on areas which have the potential to be open for shellfish harvest. The methodology for determining the assessment status for shellfish harvesting has been amended to reflect this assessment method.

20. Comment: N.J.A.C. 7:9B-1.5(3) states that "it is the policy of the State that all fresh waters be protected as potential sources of public water supply." Based on this, it should be reflected in Section 6.0 that the drinking water use will be used for FW-1 waters. (1)

Response: It is the policy of the Department to protect all fresh waters for potential sources of water and has extended that protection to FW1 waters by setting these waters aside for posterity and limiting the development of these watersheds. The Department has not specifically included drinking water as a designated use in FW1 Waters as the Department wanted to discourage water withdrawals from these streams. These areas are primarily headwater streams with limited flow. Large water withdrawals could reduce the flow and impact the natural biota.

21. Comment: Table 6.1 for aquatic life designated use assessment does not provide the designated use assessment result when both biological and chemical/physical data are available and the bio-monitoring data is good but the chemical/physical data show exceedances of the SWQS. (1)

Response: Table 6.1 has been amended to include the following:

Biological data indicates no impairment BUT chemical/ physical data show exceedances of aquatic life criteria	Aquatic life use is not attained with pollutant exceeding criteria identified as the cause.

22. Comment: The minimum data needed to assess attainment of the potable water supply use should include (a) toxic parameters with human health criteria and (b) radioactivity since conventional filtration and disinfection will not remove these substances. (1)

Response: Appendix A identifies all the pollutants which could affect the drinking water use. If data for these parameters is available, it will be used to assess use attainment. However, it is not possible to have all parameters at all stations. The minimum dataset allows the Department to make some assessment of the designated use when data for all parameters is not available. The Department has collected data on radioactivity in the past and has determined that this parameter is not commonly found at levels in surface water supplies which would cause the designated use to be assessed as not attaining.

23. Comment: In Table 6.5, please provide more detail to explain the Safe Drinking Water actions “contamination-based drinking water supply advisories” and “increased monitoring requirements due to confirmed detection of one or more pollutants.” This additional detail must make clear why these data are insufficient to make a drinking water use assessment. (1)

Response: Contamination-based drinking water supply advisories and increased monitoring requirements due to confirmed detection of one or more pollutants are used with other data to assess this use. Table 6.5 has been corrected.

24. Comment: Please describe the rationale for using “one beach closure per year of 7 or more consecutive days or an average of 2 or more beach closures per year over a five year period” to identify beaches not meeting SWQS. (1)

Response: This closure policy is based upon the DEP assessment policy of requiring 2 violations to confirm impairment. Beaches are initially sampled on Monday and if there is a violation, a confirmatory sample is taken the following Wednesday. A week long closure signifies that there were 2 violations within the week for a beach (both on Monday and Wednesday). In contrast, short term closures of less that a week signify only occasional excursions of the sanitary criterion except in cases where these short term closures occur chronically over several years whereupon they are deemed to reflect non attainment of the use. This paragraph has been added to the Methods Document.

25. Comment: If a very large data set is available, the Department evaluates the frequency of the violations and other available data to determine whether or not they are minor excursions. Until the SWQS are changed, the Department needs to explain that the second hit is a confirmatory hit or in some other way is used by NJDEP to interpret compliance with any “never-to-exceed” SWQS. (1)

Response: The paragraph in question has been modified to read as follows:
The Department’s language in the SWQS of “shall not exceed” for parameters such as phosphorus or dissolved oxygen was based upon a translation of recommended limits published by EPA based upon the existing best professional judgment. These limits were not designed to be treated as a “never to exceed” in the Standards. A single transgression of a criterion in a dataset of 8 or a few transgressions of short duration over an extensive time period will not result in an impaired of the designated use. Based on this the Department has established a minimum of two exceedances of a SWQS in the five year period to confirm impaired waters with the following exceptions: for aquatic life toxics, the allowable frequency of exceedances is two exceedances in three years and for human health carcinogens, the long term average concentration must exceed the criteria. If a very large data set is available, the Department will further evaluate the frequency of the violations and other available data to determine whether or not they are minor excursions.

26. Comment: Although the Department has included the use of deminimis areas in its methods, no deminimis areas were identified on the 2006 CWA 303(d) list. When an area is identified as deminimis and not placed on the CWA 303(d) list, USEPA intends to look at the specifics and discuss the appropriateness of listing with the Department. (1)

Response: Comment noted.

27. Comment: Where a previous listing for impaired biology identifying benthic macroinvertebrate as the pollutant is to be changed to specific parameter, please include language which specifies the parameter to be used must have an aquatic life impact. (1)

Response: Section 7.3 (8) specifically states that the term benthic macroinvertebrate has been replaced with a specific aquatic life pollutant. If no aquatic life pollutant is exceeded, it will be replaced with "cause unknown. The parameters associated with the aquatic life use are listed in Appendix A.

28. Comment: EPA has received TMDLs for approval which use monitoring data which represent only a portion of the 303(d) listed HUC. Only the geographic extent of the watershed receiving the TMDL will be moved from Sublist 5 to Sublist 4A. Therefore, NJDEP needs to identify a protocol for delisting this fragmented HUC area and for dealing with fragmented HUC areas for future assessment. (1)

Response: TMDLs will be performed on a full HUC basis; hence, subdividing waterbodies will not be necessary.

29. Comment: The methods document should provide additional discussion of the state's method for determining when natural conditions would be the cause of a water not meeting the numeric water quality criteria. (1)

Response: The methods document identified the SWQS's allowance for natural conditions to prevail. The concept of "natural causes" is applied when the Department can document that there are no anthropogenic sources contributing to the contaminate in question. When the Department identifies a general area where natural conditions apply, it will discuss the assessment process in the methods document as it does for low pH in the coastal plain area. Where natural conditions are used for a specific station and parameter, the station and parameter are identified in the BPJ document with the Department's rational.

30. Comment: Table 7.1, the description for Sublist 4A should read "The designated use is not attained or is threatened and a TMDL has been adopted established in New Jersey Register and approved by the USEPA." (1)

Response: Table 7.1 has been edited to read: "The designated use is not attained or is threatened and development of a TMDL is not required because a TMDL for the parameter responsible has already been approved by USEPA."

31. Comment: Page 29, "5K" should be replaced with "5,000 ft." (1)

Response: All "Ks" have been changed to Kilometers for clarification.

32. Comment: Page 30. Table 8.0: there should be mention that nitrate is a direct human health issue for the drinking water use. (1)

Response: Changes made as requested.

33. Comment: Section 9.0, Method for Developing the Monitoring and Assessment Plan, describes using "advanced statistical techniques to evaluate water quality in waterbodies that are not sampled based on probabilistic sampling." Are there methods that are planned to be used and what is the advantage? (1)

Response: The statement has been deleted from the Methods Document.

34. Comment: On page 35: The following wording is suggested: A cut-off date after which no additional data or information will be considered in the preparation of the Integrated Report currently being compiled is necessary to allow the data to be received, analyzed and waterbody assessments completed to allow a timely completion of the Integrated Report. If data arrives past the cut-off date for the current report, then it will be considered for the next report. (1)

Response: The suggested language changes have been added for clarification.

35. Comment: Page 36: However, the Department may re-propose the List of Water Quality Limited Segments, if the Department determines that USEPA Region II requests result in substantive changes to the final list that would effectively destroy the value of the original public notice which would require a re-notice to present the changes.(1)

DEP Response: Changes made as requested. See Section 10.2, second paragraph under Final Action

36. Comment: The following items in the parameter column of Appendix A should be adjusted (1):

"Biological data"	Should be broken out into the specific types of biological data that are used: benthic macroinvertebrate survey, fin fish study, etc.
"Fish advisories"	Should specify that only those which represent actual data for pollutants found in specific waterbodies.
"Shellfish closures"	Should specify that the measured parameter is either total coliform or fecal coliform.
"Beach closure data"	Should specify that the measured parameters are Enterococci and E. coli.
"Sulfate"	Does not have an associated designated use.
"Mercury"	Should be associated with fish consumption.

Response: The purpose of Appendix A is to identify the types of data that the Department uses to assess specific designated uses. A violation of any one datum under a designated use is sufficient to render the designated use impaired. The datum biological data was revised to biological community data. All biological community data is used to assess aquatic life use only. The Department feels there is no need to break this category down further. Clarification language has been added to Section 6.3 regarding the use of site specific data for fish advisories. Shellfish classification and beach closures are data types used by the Department to list the use as impaired. The sections on shellfish assessment and recreational use address the pollutants associated with the classifications and closures. Drinking water has been associated with sulfate. Mercury data in and of itself is not used for fish consumption use assessment.

Appendix G
NJ's Water Monitoring and Assessment Strategy (2005-2014)

(The Table of Contents and Executive Summary are provided as Appendix H. The complete document can be found on the Department's website at www.state.nj.us/dep/wmm/longtermstrategyreport.pdf. For further information on this document, contact Water Monitoring and Standards at 609-292-1623)

NEW JERSEY WATER MONITORING & ASSESSMENT STRATEGY (2005-2014)

Water Monitoring and Standards Program
NJ Department of Environmental Protection

Bradley M. Campbell, Commissioner

September 2004

NEW JERSEY WATER MONITORING & ASSESSMENT STRATEGY

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

WATER MONITORING AND STANDARDS PROGRAM

Leslie McGeorge, Administrator
Al Korndoerfer, Chief, Freshwater & Biological Monitoring
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EXECUTIVE SUMMARY

In March 2003, EPA issued national Guidance which identified the key elements for developing a state Water Quality Monitoring and Assessment Strategy to ensure compliance with Clean Water Act requirements. All states are now required, for receipt of 106 grant funds, to develop a comprehensive, 10 year long-term water monitoring strategy.

As the Guidance details, the monitoring program strategy is to cover all waters of the state (streams, rivers, lakes, reservoirs, estuaries, coastal areas, wetlands and ground water). For each waterbody type, the strategy must include discussions of 9 basic elements: 1. Monitoring objectives, 2. Monitoring design, 3. Core & supplemental water quality indicators, 4. Quality assurance, 5. Data management, 6. Data analysis/assessment, 7. Reporting, 8. Programmatic evaluation, and 9. General support and infrastructure planning.

In development of this strategy for New Jersey, the New Jersey Department of Environmental Protection (NJDEP) has performed an assessment of its ambient water monitoring programs based on the Department's water information needs, the EPA Guidance, and the results of the 1999 EPA audit of New Jersey's (NJ) water programs. The resulting document contains long-term strategies for ambient water monitoring and assessment programs that are in various stages of development – from the existing, well established stream monitoring program to the wetlands monitoring program, which is presently in a research and development stage.

The Strategy document is organized by waterbody type (e.g., rivers and streams, lakes and reservoirs). Within each monitoring area, current ambient monitoring programs are described and each of the 9 elements are discussed, the gaps are identified, as well as the resource and technical support needs to fill these gaps. For programs that cross waterbody types (e.g., Toxics in Fish & Shellfish), a separate program description is included. In developing each of the monitoring program strategies, NJDEP considered the 5 overall assessment-related questions, as well as the Core Indicators contained in the EPA guidance document. Key enhancements and/or opportunities for program efficiencies are also highlighted. Because this document is intended to serve as a 10 year plan for NJ's water monitoring and assessment programs, NJDEP has chosen to present its timelines for addressing these gaps in two 5-year intervals (2005-2009 and 2010-2014) so as to highlight short-term vs. long-term plans and needs. As such, all of the implementation plans, particularly the enhancements, are dependent upon availability of resources and needed technical support. An overall summary table of the key gaps and resource/technical support needs is contained in Appendix 3 of the document.

The main elements of the existing New Jersey water monitoring program include:

For freshwater, New Jersey's program includes quarterly sampling of a 115-station ambient stream network. This stream monitoring is a cooperative program between NJDEP and the United States Geological Survbey (USGS). In 2000, a supplemental ambient network for conventional parameters was initiated to provide monitoring at approximately 90 additional ambient sites. The chemical/physical networks monitor conventional parameters, metals, bacteria, pesticides, volatile organic compounds (VOC's) and sediments. Strategic directions identified for these networks include additions of toxic parameters to the supplemental network sites, continuous temperature monitoring at selected sites, and research to evaluate analytical methods for network use that can achieve lower detection limits for arsenic and mercury. The most significant enhancement, the addition of toxic parameters to supplemental monitoring locations, is being addressed in FY2005.

In 1992, NJDEP reactivated its Ambient Biomonitoring Network (AMNET). The network established sampling stations in every sub-watershed, and has a total of 820 sites. The status of benthic macroinvertebrate communities is evaluated using EPA's Rapid Bioassessment Protocol (RBP). Each of the five major drainage basins is sampled, on a rotational basis, every 5 years. Visual observation, stream habitat assessments and limited physical/chemical data are also collected. In 2000, a second biological monitoring network was initiated and validated for the northern portion of the state, the Fish Index of Biotic Integrity (FIBI). Using EPA's protocol, the biological health of streams is assessed using fish assemblage information. Primary strategic directions for these areas include the need for technical support in calibration of NJ's impairment scores, source identification monitoring for biologically impaired waters, and development of a fish index of biotic integrity sampling in the southern coastal plain section of the state.

In 2004, NJDEP initiated a renewed ambient lake monitoring network designed to provide the water quality data necessary to assess the ecological health of the State's lentic water resources. This program involves the testing of randomly selected lakes from the state's approximately 1100 named lakes. The water quality measurements conducted at each randomly selected lake include parameters such as dissolved oxygen, pH, nutrients, and chlorophyll a. Such testing will assist New Jersey in determining lake water quality, as needed to meet its Clean Water Act requirements and its Total Maximum Daily Load (TMDL)-related water quality assessment obligations. Currently, the lakes program focuses on the status of lake water quality in the state. The primary strategic enhancement identified would be to develop trends monitoring and assessment capability, preferably through a volunteer lakes monitoring program.

For marine waters, NJDEP conducts water quality monitoring to classify approximately 700,000 acres of marine and estuarine shellfish waters. As part of the National Shellfish Sanitation Program (NSSP), NJDEP collects approximately 15,000 ambient water samples per year from a network of more than 2,500 monitoring stations throughout the State's coastal waters. These stations are sampled between five (5) and twelve (12) times per year. The resulting data are analyzed for compliance with federal standards for shellfish sanitation. Waters not in compliance are closed to shellfish harvest. As part of the NSSP, NJDEP also conducts coastal phytoplankton monitoring every summer in New Jersey's bay and near-shore ocean waters. Key strategic directions for NSSP monitoring include enhancement of limited testing of toxics in shellfish tissue and addressing the need for capacity expansion for microbial source trackdown. This laboratory expansion is being addressed in FY2005.

NJDEP also monitors the condition of the State's coastal waters by measuring basic water quality (dissolved oxygen, nutrients and water clarity) at 260 locations on a quarterly basis. EPA provides assistance with this monitoring and with phytoplankton monitoring in the summer months, as well as support for NSSP sampling throughout the year. NJDEP and EPA Region 2 are jointly evaluating the potential use of aircraft remote sensing to significantly enhance phytoplankton monitoring. EPA's National Coastal Assessment (NCA) research program is performed in partnership with NJDEP and includes measurements of sediment chemistry, sediment toxicity and the benthic community annually at about 50 locations in New Jersey's estuarine waters. Strategic enhancements include transitioning the EPA NCA research program into a state monitoring program, development of ecological assessments for estuarine waters, and developing automated monitoring for dissolved oxygen in the state's coastal waters. The state has submitted a grant proposal to NOAA in FY2005 to develop a component of an Integrated Ocean Observing System which, if funded, would assist in addressing the need for continuous DO monitoring. NJDEP is also considering data generated by its outside partners in the NY/NJ Harbor (NJ Harbor Dischargers Group) and in the Delaware (Delaware River Basin Commission – DRBC) watershed as a possible means to address geographical gaps in the State's coastal water monitoring.

For ground water, New Jersey has developed and now maintains a cooperative network (NJDEP & USGS) consisting of 150 wells screened at the water table that are sampled 30 per year on a 5-year cycle. The goals of the network are to determine the status and trends of shallow ground-water quality as a function of land use related to non-point source pollution in New Jersey. Parameters measured include conventionals (pH, turbidity, temperature, DO), nutrients, VOCs, radioactivity, and pesticides. The primary strategic enhancement for this monitoring program would be the integration of all sources of ground water data – the network (described above) as well as data collected as a result of the Private Well Testing Act and site remediation-related data.

In addition to the water monitoring networks described above, NJDEP also conducts targeted physical, chemical and biological water monitoring for needs such as further evaluation of waters previously listed as impaired on NJ's Impaired Waterbodies List, TMDL development/implementation, and in response to environmental spills.

NJDEP has also identified key strategic directions for cross-cutting water monitoring programs, such as toxics in fish and shellfish, TMDL development, wetlands, and volunteer monitoring, as well as for water quality assessment and water quality data management. For water quality assessment and data management, these enhancements include integration of all available, high quality data (both DEP and non-department data) into the department's assessment database for use in preparation of the *Integrated Water Quality Monitoring and Assessment Report* as well as the addition of new external water monitoring data (e.g., volunteer monitoring) to STORET through development of a common data exchange element.

Details of evaluations and suggested directions for all programs are contained in the strategy document and a summary of key enhancements is contained in Appendix 3 of this document. Additional information on the water monitoring activities and networks, described in this strategy document, may also be found on NJDEP Water Monitoring and Standards website (http://www.nj.gov/dep/wmm/).

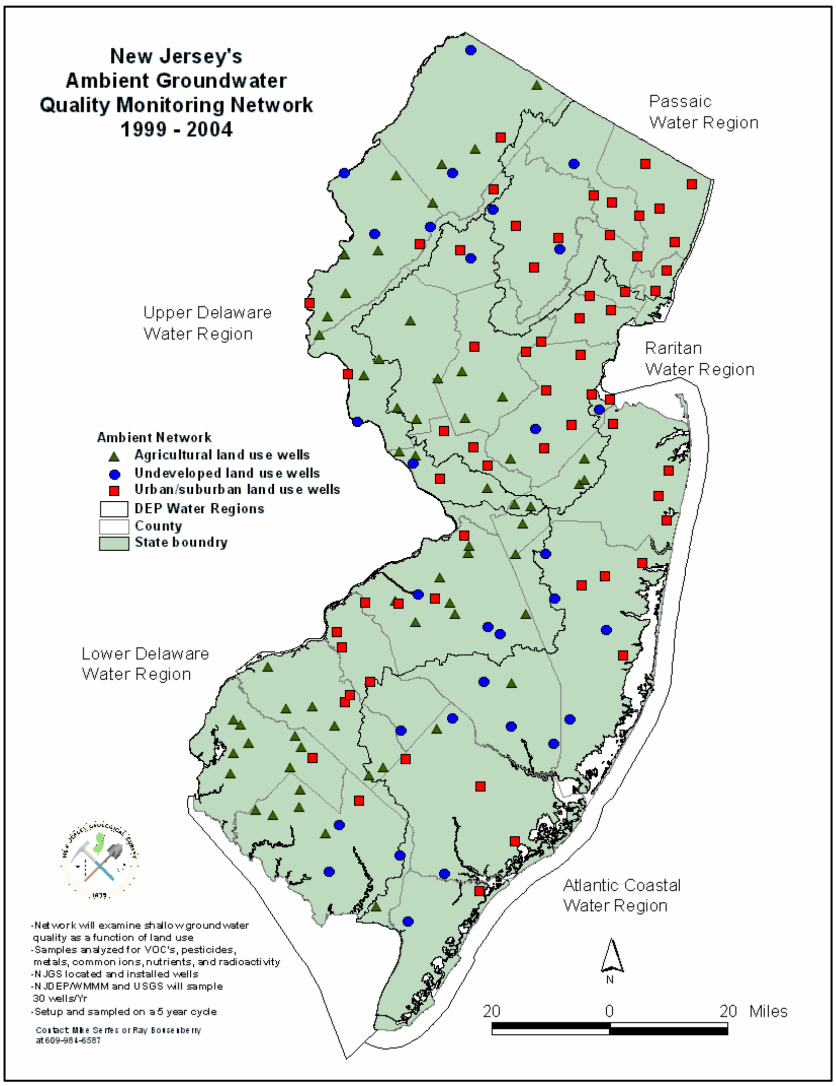
Dam below Batsto Lake, Hammonton, NJ

APPENDIX H

New Jersey's Ambient Ground Water Quality Monitoring Network

As a companion to its surface water monitoring program, New Jersey has developed and now maintains a cooperative ambient ground water quality monitoring network with the United States Geological Survey (USGS), consisting of 150 wells screened at the water table. Thirty wells are sampled annually creating a five-year monitoring cycle. The primary goal of the ambient ground water quality monitoring network (AGWQMN) is to characterize shallow ground water quality as a function of land use.

Figure 1: Location And Land Uses Associated With Ambient Network Wells



The water table is the first and most significantly impacted part of the ground water system. Network wells are screened or open just below the water table and therefore samples from them are generally expected to represent relatively young ground water. This is the ground water that interacts with and impacts surface water quality.

Wells sites were located using a stratified-random site selection process as outlined by Scott (1990). The final distribution of wells as a function of land use is 60 in agricultural areas, 60 in urban/suburban areas, and 30 in undeveloped land use areas (see Figure 1). Land use designations were determined using 1986 and 1995 land use coverage's, 1995 aerial photographs and site visits. Well sites were selected using land use designations and estimations of ground water flow directions based on the local geologic framework and site-specific topographic relationships. The 1986 and updated 1995 digital land use data categories were interpreted from 1986 and 1995 color infrared aerial photography. Parameters measured include conventional pollutants (pH, turbidity, temperature, DO), nutrients, metals, minerals, VOCs, radioactivity, and pesticides.

Geology:

The state of New Jersey can be separated in 4 geologically unique regions or Physiographic Provinces each with unique rock types, landforms and hydrogeological settings (see Figure 1).F These geological variables affect natural ground water quality. From north to south the regions are:

1) The Valley and Ridge: mostly of a thick sequence of Paleozoic sedimentary rocks ranging in age from approximately 390 to 540 million years. Sedimentary rock types include dolomite, limestone, sandstone, shale (often metamorphosed to slate) and siltstone.
2) The New England Province (Highlands): ridges of more resistant Middle Proterozoic (~ 940 to 1600 Ma) metamorphosed igneous and sedimentary rocks. These rocks are in fault and unconformable contact with lenses and elongate belts of generally less resistant Paleozoic sedimentary rocks (like 1 above) comprise the valley floors.
3) The Piedmont: intersects and it mostly underlain by the Newark Basin, which is mainly comprised of lower Mesozoic aged (~230 to 190 Ma) red, gray and black (organic rich) shale and sandstone that are inter-layered with basic igneous intrusions.
4) The Coastal Plain (Southern New Jersey): a southeasterly dipping and thickening wedge of stratified unconsolidated sand, silt, clay and gravel sediments that vary in age from Cretaceous ~ 144-66 million years ago (Ma) to Tertiary (~ 1.6 Ma).

Three glaciations have occurred within the last 2 million years. North of the maximum extent of the last glaciation (~ 20,000 years ago), the landscape is draped by unstratified and stratified unconsolidated glacial materials of various thicknesses.

Ground Water Quality:

Ground water is mainly recharged by precipitation that percolates downward through the unsaturated zone into the zone of saturation. Ground water quality is a reflection of: 1) the starting composition of precipitation; 2) the solubility and composition of the materials that the precipitation contacts on the land surface, in the unsaturated zone and in the saturated zone; and 3) the duration of that contact. Natural geologic materials impart a geochemical character to the water contacting it that is unique to those materials. Anthropogenic contaminants or pollutants in the form of dissolved gases, chemical constituents and possibly colloids and other particles can impact ground water quality.

Sources of ground water pollution can be separated into two general types: 1) point source pollution and 2) nonpoint source pollution. Point sources of pollution can be tracked back to a single identifiable source, such as a chemical spill, leaking underground storage tank or an infiltration lagoon. In the AGWQMN, efforts were made to select wells that are not impacted by pollutants from known point sources.

Nonpoint source pollution is from diffuse sources that do not have a single identifiable point of origin. This type of pollution can adversely affect the quality of water in the hydrologic cycle over large areas. For example, the release of emissions to the atmosphere from the burning of fossil fuels, such as sulfur that produces acid rain, can alter the quality of precipitation that can in turn have a regional impact on surface and ground water quality. In addition, once precipitation contacts the land surface it can be further altered by dissolving nonpoint source pollutants associated with agricultural and urban land use activities; thereby impacting water quality on a regional scale.

Data summaries of samples collected and analyzed from the 150 AGWQMN wells between 1999 and 2004 are presented and discussed below. Samples from these wells were collected by the Department of Environmental Protection's (Department's) Bureau of Fresh Water and Biological Monitoring and USGS' New Jersey Water Science Center, and analyzed at the USGS National Water Quality Laboratories in Denver, Colorado. VOCs and pesticides were analyzed using USGS methods O-3127-94 (Rose and Schroeder, 1995) and O-4127-96 (Zaugg and others, 1995), respectively. Data for water years 1999 to 2004 are reported in their respective USGS Water Resources Data Reports for New Jersey (DeLuca and others, 2000 – 2005).

AGWQMN wells in undeveloped areas yield ground water with a more natural quality than those in agricultural and urban areas and therefore provide a reference for water quality that is little affected by man's activities. Shallow ground water chemistry in undeveloped areas in the Coastal Plain (southern New Jersey) is different from that in the northern portion of NJ that is underlain by bedrock (northern New Jersey). For example, the median pH and total dissolved concentration (TDS) is much lower in southern than northern New Jersey (see Table 1). Minerals comprising the northern aquifers are generally more reactive than those in the south because they are more soluble. For example, many of the northern aquifers contain the soluble mineral calcite ($CaCO_3$) that imparts alkalinity to ground water upon dissolution. That reaction yields circum-neutral pH waters with Ca and bicarbonate as major ions. The quartz rich less-reactive sands in southern New Jersey are generally devoid of highly soluble minerals yielding little if any alkalinity and ground water is more dilute and acidic, similar to the rainwater that recharged it. Because the natural shallow ground water quality is clearly different in the Coastal Plain in southern New Jersey than in the Physiographic Provinces to the north, the data in this report are separated into Northern and Southern.

Water Quality Parameters:

The water quality parameters or constituents such as temperature, dissolved oxygen, pH, and total dissolved solid (TDS) concentration values yield information about the general character of shallow ground water as a function of geology and land use (Table 1). Lower pH and TDS values in the south reflect the difference in geologic makeup. In addition, it is generally cooler in northern New Jersey, which is reflected in the cooler shallow ground water temperatures relative to the south. The lower dissolved oxygen concentration in urban areas in both the north and south, may result from the large percentage of heat absorbing impervious surface area and resulting poorer exchange with atmospheric oxygen, and the higher temperature surface effects on the density of air. Increased total dissolved solids concentrations in agricultural and urban areas are due to the road salt and agrochemical applications. Many wells in agricultural land use areas are also near roads and therefore their water quality can also be impacted by road salt.

Table 1: Ground Water Characteristics And Constituents

Characteristic or Constituent	**Agricultural**			**Urban**			**Undeveloped**		
	Min.	**Med.**	**Max.**	**Min.**	**Med.**	**Max.**	**Min.**	**Med.**	**Max.**
Northern New Jersey									
Temp. °C	10.3	13.3	23	6.8	12.8	18.3	10	12	14
DO mg/l	<0.2	4.3	11	<0.2	2.9	6.9	<0.2	4.2	6.7
pH	6.5	7.4	8.1	5.2	6.9	8.4	5.8	7	8.1
TDS mg/l	167	269	938	208	550	2200	22	119	387
Southern New Jersey									
Temp. °C	12	16	22.5	15	18.2	29	12	14.5	18
DO mg/l	<0.2	6.4	10.5	<0.2	2.1	10	<0.2	4.6	9.3
pH	4	5.1	7.9	3.8	4.9	7.8	3.7	4.7	6
TDS mg/l	35	194	690	57	161	816	15	27	152

Trace elements

Trace elements concentrations are those that have New Jersey Ground and/or Drinking Water Quality Standards with at least one value exceeding a standard. Comparison of the frequency and concentration of detectable trace elements in undeveloped land use areas with those in agricultural and urban areas yields clues to a natural versus anthropogenic source. In northern New Jersey, Sb, As, Cd, Pb and Mn appear to be mostly natural in origin. Fe and Be have an urban association. Dissolved Fe concentrations and frequency of occurrence in urban areas may be due to the lower dissolved oxygen concentrations found there. In a more chemically reducing environment, soluble ferrous iron (Fe^{2+}) would be more stable than less soluble ferric iron (Fe^{3+}). Beryllium emissions from the burning of coal, fuel oil and municipal waste can increase the Be concentration in soil, water and air (ATSDR, 2002). In Southern New Jersey, Al, Sb, and Fe appear to by mostly natural in origin. Two urban wells sampled during the year 2000 contained 112 ug/L and 42 ug/L As. Both are associated with low dissolved oxygen concentrations of less than 0.5 mg/L, relatively high dissolved organic carbon concentrations of 4.4 and 3.5

mg/L and high Fe concentrations of 29.4 and 22.5 mg/L respectively. Therefore, the elevated As concentrations are likely related to the unusually high degree of iron-oxide dissolution although the ultimate source of the As is unknown. Be, Cd and Pb have higher occurrence and concentrations in the agricultural and urban areas. Metal cations are more mobile in acidic ground water which is common in southern New Jersey than in alkaline water that is more common in the north. The application of fertilizers and other agricultural and lawn care products can either be sources or mobilizing agents of some trace metals.

Nutrients

Nutrient concentrations are dominated by nitrate and the frequency and concentration by land use in both Northern and Southern New Jersey are: agricultural > urban > undeveloped (figure 4). . The use of nitrogen-based fertilizers in agricultural and urban areas and possibly septic system and sewer system leakage in urban areas are considered the major sources. No sample had an orthophosphorous concentration greater than 0.2 mg/L.

VOCs (29 compounds analyzed)

The total number of detections of one or more VOCs from individual well water samples from the entire network as a function of land use are: urban (87) > agricultural (34) > undeveloped (17, or 34 when normalized to 60 wells). Most of the VOCs detected are at very low concentrations. Thirty-eight out of 148 network wells sampled for VOCs had detectable levels of methyl tertiary-butyl ether (MTBE), with a maximum value of 47 ug/L. It must be noted that the well exhibiting 47 ug/L was within 1000 feet of a Bureau of Underground Storage Tank (BUST) site remediation case. The percentages of detectable levels of MTBE as a function of land use are: 47 percent of urban, 13 percent of agricultural and 6 percent of undeveloped wells. This distribution is not surprising since gasoline, in which MTBE is an additive, is used most in urban areas.

Low concentrations of chloroform and MTBE have been measured in the atmosphere and related to concentrations in shallow ground water by Baehr and others, 1999. Trichloromethane or chloroform was also frequently detected in 34 percent of undeveloped, 32 percent of urban and 12 percent of agricultural network wells. Nonpoint sources of chloroform include housing developments using individual septic systems, leaking sewers in urban areas, and the use of chlorinated drinking water for watering lawns and gardens and filling swimming pools. Southern New Jersey has a greater percent of VOC detects than northern New Jersey and a higher percentage of agricultural and undeveloped area wells with deects, however, the variety of compounds detected was greater in the north. The lower adsorptive capability of the aquifer materials in the south coupled with the greater number of urban wells in the north may explain these observations. In addition, the general west to east weather pattern would carry the most ubiquitous volatile contaminants, such as MTBE and chloroform, from the Philadelphia/Camden urban area over the less developed land use areas near the western boarder of southern New Jersey. In the north, the urban centers are mostly in the eastern part of the state.

Pesticides
The frequency of pesticide detection in the north and the south combined are agricultural (146) > urban (57) > undeveloped (three, or six when normalized to 60 wells). However, the concentration of pesticides is very low in all land use categories. Atrazine, Deethylatrazine, Metolachlor, Prometon and Simazine were the most frequently detected compounds (figure 6). They are all herbicides used to control grasses and broadleaf plants, except for Deethylatrazine which is the major metabolite of Atrazine. It must be noted the degradation by-products of these pesticides, except for Deethylatrazine, are not measured and may be at much higher concentrations than the parent compounds (personal communication; Roy Meyer, NJDEP/Pesticide Control Program).

Radionuclides
Gross alpha particle activity was analyzed within 48 hours after sample collection. This ensures that the radioactive decay of short-lived radium-224 (half-life of 3.64 days) is measured along with the other alpha emitters. The Federal and New Jersey drinking water standard of 15 pCi/L gross alpha particle activity still applies even though the shorter holding time results in increased activity if significant radium-224 is present. Generally, higher activity is found in southern versus northern New Jersey in all land use settings. This is most likely due to the greater abundance of radium-224 in southern New Jersey and the low pH of the ground water, which would increase its mobility. In both the north and the south, the highest activity is associated with agricultural and urban land use areas. The application of agricultural and lawn chemical products can compete with naturally occurring radium for adsorption sites thereby mobilizing more of it than normal into the ground water system.

Conclusion:

Total dissolved solids concentrations, as well as the concentration, frequency, and variety of trace elements, nutrients, volatile organic hydrocarbons (VOC) and pesticides are found at significantly higher levels in wells located in agricultural and urban areas than from wells in undeveloped areas. Shallow ground water in agricultural land use areas have the highest frequency of pesticide detection's, highest median nitrate concentrations (maximum up to 56 mg/L in this network) and gross alpha particle activity. These concentrations are likely related to the application of agricultural chemicals. In Urban areas, there are generally lower dissolved oxygen and higher total dissolved solids, dissolved iron, chloride, and VOC (such as MTBE) concentrations found in the ground water. These contaminants have the potential to impact potable wells and surface water.

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Appendix I:
New Jersey Surface Water Quality Standards, N.J.A.C. 7:9B

An unofficial version of the Surface Water Quality Standards rules is located on the Department's website at http://www.state.nj.us/dep/wms/bwqsa/swqsdocs.html. The official version of the rules is available from LexisNexis ®, publisher of the *New Jersey Administrative Code* (N.J.A.C.), at www.lexisnexis.com/bookstore. Additional information about obtaining Department rules is available on the Department's Web site at http://www.state.nj.us/dep/legal/get_rule.htm.

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	TMDL Name/Status	Date
02	02020007020060-01	Clove Brook (Papakating Ck)	Pathogens	Anticipated 2009 TMDL	
06	02030103010060-01	Black Brook (Great Swamp NWR)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010080-01	Dead River (above Harrisons Brook)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010100-01	Dead River (below Harrisons Brook)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010110-01	Passaic R Upr (Plainfield Rd to Dead R)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010120-01	Passaic R Upr (Snyder to Plainfield Rd)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010130-01	Passaic R Upr (40d 45m to Snyder Ave)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010150-01	Passaic R Upr (Columbia Rd to 40d 45m)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010160-01	Passaic R Upr (HanoverRR to ColumbiaRd)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010170-01	Passaic R Upr (Rockaway to Hanover RR)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103010180-01	Passaic R Upr (Pine Bk br to Rockaway)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103020040-01	Whippany R(Lk Pocahontas to Wash Val Rd)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103020050-01	Whippany R (Malapardis to Lk Pocahontas)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103020100-01	Whippany R (Rockaway R to Malapardis Bk)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103030170-01	Rockaway R (Passaic R to Boonton dam)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
06	02030103040010-01	Passaic R Upr (Pompton R to Pine Bk)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
03	02030103070050-01	Wanaque Reservior (below Monks gage)	Pathogens	Deferred (not enough data)	
03	02030103070050-01	Wanaque Reservior (below Monks gage)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
03	02030103070070-01	Wanaque R/Posts Bk (below reservior)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
03	02030103110010-01	Lincoln Park tribs (Pompton River)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
03	02030103110020-01	Pompton River	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
04	02030103120070-01	Passaic R Lwr (Fair Lawn Ave to Goffle)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Pathogens	Anticipated 2009/2010 TMDL	
04	02030103120080-01	Passaic R Lwr (Dundee Dam to F.L. Ave)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Pathogens	Deferred (Partially Tidal)	
04	02030103120090-01	Passaic R Lwr (Saddle R to Dundee Dam)	Phosphorus	Deferred (Tidal) - Await Criteria Development	
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Pathogens	Anticipated 2009/2010 TMDL	
04	02030103120100-01	Passaic R Lwr (Goffle Bk to Pompton R)	Phosphorus	TMDL Report for the Non-Tidal Passaic River Basin	Adopted 4/08
04	02030103150020-01	Second River	Pathogens	Deferred (Tidal)	
04	02030103150030-01	Passaic R Lwr (Second R to Saddle R)	Pathogens	Deferred (Tidal)	
04	02030103150050-01	Passaic R Lwr (Nwk Bay to 4th St brdg)	Pathogens	Deferred (Tidal)	
05	02030103180040-01	Overpeck Creek	Pathogens	Anticipated 2009 TMDL	
12	02030104060030-01	Matawan Creek (below Ravine Drive)	Pathogens	Deferred (not enough data)	
12	02030104060040-01	Chingarora Creek to Thorns Creek	Pathogens	Deferred (Tidal)	
12	02030104070020-01	Willow Brook	Pathogens	Deferred	
12	02030104070070-01	Swimming River Reservior / Slope Bk	Pathogens	TMDL for Fecal Coliform 31 Streams in the Atlantic Water Region; TMDL for Fecal Coliform 2 Streams in the Atlantic Water Region	Approved 9/03; Approved 9/05
12	02030104100020-01	Manasquan R (Rt 9 to 74d17m50s road)	Total suspended solids	Deferred	
12	02030104100030-01	Manasquan R (West Farms Rd to Rt 9)	pH	Deferred	
12	02030104100030-01	Manasquan R (West Farms Rd to Rt 9)	Total suspended solids	Deferred	
12	02030104100050-01	Manasquan R (gage to West Farms Rd)	pH	Deferred	
12	02030104100050-01	Manasquan R (gage to West Farms Rd)	Total suspended solids	Deferred	
12	02030104100080-01	Manasquan R (74d07m30s to Squankum gage)	pH	Deferred	
08	02030105010050-01	Raritan R SB(LongValley br to 74d44m15s)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105010050-01	Raritan R SB(LongValley br to 74d44m15s)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105010060-01	Raritan R SB(Califon br to Long Valley)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105010060-01	Raritan R SB(Califon br to Long Valley)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105010070-01	Raritan R SB(StoneMill gage to Califon)	Phosphorus	Addressed in forthcoming Raritan TMDL	

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	TMDL Name/Status	Date
08	02030105010070-01	Raritan R SB(StoneMill gage to Califon)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105010080-01	Raritan R SB(Spruce Run-StoneMill gage)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105020010-01	Spruce Run (above Glen Gardner)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105020040-01	Spruce Run Reservior / Willoughby Brook	pH	Addressed in forthcoming Raritan TMDL	
08	02030105020040-01	Spruce Run Reservior / Willoughby Brook	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105020050-01	Beaver Brook (Clinton)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105020060-01	Cakepoulin Creek	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105020080-01	Raritan R SB(Prescott Bk to River Rd)	pH	Addressed in forthcoming Raritan TMDL	
08	02030105020080-01	Raritan R SB(Prescott Bk to River Rd)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105020100-01	Raritan R SB(Three Bridges-Prescott Bk)	pH	Addressed in forthcoming Raritan TMDL	
08	02030105020100-01	Raritan R SB(Three Bridges-Prescott Bk)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105030030-01	Headquarters trib (Third Neshanic River)	Dissloved Oxygen	Addressed in forthcoming Raritan TMDL	
08	02030105030040-01	Third Neshanic River	Dissloved Oxygen	Addressed in forthcoming Raritan TMDL	
08	02030105030060-01	Neshanic River (below FNR / SNR confl)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105040010-01	Raritan R SB(Pleasant Run-Three Bridges)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105040020-01	Pleasant Run	Pathogens	Anticipated 2009 TMDL	
08	02030105040040-01	Raritan R SB(NB to Pleasant Run)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105050030-01	Lamington R (Furnace Rd to Hillside Rd)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105050040-01	Lamington R(Pottersville gage-FurnaceRd)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105050040-01	Lamington R(Pottersville gage-FurnaceRd)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105050070-01	Lamington R(HallsBrRd-Pottersville gage)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105050070-01	Lamington R(HallsBrRd-Pottersville gage)	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105050100-01	Rockaway Ck SB	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105050100-01	Rockaway Ck SB	Temperature	Addressed in forthcoming Raritan TMDL	
08	02030105050110-01	Lamington R (below Halls Bridge Rd)	pH	Addressed in forthcoming Raritan TMDL	
08	02030105050110-01	Lamington R (below Halls Bridge Rd)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105070010-01	Raritan R NB (Rt 28 to Lamington R)	Phosphorus	Addressed in forthcoming Raritan TMDL	
08	02030105070030-01	Raritan R NB (below Rt 28)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105090050-01	Stony Bk(Province Line Rd to 74d46m dam)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105090050-01	Stony Bk(Province Line Rd to 74d46m dam)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
10	02030105090060-01	Stony Bk (Rt 206 to Province Line Rd)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105090060-01	Stony Bk (Rt 206 to Province Line Rd)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
10	02030105090070-01	Stony Bk (Harrison St to Rt 206)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105090070-01	Stony Bk (Harrison St to Rt 206)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
10	02030105100010-01	Millstone River (above Rt 33)	pH	Addressed in forthcoming Raritan TMDL	
10	02030105100010-01	Millstone River (above Rt 33)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105100010-01	Millstone River (above Rt 33)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
10	02030105100020-01	Millstone R (Applegarth road to Rt 33)	pH	Addressed in forthcoming Raritan TMDL	
10	02030105100020-01	Millstone R (Applegarth road to Rt 33)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105100020-01	Millstone R (Applegarth road to Rt 33)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
10	02030105100050-01	Rocky Brook (below Monmouth Co line)	pH	Addressed in forthcoming Raritan TMDL	
10	02030105100050-01	Rocky Brook (below Monmouth Co line)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105100060-01	Millstone R (Cranbury Bk to Rocky Bk)	pH	Addressed in forthcoming Raritan TMDL	
10	02030105100060-01	Millstone R (Cranbury Bk to Rocky Bk)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105100070-01	Cranbury Brook (above NJ Turnpike)	pH	Addressed in forthcoming Raritan TMDL	
10	02030105100090-01	Cranbury Brook (below NJ Turnpike)	pH	Addressed in forthcoming Raritan TMDL	
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	Pathogens	Deferred (not enough data)	
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	pH	Addressed in forthcoming Raritan TMDL	
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	Phosphorus	Addressed in forthcoming Raritan TMDL	

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	TMDL Name/Status	Date
10	02030105110030-01	Millstone R (Beden Bk to Heathcote Bk)	Temperature	Addressed in forthcoming Raritan TMDL	
10	02030105110050-01	Beden Brook (below Province Line Rd)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105110060-01	Rock Brook (above Camp Meeting Ave)	Pathogens	TMDL for Fecal Coliform 3 Stream In Raritan Water Region	Approved 9/05
10	02030105110110-01	Millstone R (BlackwellsMills to BedenBk)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105110120-01	Sixmile Run (above Middlebush Rd)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105110140-01	Millstone R(AmwellRd to BlackwellsMills)	Phosphorus	Addressed in forthcoming Raritan TMDL	
10	02030105110170-01	Millstone River (below Amwell Rd)	pH	Addressed in forthcoming Raritan TMDL	
10	02030105110170-01	Millstone River (below Amwell Rd)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105120080-01	South Fork of Bound Brook	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105120090-01	Spring Lake Fork of Bound Brook	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105120100-01	Bound Brook (below fork at 74d 25m 15s)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105120130-01	Green Brook (below Bound Brook)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105120130-01	Green Brook (below Bound Brook)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
09	02030105120140-01	Raritan R Lwr(I-287 Piscatway-Millstone)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105120140-01	Raritan R Lwr(I-287 Piscatway-Millstone)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
09	02030105120160-01	Raritan R Lwr (MileRun to I-287 Pisctwy)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105120160-01	Raritan R Lwr (MileRun to I-287 Pisctwy)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105120170-01	Raritan R Lwr (Lawrence Bk to Mile Run)	Total suspended solids	Addressed in forthcoming Raritan TMDL	
09	02030105130040-01	Ireland Brook	Pathogens	Deferred (not enough data)	
09	02030105130040-01	Ireland Brook	pH	No TMDL - Change in SWQS to Address	
09	02030105140010-01	Manalapan Brook (above 40d 16m 15s)	pH	No TMDL - Change in SWQS to Address	
09	02030105140010-01	Manalapan Brook (above 40d 16m 15s)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105140020-01	Manalapan Bk(incl LkManlpn to 40d16m15s)	pH	No TMDL - Change in SWQS to Address	
09	02030105140020-01	Manalapan Bk(incl LkManlpn to 40d16m15s)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105140030-01	Manalapan Brook (below Lake Manalapan)	pH	No TMDL - Change in SWQS to Address	
09	02030105150010-01	Weamaconk Creek	pH	No TMDL - Change in SWQS to Address	
09	02030105150010-01	Weamaconk Creek	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105150010-01	Weamaconk Creek	Total suspended solids	Addressed in forthcoming Raritan TMDL	
09	02030105150020-01	McGellairds Brook (above Taylors Mills)	pH	No TMDL - Change in SWQS to Address	
09	02030105150020-01	McGellairds Brook (above Taylors Mills)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105150030-01	McGellairds Brook (below Taylors Mills)	pH	No TMDL - Change in SWQS to Address	
09	02030105150030-01	McGellairds Brook (below Taylors Mills)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105150050-01	Barclay Brook	pH	No TMDL - Change in SWQS to Address	
09	02030105150060-01	Matchaponix Brook (below Pine Brook)	pH	No TMDL - Change in SWQS to Address	
09	02030105150060-01	Matchaponix Brook (below Pine Brook)	Phosphorus	Addressed in forthcoming Raritan TMDL	
09	02030105160010-01	Deep Run (above Monmouth Co line)	pH	No TMDL - Change in SWQS to Address	
09	02030105160020-01	Deep Run (Rt 9 to Monmouth Co line)	pH	No TMDL - Change in SWQS to Address	
09	02030105160040-01	Deep Run (below Rt 9)	pH	No TMDL - Change in SWQS to Address	
01	02040105090020-01	Pequest R (Cemetary Road to Drag Strip)	Phosphorus	Anticipated 2009 TMDL	
01	02040105090030-01	Pequest R (Furnace Bk to Cemetary Road)	Phosphorus	Anticipated 2009 TMDL	
01	02040105090060-01	Pequest R (below Furnace Brook)	pH	Deferred	
01	02040105090060-01	Pequest R (below Furnace Brook)	Phosphorus	Anticipated 2009 TMDL	
11	02040105240030-01	Miry Run (Assunpink Cr)	Phosphorus	TMDL for Phosphorus to Address Miry Run	Approved 12/07
20	02040201040030-01	South Run (Jumping Brook to 74d35m)	Pathogens	Anticipated 2009 TMDL	
20	02040201060020-01	Doctors Creek (Allentown to 74d28m40s)	Phosphorus	TMDL to Address 4 Stream Segments in WMA 20	Approved 12/07
20	02040201060030-01	Doctors Creek (below Allentown)	Phosphorus	TMDL to Address 4 Stream Segments in WMA 20	Approved 12/07
20	02040201100020-01	Barkers Brook (above 40d02m30s)	Phosphorus	TMDL to Address 4 Stream Segments in WMA 20	Approved 12/07
19	02040202020030-01	Rancocas Ck NB (incl Mirror Lk-GauntsBk)	Pathogens	Deferred	

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	TMDL Name/Status	Date
19	02040202020030-01	Rancocas Ck NB (incl Mirror Lk-GauntsBk)	Phosphorus	Anticipated 2008 Delisting	
19	02040202020040-01	Rancocas Ck NB (NL dam to Mirror Lk)	Pathogens	Deferred	
19	02040202020040-01	Rancocas Ck NB (NL dam to Mirror Lk)	Phosphorus	Anticipated 2008 Delisting	
19	02040202030020-01	Mount Misery Bk NB (above 74d27m30s dam)	Pathogens	Deferred	
19	02040202030030-01	Mount Misery Bk MB/NB (below 74d27m30s)	Pathogens	Deferred	
19	02040202030040-01	Mount Misery Brook SB	Pathogens	Deferred	
19	02040202030090-01	Greenwood Br(below CountryLk & MM confl)	Pathogens	Deferred	
19	02040202040010-01	Rancocas Ck NB (Pemberton br to NL dam)	Phosphorus	Anticipated 2008 Delisting	
19	02040202040030-01	Rancocas Ck NB (Rt 206 to Pemberton br)	Phosphorus	Anticipated 2008 Delisting	
19	02040202040040-01	Rancocas Creek NB (Smithville to Rt 206)	Phosphorus	Anticipated 2008 Delisting	
19	02040202040050-01	Rancocas Creek NB (below Smithville)	Phosphorus	Anticipated 2008 Delisting	
19	02040202050050-01	Friendship Ck (below/incl Burrs Mill Bk)	Phosphorus	Anticipated 2008 Delisting	
19	02040202050070-01	Jade Run	Phosphorus	Anticipated 2008 Delisting	
19	02040202050080-01	Rancocas Ck SB (Vincentown-FriendshipCk)	Phosphorus	Anticipated 2008 Delisting	
19	02040202050090-01	Rancocas Ck SB (BobbysRun to Vincentown)	Pathogens	Deferred - (not enough data)	
19	02040202050090-01	Rancocas Ck SB (BobbysRun to Vincentown)	Phosphorus	Anticipated 2008 Delisting*	
19	02040202060070-01	Little Creek (above Bear Swamp River)	Pathogens	Deferred	
19	02040202060080-01	Rancocas Ck SW Branch (above Medford br)	Pathogens	Deferred	
19	02040202060080-01	Rancocas Ck SW Branch (above Medford br)	Phosphorus	Anticipated 2008 Delisting*	
19	02040202060100-01	Rancocas Ck SW Branch (below Medford br)	Phosphorus	Anticipated 2008 Delisting*	
19	02040202070020-01	Rancocas Creek SB (Rt 38 to Bobbys Run)	Pathogens	Deferred	
19	02040202070020-01	Rancocas Creek SB (Rt 38 to Bobbys Run)	Phosphorus	Anticipated 2008 Delisting*	
19	02040202070030-01	Rancocas Creek SB (below Rt 38)	Pathogens	Deferred	
19	02040202070030-01	Rancocas Creek SB (below Rt 38)	Phosphorus	Anticipated 2008 Delisting*	
19	02040202080010-01	Parkers Creek (above Marne Highway)	Phosphorus	Anticipated 2008 Delisting*	
19	02040202080020-01	Rancocas Creek (Martins Beach to NB/SB)	Phosphorus	Anticipated 2008 Delisting*	
19	02040202080030-01	Mill Creek (Willingboro)	Phosphorus	Anticipated 2008 Delisting*	
18	02040202100020-01	Pennsauken Ck NB (incl StrwbrdgLk-NJTPK)	Phosphorus	Addressed in Strawbridge Lake TMDL	Adopted 6/03
18	02040202100030-01	Pennsauken Ck NB (below Strawbridge Lk)	Phosphorus	Addressed up to dam by Strawbridge Lake TMDL	Adopted 6/03
18	02040202100040-01	Pennsauken Ck SB (above Rt 41)	Phosphorus	Anticipated 2008 Delisting*	
18	02040202100050-01	Pennsauken Ck SB (below Rt 41)	Phosphorus	Anticipated 2008 Delisting for non-tidal portion*	
18	02040202100060-01	Pennsauken Ck (below NB / SB)	Phosphorus	Deferred (Tidal) - Await Criteria Development	
17	02040206170040-01	Buckshutem Creek (above Rt 555)	Pathogens	Deferred	
17	02040206170050-01	Buckshutem Creek (below Rt 555)	Pathogens	Deferred	
16	02040206230060-01	Cox Hall Creek / Mickels Run (to Villas)	Pathogens	Deferred (not enough data)	
17	Eastern Gate Lake-17	Eastern Gate Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
03	Erskine Lake-03	Erskine Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
03	Forest Hill Lake-03	Forest Hill Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
01	Forest Lake-01	Forest Lake	Pathogens	TMDL for Pathogens to Address 11 Lakes Northwest WR	Approved 9/07
01	Fox Hollow Lake-01	Fox Hollow Lake	Pathogens	TMDL for Pathogens to Address 11 Lakes Northwest WR	Approved 9/07
06	Foxs Pond-06	Foxs Pond	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
17	Franklinville Lake-17	Franklinville Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
01	Furnace Lake-01	Furnace Lake	Pathogens	TMDL for Pathogens to Address 11 Lakes Northwest WR	Approved 9/07
14	Hammonton Lake-14	Hammonton Lake	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
13	Holiday Lake-13	Holiday Lake	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
17	Holly Green Campground Pond-17	Holly Green Campground Pond	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
12	Hooks Creek Lake-12	Hooks Creek Lake	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
06	Indian Lake-06	Indian Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
06	Intervale Lake-06	Intervale Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07

WMA	Assessment Unit ID	Assessment Unit Name	Parameter	TMDL Name/Status	Date
17	Iona Lake-17	Iona Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
03	Kitchell Lake-03	Kitchell Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
01	Lackawanna Lake-01	Lackawanna Lake	Pathogens	TMDL for Pathogens to Address 11 Lakes Northwest WR	Approved 9/07
13	Lake Barnegat-13	Lake Barnegat	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
19	Lake Coxtoxen	Lake Coxtoxen	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
03	Lake Edenwold-03	Lake Edenwold	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
01	Lake Hopatcong-01	Lake Hopatcong	Pathogens	TMDL for Pathogens to Address 11 Lakes Northwest WR	Approved 9/07
03	Lake Ioscoe-03	Lake Ioscoe	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
19	Lake James-19	Lake James	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
16	Lake Laurie-16	Lake Laurie	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
02	Lake Mohawk-02	Lake Mohawk	Pathogens	TMDL for Pathogens to Address 11 Lakes Northwest WR	Approved 9/07
18	Lake Silvestro	Lake Silvestro	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
06	Lake Swannanoa-06	Lake Swannanoa	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
12	Lake Takanassee-12	Lake Takanassee	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
01	Lake Winona-01	Lake Winona	Pathogens	TMDL for Pathogens to Address 11 Lakes Northwest WR	Approved 9/07
03	Lionhead Lake-03	Lionhead Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
16	Ludlams Pond-16	Ludlams Pond	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
17	Malaga Lake-17	Malaga Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
13	Manahawkin Lake-13	Manahawkin Lake	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
19	Mirror Lake-19	Mirror Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
06	Mountain Lake-06	Mountain Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
13	Ocean County Park Lake-13	Ocean County Park Lake	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
13	Ocean Twp Bathing Beach-13	Ocean Twp Bathing Beach	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
06	Parsippany Lake-06	Parsippany Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
17	Parvin Lake-17	Parvin Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
13	Pine Lake-13	Pine Lake	Pathogens	TMDL for Pathogens to Address 18 Lakes in Atlantic WR	Approved 9/07
06	Pond at Conference Center (Left &	Pond at Conference Center (Left & Rt.)**	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
06	Powder Mill Pond-06	Powder Mill Pond	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
06	Rainbow Lakes-06	Rainbow Lakes	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
08	Randolph Park Lake-08	Randolph Park Lake	Pathogens	TMDL for Pathogens to Address 4 Lakes Raritan WR	Approved 9/07
08	Ravine Lake-08	Ravine Lake	Pathogens	TMDL for Pathogens to Address 4 Lakes Raritan WR	Approved 9/07
03	Skyline Lakes-03	Skyline Lakes	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
02	Sleep Valley Lake	Sleep Valley Lake	Pathogens	TMDL for Pathogens to Address 11 Lakes Northwest WR	Approved 9/07
19	Sturbridge Lake-19	Sturbridge Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
06	Sunrise Lake-06	Sunrise Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
08	Sunset Lake-08	Sunset Lake	Pathogens	TMDL for Pathogens to Address 4 Lakes Raritan WR	Approved 9/07
17	Sunset Lake-17	Sunset Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
06	Telemark Lake-06	Telemark Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
19	Timber Lake-19	Timber Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
04	Toms Lake-04	Toms Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
20	Upper Sylvan Lake-20	Upper Sylvan Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07
06	West Lake-06	West Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
06	White Meadow Lake-06	White Meadow Lake	Pathogens	TMDL for Pathogens to Address 25 Lakes Northeast WR	Approved 9/07
17	Wilson Lake-17	Wilson Lake	Pathogens	TMDL for Pathogens to Address 17 Lakes Lower Del WR	Approved 9/07

* *Also Known as Cold Springs Pond

*Analysis for delisting under review

Appendix K

Water Quality Projects Funded with Section 319(h) Grants SFY2004-2006

FY	WMA	RECIPIENT	PROJECT DESCRIPTION	GRANT AMOUNT
2004	3	West Milford Township	Lake Restoration Plan for Greenwood Lake Passaic County, New Jersey	$152,330
2004	12	The Deal Lake Commission c/o Borough of Allenhurst	Regional Stormwater Management Plan for the Deal Lake Watershed For the Purpose of the Managing Existing and future Stormwater Impact	$99,400
2004	12	Atlantic Highlands Environmental Commission	Many Mind Creek Regional Stormwater Management Plan	$87,833
2004	8,10	East Amwell Township	A Proposal to Prepare a Regional Stormwater Management Plan for the Sourland Mountain Watershed	$92,470
2004	10	Middlesex Planning Department	A Regional Stormwater Management Plan for the Devils, Shallow, Cedar, and Cranbury Brooks Watershed	$286,200
2004	3	West Milford Township	Posts Brook Regional Stormwater Management Plan	$144,872
2004	18	Rutgers, The State University of New Jersey	Regional Stormwater Management Plan for Pompeston Creek, Burlington County, New Jersey	$249,570
2004	8	Readington Township	A Regional Stormwater Management Plan For the Pleasant Run and Watershed	$52,560
2004	18	Camden County Soil Conservation District	Development of a Regional Stormwater Management Plan for the Upper Mantua Creek	$503,065
2005	17	Cumberland/Salem County Soil Conservation District	Watershed Restoration Plan for the Upper Salem River Watershed	$313,400
2005	1	Lake Hopatcong Commission	Implementation of Nonpoint Source Management Measures to Reduce the Phosphorus and Sediment Loads Entering Lake Hopatcong	$844,500
2005	8	Mount Olive Township	Budd Lake Watershed Restoration, Protection, and Regional Stormwater Management Plan	$393,994
2005	6	Rockaway River Watershed Cabinet	Hurd Park Goose Management and Shoreline Restoration Project	$201,000
2005	17	Rutgers, The State University	Watershed Restoration Plan for the Upper Cohansey River Watershed	$310,640
2005	2	Vernon Township Department of Health and Human Services	Black Creek Watershed Restoration, Protection, and Regional Stormwater Management Plan	$385,674
2005	2	Wallkill River Watershed Management Group	Watershed Restoration Plan for the Papakating Creek and the Surrounding Watershed	$168,850
2005	2	Wallkill River Watershed Management Group	Watershed Restoration Plan for Clove Acres Lake and the Surrounding Lakeshed	$138,050
2005	11	West Amwell Environmental Commission	Watershed Protection Plan for the Alexauken Creek Watershed	$239,300
2005	4	William Patterson University	Preakness Brook Restoration, Protection, and Regional Stormwater Management Plan	$408,586
2005	11	New Jersey Water Supply Authority	Watershed Restoration and Protection Plan for the Lockatong and Wickecheoke Creek Watersheds, Hunterdon County, New Jersey	$237,290

2006 Assessment Unit	2008 Assessment Unit
A.Clemente Inc. Pond-17	02040206030070-01
Absegami Lake-14	02040301200050-02
Albert Giampietro-17	02040206180020-01
Alcyon Lake-18	02040202130030-01
Allentown Lake-20	02040206180020-01
Ames Lake-06	02030103030100-01
Amwell Lake-10	02030105090010-01
Anchor Lake One-14	02040301160100-01
Arapaho Lake-02	02020007010010-01
Arrowhead Lake-06	02030103030120-01
Assunpink Lake-11	02040105230020-01
Atco Lake-14	02040301160050-01
Atlantic City Reservoir 1-15	02040302020030-01
Atlantic City Reservoir 2-15	02040302020030-01
Atsion Lake-14	02040301160030-01
Bamber Lake-13	02040301090030-01
Barbours Pond-04	02030103120030-01
Bargaintown Pond-15	02040302060030-01
Barry Lakes-02	02020007040050-01
Bass Lake-01	02040105050020-01
Batso Lake-14	02040301150080-01
Bayberry Cove-16	02040302080010-01
Beachcomer Lake-16	02040206230050-01
Bear Swamp Lake 2-03	02030103050080-01
Bearfort Waters-02	02020007040060-01
Beaver Lake-02	02020007010030-01
Beaverdam Lake-14	02040301160060-01
Beiser's Pond	02020007010010-01
Belhaven Lake-14	02040301170050-01
Bell Lake-01	02040104140030-01
Bell Lake-18	02040202120110-01
Bellmawr Lake-18	02040202120080-01
Bells Lake-18	02040202120030-01
Bennetts Pond-13	02040301030030-01
Bethel Lake-18	02040202130020-01
Big Pine Lake-19	02040202020020-01
Big Timber Lake-16	02040206220020-01
Birchwood Lake-06	02030103020080-01
Birchwood Lake-19	02040202060030-01
Black Run Bogs-19	02040202060050-01
Blackwood Lake-18	02040202120040-01
Blue Lake-19	02040202060020-01
Boonton Reservoir-06	02030103030150-01
Bostwick Lake-17	02040206080010-01
Bowlby Pond-06	02030103030070-01
Braddock Lake-15	02040302040070-01
Braddocks Millpond-19	02040202060010-01
Brainard Lake-10	02030105100090-01
Branchbrook Park Lake-04	02030103150040-01
Bubbling Springs-03	02030103070010-01
Budd Lake-08	02030105010030-01
Buena Vista CG-15	02040302040120-01
Burnt Mill Pond-17	02040206140020-01
Butler Pond-06	02030103010140-01
Butterfly Pond-13	02040301060050-01
Camp Gigal Pond-03	02030103070010-01

2006 Assessment Unit	2008 Assessment Unit
Camp Lewis-06	02030103030110-01
Camp Merrywood-17	02040206140030-01
Camp Roosevelt Lake-17	02040206060010-01
Camp Taylor Lake-01	02040105060010-01
Campbells Pond-07	02030104050010-01
Canistear Reservoir-03	02030103050020-01
Carasaljo Lake-13	02040301030040-01
Cardinal Ridge-19	02040202060030-01
Carnegie Lake-10	02030105110020-01
Cedar Lake 1-15	02040302040050-01
Cedar Lake 2-15	02040302040050-01
Cedar Lake-06	02030103030140-01
Cedar Lake-17	02040206100040-01
Cedar Run Lake-19	02040202050050-01
Cedarville Block Sand & Gravel Company Pond-	02040206100050-01
Centennial Lake-19	02040202060020-01
Chesler Lake-08	02030105050010-01
Chips Folly-14	02040301200020-01
Clarks Pond-17	02040206090050-01
Clementon Lake-18	02040202120010-01
Cliffwood Lake-03	02030103050040-01
Clint Millpond-16	02040206220020-01
Clinton Reservoir-03	02030103050040-01
Clinton Wildlife Management Area Pond-08	02030105020040-01
Clinton WMA Pond-08	02030105020040-01
Clove Acres Lake-02	02040104090030-01
Clove Lake-01	02040104090030-01
Cold Spring Lake-03	02030103050080-01
Colonial Lake-11	02040105240010-01
Columbia Lake-01	02040105050050-01
Como Lake-12	02030104090080-01
Cooks Pond-06	02030103030140-01
Cooper River Lake-18	02040202110050-01
Country Lake-19	02040202030060-01
Cozy Lake-06	02030103030030-01
Cranberry Lake-01	02040105150060-01
Crandon Lakes-01	02040105030010-01
Cranes Lake-15	02040302040020-01
Crater Lake-01	02040105030030-01
Crystal Lake-03	02030103100060-01
Crystal Lake-20	02040201090030-01
Crystal Springs-02	02020007010050-01
Culvers Lake-01	02040105040010-01
Cumberland Pond-17	02040206190020-01
Cupsaw Lake-03	02030103070050-01
Cushman Lake-15	02040302040070-01
Davidsons Mill Pond-09	02030105130050-01
Davis Mill pond-17	02040206070070-01
Deal Lake-12	02030104090030-01
Deer Head Lake-13	02040301110020-01
Deer Lake-01	02040104140040-01
Deer Park Pond-01	02040105150080-01
Deer Pond-06	02030103030130-01
Deer Trail Lake-02	02020007010030-01
Delanco Camp Lake-19	02040202050040-01
Delaware Lake-01	02040105060020-01

2006 Assessment Unit	2008 Assessment Unit
Demott Pond	02030105020040-01
Delaware and Raritan Canal-09	02030105120140-01
Dennisville Lake-16	02040206220030-01
Devoe Lake-09	02030105140030-01
DOD Lake-17	02040301090050-01
Double Trouble State Park-13	02040301090050-01
Driftwood Camping Resorts Lake-16	02030103120080-01
Duck Pond-08	02030105050010-01
Dundee Lake-04	02030103120090-01
Durham Pond-06	02030103030110-01
East Brunswick Community Lake-09	02030105130040-01
East Creek Lake-16	02040206210060-01
East Highland Lake-02	02020007040040-01
Eastern Gate Lake-17	02040206120020-01
Echo Lake-03	02030104050060-01
Echo Lake-07	02030103050050-01
Egg Harbor City Lake-14	02040301170090-01
Elm (James) Lake-14	02040301160120-01
Elmer Lake-17	02040206150010-01
Erskine Lake-03	02030103070050-01
Estling Lake-06	02030103030120-01
Etra Lake-10	02030105100050-01
Evans Pond-18	02040202110040-01
Fairview Lake-01	02040105050020-01
Farm Crest Acres-03	02030103050050-01
Farrington Lake-09	02030105130060-01
Fawn Lake-02	02020007010030-01
Fawn Lake-13	02040301130020-01
Flamingo Lake-19	02040202060010-01
Forest Hill Lake-03	02030103050080-01
Forest Lake-01	02040105070020-01
Four ("4") Seasons Campground Pond-17	02040206030010-01
Fox Hollow Lake-01	02040105040050-01
Foxmill Lake-17	02040206030010-01
Foxs Pond-06	02030103030090-01
Franklin Lake-03	02030103100060-01
Franklin Lake-12	02030104080030-01
Franklinville Lake-17	02040206120020-01
Frenches Pond-01	02040105150080-01
Furnace Lake-01	02040105090050-01
Gandy's Beach	02040204910030-01
Garden Park Lake-16	02040302080060-01
Garden State Academy Pond-01	02040105070050-01
Gardners Pond-01	02040105070020-01
Garrison Lake-17	02040206120040-01
Gerard Lake-02	02020007010030-01
Ghost Lake-01	02040105090010-01
Gilman Lake-18	02040202150010-01
Glen Lake	02020007010010-01
Glen Wild Lake-03	02030103070070-01
Glenwood Lake-02	02020007040030-01
Gordon Lakes-03	02030103070070-01
Goshen Pond-14	02040301160030-01
Great Gorge-02	02020007040010-01
Green Pond-06	02030103030050-01
Green Turtle Lake-03	02030103070030-01

2006 Assessment Unit	2008 Assessment Unit
Green Valley Beach Campground	02030103070010-01
Greenbrook Lake-03	02030103070020-01
Greenwich Lake-18	02040202140020-01
Greenwood Lake-03	02030103070030-01
Grenlock Lake-18	02040202120030-01
Grove Mill Pond-10	02030105100130-01
Haddon Lake-18	02040202120090-01
Hainsville Pond-01	02040104130010-01
Hammonton Lake-14	02040301170010-01
Hands Millpond-16	02040206210030-01
Hankins Pond-17	02040206170010-01
Hanover Lake-19	02040202020030-01
Hanover Pond-19	02040202020010-01
Harmony Lake-19	02040202060020-01
Harmony Ridge Large Lake-01	02040105040020-01
Harmony Ridge Small Lake-01	02030105100130-01
Harrison Mountain Lake-03	02030103070040-01
Harrisonville Lake-18	02040202160020-01
Harrisville Lake-14	02040301180070-01
Harry Wrights Lake-13	02040301080030-01
Heaters Pond-02	02020007010020-01
Henion Pond-03	02030103050080-01
Hercules Pond-01	02040105120020-01
Heritage Lakes-02	02020007010050-01
Hidden Acres Lake-16	02040206220020-01
Hidden Valley Lake-02	02020007040020-01
Hidden Valley Lake-03	02030103070060-01
High Crest Lake-03	02030103050080-01
Highland Lake 1-02	02020007040040-01
Highland Lake-02	02020007040040-01
Hobb Lake-14	02040301160080-01
Holiday Lake-01	02040104090030-01
Holiday Lake-13	02040301130010-01
Holly Green Campground Pond-17	02040206120040-01
Holly Lake-19	02040202060030-01
Hooks Creek Lake-12	02030104060010-01
Horicon Lake-13	02040301070090-01
Horseshoe Lake-08	02030105050020-01
Hubers Lake-03	02030103100060-01
Hudson Lake-17	02040206030060-01
Hurff Lake-12	02030104100040-01
Iliff Lake-01	02040105070020-01
Imlaystown Lake-20	02040201060020-01
Indian Lake-06	02030103030120-01
Indian Lake-15	02040302040080-01
Indian Mills Lake-14	02040301150030-01
Intervale Lake-06	02030103020080-01
Iona Lake-17	02040206120050-01
Irisado Lake-13	02040301050010-01
Japanese Garden A-09	02030105080020-01
JCC Camp Lake-19	02040202060030-01
Jeddys Pond-17	02040206090030-01
Jefferson Lake-01	02040105150060-01
Jennings Lake-19	02040202060040-01
Kampfe Lake-03	02030103050080-01
Kandle Lake-18	02040202130010-01

2006 Assessment Unit	2008 Assessment Unit
Kennedy Lake-13	02040301070010-01
Keswick Lake-13	02040301080020-01
Kettle Run-19	02040202060010-01
Kilroy Park Lake-03	02030103110020-01
Kings Grant Lake-19	02040202060050-01
Kirkwood Lake-18	02040202110030-01
Kitchell Lake-03	02030103070040-01
Kittatinny Lake-01	02040104140040-01
Kittatiny Camp Lake-01	02040104110020-01
Lackawanna Lake-01	02040105150050-01
Ladys Lake-14	02040301160020-01
Lake 1417-19	02040202050060-01
Lake 31A-09	02030105080020-01
Lake Aeroflex-01	02040105070020-01
Lake Ashroe-01	02040104140040-01
Lake at the Woods-19	02040202020020-01
Lake Barnegat-13	02040301110020-01
Lake Conway-02	02020007040020-01
Lake Coxtoxen-19	02040202060100-01
Lake Edenwold-03	02030103050070-01
Lake Hopatcong-01	02040105150020-01
Lake Inawendiwin-19	02040202050040-01
Lake Ioscoe-03	02030103070070-01
Lake James-19	02040202060050-01
Lake Kemah-01	02040105040030-01
Lake Laurie-16	02040302080080-01
Lake Lenape-01	02040302040130-01
Lake Manahawkin-13	02040301130030-01
Lake Manetta-13	02040301030040-01
Lake Matawan-12	02030104060030-01
Lake Mishe-Mokwa-19	02040202060030-01
Lake Mohawk-02	02020007010010-01
Lake Mo-Li-Th-Ma-14	02040301160080-01
Lake Musconetcong-01	02040105150030-01
Lake Nummy-16	02040206210050-01
Lake Reality-06	02030103030130-01
Lake Robert Rooke-01	02040104140040-01
Lake Shawanni-01	02040104150010-01
Lake Shennadoah-13	02040301030050-01
Lake Silvestro-18	02040202110030-01
Lake Stockholm-03	02030103050030-01
Lake Stockwell-19	02040202060030-01
Lake Swannanoa-06	02030103030020-01
Lake Takanassee-12	02030104090010-01
Lake Tappan-05	02030103170030-01
Lake Tranquility-01	02040105070050-01
Lake Wapalanne-01	02040104140030-01
Lake Winona-01	02040104140030-01
Lake1417-19	02040202030060-01
Lake1523-19	02040202060050-01
Lake1552-19	02040202050010-01
Lake1606-14	02040301150010-01
Lake1609-14	02040301150010-01
Lake1616-14	02040301150010-01
Lake1634-14	02040301180020-01
Lake1670-14	02040301160010-01

2006 Assessment Unit	2008 Assessment Unit
Lake1685-14	02040301150030-01
Lake1717-14	02040301150020-01
Lake1729-14	02040301180020-01
Lake1741-14	02040301150040-01
Lake1757-14	02040301150040-01
Lake1768-14	02040301180040-01
Lake1770-14	02040301180030-01
Lake1930-14	02040301160080-01
Lake1950-14	02040301160100-01
Lake1970-14	02040301160120-01
Laurel Lake 1-17	02040206170050-01
Laurel Lake 2-17	02040206170050-01
Lawrenceville School Camp Pond-01	02040105160040-01
Layfayette Municipal Pond-01	02040105040060-01
Lazy River Lake-15	02040302070020-01
Ledells Pond-06	02030103010010-01
Lefferts Lake-12	02030104060020-01
Lenape Lake-15	02040302040130-01
Liberty Lake-01	02040105090040-01
Liberty Lake-20	02040105090040-01
Lily Lake-15	02040302010010-01
Lincoln Park Lake-05	02030103180100-01
Linden Lake-18	02040202110030-01
Lindy Lake-03	02030103070040-01
Lingerts Pond-08	02030105020040-01
Lionhead Lake-03	02040202060040-01
Long Lake-19	02040202030050-01
Long Pine Pond-01	02030103100070-01
Lookover Lake-02	02020007040060-01
Lower Aetna Lake-19	02040202060030-01
Lower Lake-13	02040301110020-01
Lower Sylvan Lake-20	02040201110010-01
Ludlams Pond-16	02040206220030-01
Mac's Pond-17	02030104100100-01
Magnolia Lake-16	02040302080030-01
Makepeace Lake-15	02040302040110-01
Malaga Lake-17	02040206130040-01
Manahawkin Lake-13	02040301130030-01
Manalapan Lake-09	02030105140020-01
Manasquan Reservoir-12	02030104100050-01
Maple Lake-15	02030103050080-01
Marcia Lake-01	02040104090020-01
Marine Lake-08	02030105050010-01
Marlton Lake-18	02040202130040-01
Marlu Lake-01	02040104090020-01
Mary Elmer Lake-17	02040206090010-01
Mashipacong Pond-01	02040104140020-01
Maskells Mill Pond-17	02040206070030-01
Matthews Lake-03	02030103070070-01
McDonalds Ponds-03	02030103110020-01
Mecca Lake-01	02040105030010-01
Memorial Lake-17	02040206030010-01
Menantico Lake-17	02040206180030-01
Menantico Sand Ponds-17	02040206180050-01
Mendham Twp Pond-06	02030103020010-01
Mercer Co. Park Lake-11	02040105230050-01

2006 Assessment Unit	2008 Assessment Unit
Merrill Creek Reservoir-01	02040105140040-01
Mill Pond-14	02040301200120-02
Millhurst Pond-09	02030105140010-01
Mimosa Lakes-19	02040202060020-01
Mine Hill Lake-08	02030105050010-01
Mine Hill Reservoir2-01	02040105150090-01
Mirror Lake-19	02040202020030-01
Mohegan Lake-19	02040202060020-01
Monksville Reservoir-03	02030103070030-01
Morris Lake-02	02020007010010-01
Morse Lake-03	02030103070070-01
Moss Mill Lake-14	02040301200100-02
Mount Hope Pond-06	02030103030110-01
Mount Laurel Lake-02	02020007040060-01
Mount Misery Lake-19	02040202030090-01
Mountain Lake-01	02040105090040-01
Mountain Lake-06	02030103020080-01
Mountain Springs Lake-03	02030103050080-01
Mt. Glen Lakes-03	02030103070040-01
Mt. Misery Lake-19	02040202030090-01
Muckshaw Ponds-01	02040105070030-01
Narraticon Lake-18	02040202150050-01
Neepaulin Lake-02	02020007020070-01
New Brooklyn Lake-15	02040302030020-01
New Market Pond-09	02030105120100-01
Newark Bay	02030104010020-02
Newton Lake-18	02040202030090-01
Nomahegan Park Lake-07	02030104050060-01
North Community	02040201030010-01
North Hudson Park Lake-05	02030101170010-01
NYODA Camp-06	02030103030030-01
Oak Ridge Reservoir-03	02030103050030-01
Oakford Lake-20	02040201040070-01
Oakwood Lake-19	02030103050080-01
Ocean County Park Lake-13	02040301020050-01
Ocean Twp Bathing Beach-13	02040301120010-01
Old Cedar Lake-17	02040206120040-01
Old Forge Lake-19	02040202050050-01
Oldham Pond-04	02030103120040-01
Oldmans Creek Lake-18	02040202160010-01
Openaka Lake-06	02030103030120-01
Oradell Reservoir-05	02030103170060-01
Osborne Pond-12	02030104090070-01
Oswego Lake-14	02040301180060-01
Otter Pond-14	02040301190060-01
Outdoor World Lake-16	02040302070080-01
Outdoor World Sea Pines Lake-16	02040302070080-01
Overpeck Creek-05	02030103180040-01
Packanack Lake-03	02030103110020-01
Pakim Pond-19	02040202030080-01
Panorama Lake-02	02020007030030-01
Panther Lake-01	02040105070020-01
Paradise Lake-14	02040301160110-01
Parsippany Lake-06	02030103020080-01
Parvin Lake-17	02040206150050-01
Paulins Kill Lake-01	02040105040080-01

2006 Assessment Unit	2008 Assessment Unit
Peddie Lake-10	02030105100050-01
Peddie Lake-14	02040301200100-02
Pemberton Lake-19	02040202040010-01
Penbryn Lake-15	02040302030010-01
Pia Costa Lake-03	02030103110020-01
Pickerel Lake-13	02040301070050-01
Pilgrim Lake-14	02040301200040-02
Pine Haven Lake-16	02040302080030-01
Pine Hill Scout Camp Lake-18	02040202120010-01
Pine Lake-13	02040301070090-01
Pine Lake-19	02040202060020-01
Pinecliff Lake-03	02030103070020-01
Pines Lake-03	02030103100070-01
Pleasant Valley Lake-02	02020007040010-01
Plymouth Lake-01	02040105030030-01
Pohatcong Lake-13	02040301140030-01
Pompton Lake-03	02030103100070-01
Pond at Conference Center (Left & Rt.)	02040301070040-01
Post Brook Farms Lake-03	02030103070040-01
Powder Mill Pond-06	02030103020030-01
Presidential Lakes-19	02040202030080-01
Prospertown Lake-20	02040201050010-01
Pumping Station Pond-16	02040206230050-01
Rahway River Park Lake-07	02030104050060-01
Rainbow Lake-17	02040206150060-01
Rainbow Lakes-06	02030103020080-01
Ramapo Lake-03	02030103100070-01
Randolph Park Lake-08	02030105050010-01
Ravine Lake-08	02030105060040-01
Red Wing Lakes-14	02040301200080-02
Resort Campground Lake-15	02040302070080-01
Ricabear Lake-06	02030103030130-01
Rickonda Lake-03	02030103070030-01
Rising Sun-11	02040105230010-01
Rock Lodge Pond-03	02030103050030-01
Rock Ridge Lake-06	02030103030140-01
Rogerene Lake-08	02030105010010-01
Rosedale Lake-10	02030105090050-01
Round Valley Reservoir Recreation Area-08	02030105020090-01
Round Valley Reservoir-08	02030105020090-01
Ryker Lake-06	02030103030010-01
Saffin Pond-01	02040105150010-01
Saginaw Lake-02	02020007010010-01
Saipe Lake-19	02040202060030-01
Sand Pond-01	02040105050030-01
Sawmill Pond-01	02040104140010-01
Saxton Lake-01	02040105150080-01
Scarlet Oak Pond-03	02030103100010-01
Scenic Lake-02	02020007010070-01
Seashore Campsites Lake-16	02040302080080-01
Seneca Lake-01	02040105150040-01
Shadow Lake-12	02030104070090-01
Shadow Lake-14	02040301150030-01
Shanock Lake-13	02040301070010-01
Shawnee Country Lake-19	02040202060070-01
Shawnee Lake-01	02040105150020-01

2006 Assessment Unit	2008 Assessment Unit
Shaws Mill Pond-17	02040206100060-01
Shepherds Lake-03	02030103070050-01
Sheppard Pond-03	02030103070050-01
Sheppards Mill Pond-17	02040206090080-01
Sherwood Forest Pond-19	02040202060030-01
Shongum Lake-08	02030105050010-01
Silver Lake 1-18	02040202120010-01
Silver Lake 2-18	02040202110030-01
Silver Lake-01	02040105100030-01
Silver Lake-02	02020007010030-01
Silver Lake-12	02030104090080-01
Skyline Lakes-03	02030103070060-01
Sleep Valley Lake-02	02020007030010-01
Sleepy Hollow CG Lake-15	02040302050110-01
Smithville Lake-19	02040202040050-01
Sparta Lake-06	02030103030010-01
Speedwell Lake-06	02030103020040-01
Spooky Brook Pond-10	02030105110170-01
Spring Lake-12	02030104090080-01
Spring Lake-20	02040201070030-01
Spruce Run Reservoir-08	02030105020040-01
Squaw Lake-19	02040202060030-01
Stafford Forge Lake-13	02040301130050-01
Star Lake-03	02030103050080-01
Steeny Kill Lake-01	02040104090020-01
Stewart Lake-18	02040202120100-01
Stickle Pond-03	02030103050070-01
Stockton State-14	02040301200100-02
Stone Tavern-11	02040105230010-01
Stoneybrook Swim Club Lake-03	02030103050070-01
Stony Lake-01	02040104140040-01
Strawbridge Lake-18	02040202100020-01
Sturbridge Lake-19	02040202060040-01
Success Lake-13	02040301070010-01
Summit Lake-02	02020007010030-01
Sun Air Campground-06	02030103030030-01
Sunrise Lake-06	02030105070010-01
Sunset Lake-08	02030105070010-01
Sunset Lake-17	02040206090030-01
Surprise Lake-03	02030103070020-01
Swan Lake-19	02040202060010-01
Swartswood Lake-01	02040105030020-01
Tamarack Lake-19	02040202060030-01
Tamaracks Lake-02	02020007010030-01
Taunton Lake-19	02040202060020-01
Telemark Lake-06	02030103030100-01
Thundergust Lake-17	02040206150060-01
Timber Lake-19	02040202060030-01
Timberline Lakes-14	02040301200030-02
Tomahawk Lake-01	02040105150040-01
Toms Lake-04	02030103120030-01
Topanemus Lake-09	02030105150020-01
Tuckahoe Lake-15	02040302070070-01
Turkey Swamp-12	02030104100010-01
Turnmill Lake-13	02040301070010-01
Union Lake-17	02040206160030-01

2006 Assessment Unit	2008 Assessment Unit
Union Mill Lake-19	02040202060040-01
Upper Aetna Lake-19	02040202060030-01
Upper East Highland Lake-02	02020007040040-01
Upper Greenwood Lake-02	02020007040060-01
Upper Mohawk Lake-01	02040105040050-01
Upper Mt. Glenn Lake-03	02030103070040-01
Upper Mt. Hope Lake-06	02030103030110-01
Upper Sylvan Lake-20	02040201110010-01
Valhalla Lake-06	02030103030160-01
Vernon Valley Lake-02	02020007040020-01
Verona Park Lake-04	02030103120010-01
View Lake-16	02040302080030-01
Vincentown Millpond-19	02040202050080-01
Wallkill Lake-02	02020007030030-01
Wampum Lake-12	02030104080020-01
Wanaque Reservoir-03	02030103070050-01
Wapalanne Lake-01	02040104140030-01
Washington Lake-03	02030103070070-01
Washington Lake-18	02030103070070-01
Washington Valley Reservoir-09	02030105120060-01
Watchu Pond-01	02040105150080-01
Watchung Lake-09	02030105120030-01
Wawayanda Lake-02	02020007040040-01
Weamaconk Lake-09	02030105150010-01
Weequahic Lake-07	02030104010010-01
Wells Mills Reservoir-13	02040301110040-01
Wenonah Lake-18	02040202130040-01
West Lake-06	02030103030130-01
White Lake-01	02040105050010-01
White Lake-02	02020007010040-01
White Meadow Lake-06	02030103030110-01
White Rock Lake-06	02030103030020-01
Whitesbog Pond-19	02040202030050-01
Willow Grove Lake-17	02040206140010-01
Willow Pond-20	02040201040020-01
Wilson Lake-17	02040206130010-01
Wood Lake-19	02040202060030-01
Woodbury Lake-18	02040202120100-01
Wreck Pond-12	02030104090080-01