DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER MONITORING AND STANDARDS

ADOPTION OF AMENDMENTS TO THE LOWER RARITAN/ MIDDLESEX WATER QUALITY MANAGEMENT PLAN, MERCER COUNTY WATER QUALITY MANAGEMENT PLAN, MONMOUTH COUNTY WATER QUALITY MANAGEMENT PLAN, NORTHEAST WATER QUALITY MANAGEMENT PLAN, UPPER DELAWARE, AND UPPER RARITAN WATER QUALITY MANAGEMENT PLAN TO ESTABLISH TOTAL MAXIMUM DAILY LOADS IN THE RARITAN RIVER BASIN ADDRESSING PHOSPHORUS, DISSOLVED OXYGEN, pH AND TOTAL SUSPENDED SOLIDS IMPAIRMENTS

Public Notice

Take notice that on **May 24, 2016** pursuant to the provisions of the New Jersey Water Quality Management Planning Act, N.J.S.A 58:11A-1 et seq., and the Statewide Water Quality Management Planning rules, N.J.A.C. 7:15-3.4, the New Jersey Department of Environmental Protection (Department) adopted amendments to the Lower Raritan/Middlesex Water Quality Management Plan (WQMP), Mercer County WQMP, Monmouth County WQMP, Northeast WQMP, Upper Delaware WQMP, and Upper Raritan WQMP. The amendments establish 46 Total Maximum Daily Loads (TMDLs) to address phosphorus, dissolved oxygen, pH, and total suspended solids impairments in the non-tidal Raritan River Basin. This includes portions of Hunterdon, Mercer, Middlesex, Monmouth, Morris, Somerset, and Union Counties, in Watershed Management Areas (WMAs) 8, 9 and 10 in the Raritan Water Region.

A TMDL represents the assimilative or carrying capacity of a waterbody, taking into consideration point and nonpoint sources of pollutants of concern, natural background, and surface water withdrawals. A TMDL quantifies the amount of a pollutant a waterbody can assimilate without violating the state's water quality standards (SWQS), allocates that load capacity to known point and

nonpoint sources, and is expressed as the sum of Waste Load Allocations (WLAs) for point sources, Load Allocations (LAs) for nonpoint sources, a required Margin of Safety (MOS), and an optional Reserve Capacity (RC). TMDLs are required, under Section 303(d) of the Federal Clean Water Act, 33 U.S.C. 1313(d), to be developed for waterbodies that cannot meet water quality standards after the implementation of technology-based effluent limitations.

The *New Jersey 2012 Integrated Water Quality Monitoring and Assessment Report (NJR January 5, 2015)* identified water quality impairments based on designated use attainment and then listed the parameters responsible for the non-attainment of the designated use. The water quality assessments were conducted for each of the seven categories of designated use, which include aquatic life, recreational use (primary and secondary contact), drinking water, fish consumption, shellfish harvesting (if applicable), agricultural water supply use and industrial water supply use. Sublists 1 through 4 include waterbodies that are generally unimpaired (Sublist 1 and 2), have limited assessment or data availability (Sublist 3), or are impaired due to pollution rather than pollutants or have had a TMDL or other enforceable management measures approved by EPA (Sublist 4). Sublist 5 constitutes the traditional 303(d) list for waters impaired or threatened by one or more pollutants, for which a TMDL may be required. For the Raritan River Basin, the *2012 Integrated List of Waterbodies* identified 71 assessment units as impaired for total phosphorus (TP), pH, dissolved oxygen (DO), and/or total suspended solids (TSS) based on in-stream concentrations not meeting the applicable SWQS for the pollutant. An additional 18 impairments were found based on the data gathered during the TMDL study, resulting in a total of 89 impairments that were considered under the TMDL study. At the conclusion of the study, it was determined that TMDLs were not warranted or could not be prepared at this time for some of the identified impairments. The basis for these determinations is discussed more fully in the TMDL report. Through this TMDL document and supporting reports, the Department adopts 46 TMDL identified in Table 1 below.

Table 1. Assessment units addressed by the TMDL report

TMDL	Watershed (HUC 14)	Name of Watershed	Parameter	Priority Ranking from 2012 List*
1[a]	NJ02030105010060-01	Raritan R SB(Califon br to Long Valley)	pH	NA**
2[a]	NJ02030105010080-01	Raritan R SB(Spruce Run-StoneMill gage)	TP	NA**
3[a]	NJ02030105020050-01	Beaver Brook (Clinton)	TP	H
4[a]	NJ02030105020070-01	Raritan R SB(River Rd to Spruce Run)	TP	H
5[a]	NJ02030105020070-01	Raritan R SB(River Rd to Spruce Run)	TSS	H
6[a]	NJ02030105020080-01	Raritan R SB(Prescott Bk to River Rd)	TSS	NA**
7[a]	NJ02030105020100-01	Raritan R SB(Three Bridges-Prescott Bk)	TP	H
8[a]	NJ02030105020100-01	Raritan R SB(Three Bridges-Prescott Bk)	TSS	NA**
9[a]	NJ02030105030060-01	Neshanic River (below FNR / SNR confl)	TP	H
10[a]	NJ02030105030070-01	Neshanic River (below Black Brk)	TP	H
11[a]	NJ02030105040010-01	Raritan R SB(Pleasant Run-Three Bridges)	TP	H
12[a]	NJ02030105040030-01	Holland Brook	TP	NA**
13[a]	NJ02030105040040-01	Raritan R SB(NB to Pleasant Run)	pH	H
14[a]	NJ02030105040040-01	Raritan R SB(NB to Pleasant Run)	TP	H
15[b]	NJ02030105050020-01	Lamington R (Hillside Rd to Rt 10)	TP	H
16[b]	NJ02030105050070-01	Lamington R(HallsBrRd-HerzogBrk)	TP	H
17[b]	NJ02030105050070-01	Lamington R(HallsBrRd-HerzogBrk)	pH	NA**
18[b]	NJ02030105050090-01	Rockaway Ck (below McCrea Mills)	TP	H
19[b]	NJ02030105050100-01	Rockaway Ck SB	TP	H
20[b]	NJ02030105050100-01	Rockaway Ck SB	TSS	H
21[b]	NJ02030105060040-01	Raritan R NB (Peapack Bk to McVickers Bk)	TP	NA**
22[b]	NJ02030105060040-01	Raritan R NB(Peapack Bk to McVickers Bk)	TSS	NA**
23[b]	NJ02030105080020-01	Raritan R Lwr (Rt 206 to NB / SB)	TP	H
24[b]	NJ02030105080030-01	Raritan R Lwr (Millstone to Rt 206)	TP	NA**
25[b]	NJ02030105080030-01	Raritan R Lwr (Millstone to Rt 206)	TSS	NA**
26[c]	NJ02030105090050-01	Stony Bk(Province Line Rd to 74d46m dam)	TP	H
27[c]	NJ02030105090060-01	Stony Bk (Rt 206 to Province Line Rd)	TP	H
28[c]	NJ02030105090070-01	Stony Bk (Harrison St to Rt 206)	TP	H
29[d]	NJ02030105090090-01	Stony Bk- Princeton drainage	TP	H
30[e]	NJ02030105100010-01	Millstone River (above Rt 33)	TP	H
31[e]	NJ02030105100010-01	Millstone River (above Rt 33)	TSS	H
32[e]	NJ02030105100020-01	Millstone R (Applegarth road to Rt 33)	TP	H
33[e]	NJ02030105100020-01	Millstone R (Applegarth road to Rt 33)	TSS	H
34[e]	NJ02030105100030-01	Millstone R (RockyBk to Applegarth road)	TP	H
35[e]	NJ02030105100050-01	Rocky Brook (below Monmouth Co line)	TP	H

TMDL	Watershed (HUC 14)	Name of Watershed	Parameter	Priority Ranking from 2012 List*
36[e]	NJ02030105100060-01	Millstone R (Cranbury Bk to Rocky Bk)	DO	NA**
37[e]	NJ02030105100060-01	Millstone R (Cranbury Bk to Rocky Bk)	TP	H
38[e]	NJ02030105100090-01	Cranbury Brook (below NJ Turnpike)	TP	NA**
39[e]	NJ02030105100110-01	Devils Brook	TP	NA**
40[e]	NJ02030105100130-01	Bear Brook (below Trenton Road)	TP	H
41[e]	NJ02030105100140-01	Millstone R (Rt 1 to Cranbury Bk)	TP	H
42[d]	NJ02030105110020-01	Millstone R (Heathcote Bk to Harrison St)	TP	NA**
43[f]	NJ02030105110050-01	Beden Brook (below Province Line Rd)	TP	H
44[f]	NJ02030105110100-01	Pike Run (below Cruser Brook)	TP	H
45[g]	NJ02030105120130-01	Green Brook (below Bound Brook)	TSS	M
46[g]	NJ02030105120140-01	Raritan R Lwr(I-287 Piscatway-Millstone)	TSS	M

Footnotes:

The assessment unit was addressed by the TMDL area presented in Table 5 through Table 10 of the TMDL: a - South Branch Raritan River Watershed TMDL; b - North Branch Raritan River Watershed TMDL; c - Stony Brook Watershed TMDL; d - Carnegie Lake Direct Watershed TMDL; e - Upper Millstone River Watershed TMDL; f - Beden Brook Watershed TMDL; and, g - Lower Millstone/Mainstem Raritan River Watershed TMDL.

* The 303(d) List includes the priority ranking ("high", "medium", or "low") assigned to these waters for TMDL development. A detailed explanation of the priority ranking process can be found in Section 8 of the 2012 Methods Document.

** Impairment identified through supplemental data review as part of the TMDL study; these did not have a 2012 303(d) List assigned priority ranking and therefore are marked as Not Applicable (NA) in the table.

Assistance in developing the model used to calculate the TMDLs was provided by Kleinfelder/Omni under contract through the Rutgers New Jersey EcoComplex. The Kleinfelder/Omni reports (2005, 2013) describe the development of the integrated hydrodynamic and water quality models used to develop the TMDLs. These documents are available as described below. The water quality model used was Water Quality Analysis Simulation Program 7.1 (WASP 7.1), and the hydrologic model used was named HydroWAMIT (Hydrologic and Watershed Model Integration Tool). The latter component provides hydrodynamic and nonpoint source inputs to WASP 7.1. The study area was divided into five subbasins for which models were constructed and calibrated for nutrients, DO and TSS. The linked models were used to simulate water quality and flow in the non-tidal Raritan River and to calculate the pollutant load reductions needed to ensure attainment of SWQS for the subject parameters.

The total allowable load was disaggregated among wasteload allocations for point sources and load allocations for nonpoint sources, along with a required margin of safety. A reserve capacity was also included recognizing the need to allow for loads that would be associated with additional growth in the study area. The WLAs and LAs, MOS and RC are summarized in Tables 5 through 11 in Section 5.0 of the Department's TMDL document. The amendment includes the TMDL document as well as the detailed reports and references that provide the technical and regulatory basis for this TMDL. These documents are available from the Department as described below, and can be found on within the "New Jersey TMDL" link on the Department website at: http://www.nj.gov/dep/wms/bears/tmdls.html

Specified reductions established through these TMDLs will be achieved through the issuance of New Jersey Pollution Discharge Elimination System (NJPDES) permits with effluent limits consistent with the WLAs set forth in the TMDLs and a suite of best management practices (BMPs) and other measures to reduce loads from stormwater point sources and nonpoint sources of phosphorus. The Wastewater Treatment Plant WLAs identified in Table 2 have been assigned through the TMDLs.

Table 12: TMDL Condition for Wastewater Treatment Plants

NJPDES #	Facility Name	Permitted Flow	Effluent Concentrations and Loads Associated with TMDL Condition							
			May October				November April			
			OrthoP (mg/L)	TP (mg/L)	TP (kg/d)	TSS (mg/L)	OrthoP (mg/L)	TP (mg/L)	TP (kg/d)	TSS (mg/L)
NJ0028304[a]	Day's Inn - Roxbury - Ledgewood Property (1), (4)	0.04	0.08	0.50	0.08	n/a	0.11	0.50	0.08	n/a
NJ0021954[a]	Mt Olive Twp - Clover Hill STP (1), (4)	0.5	0.08	0.62	1.18	17.0	0.11	1.00	1.89	17.0
NJ0023493[a]	Washington Twp-Schooley's Mt (1)	0.5	0.08	0.68	1.29	10.0	0.11	0.71	1.35	10.0
NJ0109061[a]	Washington Twp-Long Valley (1)	0.244	0.08	1.34	1.24	30.0	0.11	1.37	1.27	30.0
NJ0028487[a]	NJDC Youth Correct-Mt View	0.26	0.09	0.18	0.18	30.0	0.13	0.25	0.25	30.0
NJ0078018[a]	Clinton West	0.25	0.09	0.18	0.17	30.0	0.13	0.25	0.24	30.0
NJ0035084[a]	Exxon Research & Eng Co	0.22	0.09	0.18	0.15	30.0	0.13	0.25	0.21	30.0
NJ0020389[a]	Town of Clinton WTP (1)	2.03	0.14	2.00	15.37	30.0	0.20	2.00	15.37	30.0
NJ0100528[a]	Glen Meadows/Twin Oaks (1)	0.025	0.43	2.23	0.21	n/a	0.61	2.41	0.23	n/a
NJ0028436[a]	Flemington Boro (wet weather only) (2)	3.85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NJ0022047[a]	Raritan Twp MUA (1)	3.8	0.14	1.31	18.90	30.0	0.20	1.86	26.75	30.0
NJ0000876[b]	Hercules Kenvil Works Facility (4)	0.135	0.30	0.59	0.30	n/a	0.50	1.00	0.51	n/a
NJ0022675[b]	Roxbury Twp-Ajax Terrace	2.0	0.10	0.20	1.50	16.0	0.18	0.36	2.73	16.0
NJ0026824[b]	Chester Shopping Center (1)	0.011	0.41	2.21	0.09	n/a	0.54	2.34	0.10	n/a
NJ0022781[b]	Valley Rd Sewer Co - Pottersville STP (1)	0.048	0.41	2.21	0.40	n/a	0.54	2.34	0.43	n/a
NJ0021865[b]	Fiddler's Elbow CC - Reynwood Inc (1)	0.03	0.41	2.21	0.25	n/a	0.54	2.34	0.27	n/a
NJ0102563[b]	Route 78 Office Area – Tewksbury	0.09653	0.07	0.13	0.05	n/a	0.12	0.23	0.08	n/a
NJ0023175[b]	Clinton BOE - Round Valley	0.009	1.25	2.50	0.09	n/a	1.25	2.50	0.09	n/a
NJ0098922[b]	Readington-Lebanon SA (1)	1.45	0.14	1.40	7.66	22.0	0.18	1.44	7.90	22.0
NJ0021334[b]	Mendham Boro (4)	0.45	0.27	0.54	0.92	30.0	0.36	0.72	1.23	30.0
NJ0026387[b]	Bernardsville	0.8	0.20	0.41	1.23	15.0	0.27	0.54	1.64	15.0
NJ0033995[b]	Environmental Disposal Corporation	2.1	0.25	0.50	3.97	20.0	0.25	0.50	3.97	20.0
NJ0029475[e]	Hightstown Boro Advanced WWTP	1.0	..	0.12	0.44	30.0	..	0.12	0.44	30.0
NJ0023787[e]	East Windsor Twp MUA	4.5	..	0.12	1.99	30.0	..	0.12	1.99	30.0
NJ0024104[e]	Princeton Meadows STP (3)	1.64	..	0.12	0.73	30.0	..	0.12	0.73	30.0
NJ0023922[e]	USDOE PPPL	0.637	..	0.09	0.22	n/a	..	0.09	0.22	n/a
NJ0000272[e]	David Sarnoff Research	0.096	..	0.35	0.13	n/a	..	0.35	0.13	n/a

NJPDES #	Facility Name	Permitted Flow	Effluent Concentrations and Loads Associated with TMDL Condition							
			May October				November April			
			OrthoP (mg/L)	TP (mg/L)	TP (kg/d)	TSS (mg/L)	OrthoP (mg/L)	TP (mg/L)	TP (kg/d)	TSS (mg/L)
NJ0031445[e]	Firmenich Inc	0.036	..	0.35	0.05	n/a	..	0.35	0.05	n/a
NJ0000795[c]	Bristol-Myers Squibb Co	0.172	..	0.18	0.12	5.0	..	0.18	0.12	10.0
NJ0035319[c]	Stony Brook RSA Pennington	0.445	..	0.18	0.30	5.0	..	0.18	0.30	10.0
NJ0000809[c]	Hopewell Business Park	0.128	..	0.18	0.09	30.0	..	0.18	0.09	30.0
NJ0022110[c]	Educational Testing Service	0.08	..	0.18	0.05	20.0	..	0.18	0.05	20.0
NJ0035301[f]	Stony Brook RSA - Hopewell	0.3	..	0.22	0.25	5.0	..	0.54	0.61	10.0
NJ0069523[f]	Cherry Valley STP	0.29	..	0.22	0.23	4.0	..	0.54	0.58	4.0
NJ0022390[f]	NJDHS - N Princeton Dev Center	0.5	..	0.22	0.41	n/a	..	0.54	1.02	n/a
NJ0023663[f]	Carrier Foundation Rehab STP	0.04	..	0.70	0.11	n/a	..	1.00	0.15	n/a
NJ0060038[f]	Montgomery Twp-Pike Brook	0.67	..	0.23	0.59	20.0	..	0.30	0.76	20.0
NJ0026140[f]	J & J Consumer Products	0.063	..	0.70	0.17	n/a	..	1.00	0.24	n/a
NJ0067733[f]	Montgomery Twp - Oxbridge	0.088	..	0.20	0.07	n/a	..	1.00	0.33	n/a
NJ0031119[g]	Stony Brook RSA-River Road	13.06	..	..	..	30.0	..	..	..	30.0
NJ0026905[g]	Montgomery Twp-Stage II	0.48	..	..	..	30.0	..	..	..	30.0
NJ0023019[g]	Industrial Tube Corp	0.012	..	..	..	20.0	..	..	..	20.0
NJ0050130[g]	Montgomery Twp - Riverside	0.145	..	..	..	30.0	..	..	..	30.0
NJ0024864[g]	Somerset Raritan SA	24.3	..	..	..	30.0	..	..	..	30.0
NJ0026727[g]	Colorado Café	0.018	..	..	..	30.0	..	..	..	30.0

Footnotes:

Facility discharges to TMDL area given in Table 5 through Table 10 of the TMDL: a - South Branch Raritan River Watershed TMDL; b - North Branch Raritan River Watershed TMDL; c - Stony Brook Watershed TMDL; d - Carnegie Lake Direct Watershed TMDL; e - Upper Millstone River Watershed TMDL; f - Beden Brook Watershed TMDL; and, g - Lower Millstone/Mainstem Raritan River Watershed TMDL.

1) Eleven (11) WWTPs where Ortho P input concentration reductions were needed to meet the TMDL DO-pH endpoints.
2) The actual intermittent flow reported in Discharge Monitoring Report (DMR) was used to characterize the wet weather load contributions from Flemington Boro WWTP for both existing and TMDL conditions. Effluent quality was modeled at the 90th percentile of DMR data. Facility discharges only during storm events and therefore does not impact productivity. No WLA or effluent limits are required to comply with this TMDL.
3) For Princeton Meadows WWTP the model inputs for ammonia under the TMDL condition were set to 6.64 mg/l in summer and 10.33 mg/l in winter, equivalent to the derived NJPDES toxicity limits. The TMDL model simulation ensured that the applicable DO criteria are met under these inputs. It is expected that the derived NJPDES toxicity limits will be included upon permit renewal.

4) Discharges above or into waters designated as Category 1, therefore existing effective permit limits must be retained.
n/a - not applicable

These amendments were noticed in the New Jersey Register on June 16, 2014 at 46 N.J.R. 1485(c). A public hearing was held on July 16, 2014 at the Somerset County Administration Building. The Department is adopting these amendments to the Northeast Water Quality Management Plan (WQMP), Upper Raritan WQMP, Lower Raritan/Middlesex WQMP, Mercer County WQMP and Monmouth County WQMP pursuant to N.J.A.C. 7:15-3.4. The TMDL report for the amendments is entitled *Total Maximum Daily Load Report for the Non-Tidal Raritan River Basin addressing Total Phosphorus, Dissolved Oxygen, pH and Total Suspended Solids Impairments.* All information related to the amendments is located at the Department, Division of Water Monitoring and Standards, Bureau of Environmental Analysis, Restoration and Standards, 401 East State Street, Trenton, NJ 08625-0420. If you wish to receive a copy of the TMDL documents, and/or supporting materials, please call the Division of Water Monitoring and Standards at (609) 633-1441. The Department's file is available for inspection between 8:30 a.m. and 4:00 p.m., Monday through Friday. An appointment to inspect the documents may be arranged by calling the Division of Water Monitoring and Standards at the above number. The TMDL reports and the basis documents developed on behalf of the Department are available for download from: http://www.state.nj.us/dep/wms/bears/tmdls.html

No formal comments were received during the July 16, 2014 public hearing. The comment period closed on August 15, 2014. Comments on the amendments received during the public comment period are summarized below with the Department's responses.

Summary of Public Comments and Department Responses:

The following commenters (listed alphabetically) submitted written comments on the proposed TMDLs:

A. Heinrich, Helen for the New Jersey Farm Bureau via letter dated August 14, 2014
B. Minch, Frank for the New Jersey Department of Agriculture's Division of Agriculture and Natural Resources via letter dated August 15, 2014
C. Navatto, Bernard for the Somerset County Board of Chosen Freeholders via letter dated August 4, 2014
D. Roberts, Camela for the Borough of Hightstown via Letter dated August 15, 2014
E. Sheneman, Robert for the Princeton Plasma Physics Laboratory via letter dated August 14, 2014
F. Smith, Gail for the Township of Montgomery via letter dated July 28, 2014
G. Waltman, Jim for the Stony Brook-Millstone Watershed Association via letter dated August 15, 2014

Department initiated changes to the proposed TMDL document were required to incorporate the USEPA approved 2012 New Jersey Integrated Report, therefore, the 2010 assessment information and maps presented in Table 1, Table 2, and Figure 3 through Figure 6 were revised. The Department also initiated changes to rectify differences between the finalized 2012 Integrated Water Quality Monitoring and Assessment Report and the current Raritan River TMDL report for USEPA approval and subsequent adoption. The conclusions reached by BEARS technical staff are outlined below.

The discrepancies were reviewed and revised in the current TMDL report included 12 Assessment Unit (AU)/waterbody impairment delistings. The majority of the issues between the assessment outcome

and the TMDL finding stem from the more comprehensive review of water quality data in a TMDL effort. While the 2012 listing methods defined certain procedures for water quality determinations, the water quality data review performed in TMDL development can consider: data from a larger time extent, variability in sampling conditions, and other factors to aid in addressing any waterbody impairment. In this instance, the ability of data management systems to include and represent diurnal sampling results may be responsible for inaccurate delisting of a waterbody. TMDL decisions where differences existed and were addressed include:

- The TMDL includes TSS impairment for both AU NJ02030105020080 and NJ02030105020100. The number and pattern of exceedances in the assembled TMDL data set support relisting. The impairment is addressed by this TMDL.
- The proposed TMDL included TSS impairment for AU NJ02030105040040. The assembled TMDL data set support the 2012 delisting. The impairment is removed from this TMDL report.
- The proposed TMDL included TSS impairment for AU NJ02030105050070. The assembled TMDL data set support the 2012 delisting. The impairment is removed from this TMDL report.
- The TMDL includes pH impairment for AU NJ02030105050070. The diurnal exceedances in the assembled TMDL data set support relisting. The impairment is addressed by this TMDL.
- The TMDL includes TSS impairment for AU NJ02030105060040. The number and pattern of exceedances in the assembled TMDL data set support relisting. The impairment is addressed by this TMDL.
- The TMDL includes TP and TSS impairment for AU NJ02030105070030. The assembled TMDL data set support the 2012 delisting. The impairment is removed from this TMDL report.
- The TMDL includes TSS impairment for AU NJ02030105080030. The assembled TMDL data set including site RR1 support relisting. The impairment is addressed by this TMDL.

- The TMDL includes TSS impairment for AU NJ02030105110010. The assembled TMDL data set support the 2012 delisting. The impairment is removed from this TMDL report.
- The TMDL includes TP impairment for AU NJ02030105110020. The assembled TMDL data set support relisting. The impairment is not addressed by this TMDL.
- The TMDL includes TSS impairment for AU NJ02030105120180. The assembled TMDL data set support the 2012 delisting. The impairment is removed from this TMDL report.

These edits were necessary for USEPA's work in tracking Department progress in addressing impaired waters. Lastly, the Department has edited and made some revisions to clarify various parts of the TMDL document. Some of these changes were needed to address input received from the public as discussed further below. The changes did not affect the TMDL calculations and, based on their limited scope, are viewed as less than a substantive change.

A summary of the comments and the Department's responses to those comments were grouped by topic and follow below. The letter(s) in brackets at the end of each comment corresponds to the commenter(s) listed above.

AGRICULTURAL SOURCES:

1. Comment: The assigned watershed-specific percent reductions of loads from urban and agricultural land areas cannot be achieved given the lack of NRCS stormwater related BMPs, technical engineering assistance, and cost-share funding. NRCS cannot meet the demand for farm conservation plans today with its limited resources. All preserved farms are required to get a farm conservation plan appropriate

for their specific property, but there is a long waiting list for assistance. This may prevent meeting TMDL goals through BMPs. Funding for the implementation of Best Management Practices on farms has been reduced at both the Federal and State level. Consideration should be made to seek additional sources of funding to aid in the development and installation of agricultural best management practices. (A),(B)

Response to Comment 1: The Department recognizes that achieving nonpoint source load reductions may take time. The measures available to achieve these reductions are generally non-regulatory in nature and some depend on programs, such as those provided by the NRCS and Farm Bill assistance programs like EQIP, which have finite capacity to provide technical and/or financial assistance. It is beyond the scope of the TMDL to seek additional sources of funding under Farm Bill or related programs. However, implementation of TMDLs is a factor considered when prioritizing award of available assistance. Further, the TMDL identifies measures that have been or are continuing to be implemented to advance the attainment of water quality standards in the Raritan River basin. Incremental improvement is an acceptable path to achieving the overall water quality objective. Progress towards the goal will be measured through existing ambient monitoring programs. Over time, the implementation plan can be re-evaluated if water quality goals are not being met.

2. Comment: The Land Use/Land Cover mapping data used this report is dated 2002. Regulations are usually based on "the best available data". There is more up-to-date DEP mapping information and the 2012 US Census of Agriculture information. Will the TMDL and its model assumptions be updated as new information is available? (A)

3. Comment: The simulations are dated (based on information from 2002-2005). Before any more detailed implementation plans are developed, the latest information about agriculture (e.g. the 2012 Census of Agriculture) and determination whether the land is privately or publicly owned should become the basis for "agricultural use" acreage numbers and percentages. (B)

4. Comment: Changes in land use must be incorporated into this assessment. The report uses the 2002 land use/land cover mapping as the basis for estimating the acreage devoted to agricultural lands. As the number of acres in agricultural production has declined since 2002, it would appear that the remaining agricultural lands would be expected to do even more to achieve the targeted TMDL reductions. It is recommended that an updated land use assessment and additional water quality sampling be done prior to establishing such stringent parameters for agricultural land uses. (B)

Response to Comments 2 through 4: The 2002 land use data matches the time frame under which the water quality data was gathered to construct/calibrate the model that was used to develop the TMDL. It is the best fit possible. Revising the model with land use data from beyond the calibration window would not be appropriate as it would likely decrease the confidence in the model's predictive power.

If there had been no progress made to reduce pollutant load associated with the land use types assigned load reductions and the relative distribution of the land use types changed significantly, the assigned load reduction based upon the 2002 land uses may not be entirely aligned with success in achieving the TMDL due to the different pollutant loading contributions associated with each land use. However, this situation is not the case. As noted in response to Comment 1, measures have been and continue to be implemented that are contributing to the needed load reductions across all land uses, including

agricultural. The Department also evaluated the most recent available land use data, which is from 2007, and compared it to the 2002 land use coverage for each modeled area. The percent difference in land use was found to vary by subbasin. There was an overall 5.7% agricultural land use conversion across the entire modeled watershed. While it is not possible to fully quantify the water quality effect of the land use changes that have occurred since TMDL calculation, the Margin of Safety (MOS) within the TMDL equation is included to account for uncertainty associated with any and all of the elements required to determine the load reductions needed to achieve surface water quality standards. The small degree of land use conversion and the dynamic nature of implementation of best practices are adequately accounted for through the MOS and do not translate into remaining agricultural lands being required to increase pollutant load reduction.

5. Comment: Since this TMDL effort began prior to 2004, thousands of State and Federal dollars have been spent on measures to reduce NPS pollution in the Basin by installing riparian buffers, doing streambed management, and using Federal EQIP and State Soil and Water Conservation grants to reduce various forms of pollution. The TMDL should account for this investment and the scale of these reduction efforts. (A)

6. The proposed TMDL is based on water quality sampling conducted in 2004. Agricultural impacts to water quality may have changed due, in part, to implementation of conservation practices such as Agricultural Mini-Grants, River Friendly Farm Certification Program, and Environmental Quality Incentive Program in the past 10 years. The New Jersey Department of Agriculture (NJDA) Animal Waste Management regulations have been in effect since 2010

and require landowners with livestock or those lands applying manure to implement best management practices.(B)

Response to Comments 5 and 6: The Department acknowledges that there has been progress made to date in achieving the load reductions specified in the TMDL. Many of these efforts have been recognized in the TMDL document in Section 7.0, Implementation Plan. The Department expects that continued progress in implementing conservation practices, along with the suite of other implementation strategies discussed, will be successful in attaining the SWQS over time.

7. Comment: Though the report reiterates that this TMDL is for "guidance" purposes, it is supposed to be implemented by various "partners", presumably regional agencies and municipalities who, we fear, may accept the report's data and estimates as fact, thus providing an erroneous and misleading basis for those actions. That is why it is important for the Department to give the riparian buffer paper to counties and municipalities as a model of how to go about working with one of the agricultural aspects of the plan. (A)

Response to Comment 7: The TMDL contains regulatory and non-regulatory implementation of waste load allocations and load allocations, therefore, characterization of the TMDL as "guidance" is inaccurate. The citations for the report or to the paper mentioned by the commenter were not provided, so it is not possible to further respond regarding this characterization. The Department agrees that riparian buffers are one of the many BMPs that

can reduce pollutant loading and has identified this practice as one of the measures to be employed to achieve land use related pollutant loads, see Section 7 and Appendix E. The Department has provided a model ordinance on its web page at http://www.nj.gov/dep/wqmp/docs/riparian_model_ordinance.pdf.

8. Comment: It is unacceptable to load greater reductions of some pollutants upon the agricultural "land use" because wastewater treatment plants or other land uses in the area either cannot or will not assume responsibility for their contributions to the problem. The expense of BMPs and required loss of productive land to install them will be a cost that won't be balanced by any demonstrable benefits for many years. A larger percentage reduction is assigned to the agricultural land use without a produced mathematical result that this would have a measurable effect on water quality. (A)

Response to Comment 8: The TMDL distributed load reductions across all anthropogenic pollutant sources only to the extent needed in order to meet various defined endpoints. As illustrated in TMDL Allocation Tables 5 through 11, reductions from both point and non-point sources are necessary to achieve the targeted water quality at the critical locations. A slightly higher reduction was assigned to agricultural land use compared to urban land use as explained in the Kleinfelder/Omni Phase II Final Report (Kleinfelder/Omni, 2013, Volume 1 of 3, p. 158): "...where most of the stormwater load was being generated from agricultural areas, the NPS reduction for agricultural areas was increased independently from urban

areas." This was necessary for achievement of the target water quality and relates to the significance of the agricultural land use source in these locations.

9. Comment: Runoff data was developed from monitoring under Phase 1 of the TMDL. Given all the high water events that have occurred since data collection is the data still relevant?

Response to Comment 9: The Raritan TMDL study included an improved method in assigning land use runoff coefficients for the purpose of modeling. Compared to the common practice of using literature values that are derived based on the data collected from a larger geographical extent (i.e. state-wide averages), the monitoring program for this TMDL study was designed so that runoff monitoring results could differentiate among areas based on geology and land use within the subject watershed and provide region specific values for modeling purposes. The runoff values captured a range of conditions that are representative of the watershed and were appropriate for calculating a TMDL. Transient high flow events may temporarily affect runoff quality by washing off accumulated pollutants, resulting in a short term increase in load followed by a decrease till there is time for a build up to occur. However, this short term variability in runoff does not affect the validity of using the longer term conditions reflected in the coefficients used to calculate the Raritan TMDLs.

10. Comment: The "agricultural land use" is not specific about ownership. Much of it may be in public ownership and rented to farmers for agricultural purposes. (A)

Response to Comment 10: Aerial characterization of the agricultural land use in the TMDL study area was completed on a scale appropriate to the modeling effort. The same loading estimation approach was used for the each type of land use, independent of land ownership. Ownership status is not essential to calculating the TMDL loading or the load allocation assigned to agricultural land use.

11. Comment: Calculating pollutant loading as if the entire Basin were covered with forest is an interesting concept, but it is an unreasonable expectation that all human use must be removed to produce this "natural condition". (A)

Response to Comment 11: Estimating the water quality conditions that would hypothetically occur under natural conditions allows the Department to determine if meeting the applicable water quality criterion is achievable in a particular situation, such as in a specific lake. Achieving land use changes that were hypothetically assumed in order to calculate natural conditions is not the objective of this exercise. The SWQS provide that, if natural conditions are less stringent than the otherwise articulated surface water quality criterion, the natural conditions would supersede the numeric criterion. Where this was found to be the case, the natural water quality condition was the target in calculating load reductions, in lieu of the unattainable numeric criterion.

12. Comment: Page 137 notes that "it is not possible to determine how long it would take after NPS runoff improvements are made before base-flow quality might be expected to improve".

Due to pollutant build-up in sediments over time, positive results from what might be major, expensive changes in farm operations will be difficult to demonstrate. (A)

Response to Comment 12: The Department is committed to monitoring water quality as a means to continually measure effectiveness of TMDL implementation. Although the time frame for full restoration of water quality is not predetermined and there is a challenge in demonstrating pollutant reductions on an individual parcel or area basis, pollutant reduction for agricultural and other land uses was factored into the model and is reflected in the required final load reductions.

13. Comment: Installing BMPs that would reduce sediment loads and provide bank stabilization in these agriculturally-dominated watersheds takes engineering expertise. Farmland owners would have to hire if the usual agricultural support agencies had none to offer. This cost could not be passed on to the buyers of the farm's output. (A)

Response to Comment 13: The Department affirms that the NPS load reductions depend largely on non-regulatory measures that are largely supported through NRCS technical assistance and Farm Bill funding. As the result of this support, it is difficult to know the degree to which the producer community would incur uncompensated costs. Cost-effectiveness of agriculture best management practices was evaluated by the United States Department of Agriculture's (USDA) August 2013 Final Report entitled "Building Capacity to Analyze the Economic Impacts of Nutrient Trading and Other Policy Approaches for

Reducing Agriculture's Nutrient Discharge into the Chesapeake Bay Watershed" (http://www.usda.gov/oce/environmental_markets/files/EconomicTradingCBay.pdf). The report presents that some BMPs may increase farm profits, further complicating the task of estimating the cost of implementation to the producer. One example presented in the report was that conservation tillage can increase profitability by reducing input costs and through long term gains in productivity.

14. Comment: The TMDL assigned percent reductions to achieve 100% compliance with the water quality standard without adequately supporting that the high pollutant reductions for agriculture would be possible. (A)

15. The effects of implementation of agriculture conservation practices and NJDA Animal Waste Management regulations are not quantified in this report, a 70%-84% load reduction from agricultural lands may be excessive and it is unclear as to how agricultural landowners will meet the target values. (B)

Response to Comments 14 and 15: Agricultural land use is significant in much of the drainage area studied. As such, it contributes a significant proportion of the pollutant loading and has been assigned a reduction target accordingly. Achieving these objectives will be a long term process. The Department regularly coordinates with the Department of Agriculture to address water quality issues related to agricultural land uses. The TMDL identifies a number of the technical and financial assistance programs available to support

this effort, as well as specific efforts that have been accomplished or are on-going to advance the objective of reducing pollutant loading. The effectiveness of these efforts and progress towards attaining SWQS will be measured through the ambient monitoring programs and the implementation strategies will be revisited as necessary if SWQS are not met.

16. Comment: The significant nonpoint source pollutant reductions are based on 10-year old water monitoring data. Public money has been spent on development of riparian buffers and reducing stormwater loading after the collected data. What is the appropriate baseline condition for calculating the NPS reductions in order to give credit for BMP installation? (A)

Response to Comment 16: Pollutant reductions defined in the TMDL are based on water quality data collected in the TMDL Phase I study, which was the basis for model calibration and the initial condition used for calculating the needed load reductions. The Department acknowledges that progress has been made to reduce pollutant loads since the initial condition. These reductions would constitute a portion of the overall reduction called for in the TMDL. Nevertheless, the ultimate test of the effectiveness of implementation will be the measured ambient water quality, not an accounting of the wasteload and load reductions accomplished. Following a reasonable period to allow for implementation of regulatory and non-regulatory implementation strategies, effectiveness would be reassessed.

17. Comment: Agricultural land use makes up only 2% of the land cover yet the TMDL would require 80% reductions in this area to meet standards. It is not fair or realistic that this small area could make any difference. (A)

Response to Comment 17: Overall, agricultural land covers approximately 18% of the TMDL study area and is of variable significance in each subwatershed. The commenter refers to an area that drains directly into Carnegie Lake. While agriculture constitutes a relatively small land area and contributes a small load relative to other land uses in the Carnegie Lake direct drainage area, it is an anthropogenic source and was assigned a load reduction as is appropriate for all anthropogenic sources.

WASTEWATER TREATMENT PLANT (WWTP) SOURCES:

18. Comment: How and who will pay for the necessary WWTP upgrades to reduce pollutants that exceed TMDL water quality targets. (A)

19. Comment: The wastewater treatment facilities that are required to modify their effluent limits per the adopted TMDL report should be given funding priority through the NJ Infrastructure Trust Fund Program. (C)

Response to Comments 18 and 19: Wastewater treatment plant effluent is a significant source of some pollutants addressed by the TMDL. If a WWTP is required to improve treatment to

meet the calculated WLAs, the Department has programs to help prioritize and fund treatment upgrades. 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 System describes the ranking methodology for the municipal water pollution control projects that are eligible for financial assistance through the Environmental Infrastructure Financing Program. The Priority List applies this methodology to rank specific projects that have requested consideration for financial assistance and identifies the estimated total eligible building costs under the appropriate project category. The current point system applies high points under project category to wastewater treatment improvement, second only to CSO projects. Projects that would address a water quality impairment would also receive high water quality points. In any case, to date, the Municipal Financing Program has been able to fund all eligible projects that have requested funding. While the Department does not expect the costs for upgrades to conform to the TMDL wasteload allocations to be burdensome, a permittee has the opportunity to request relief in this regard as provided under the Clean Water Act. Guidance for consideration of such relief is provided at http://water.epa.gov/scitech/swguidance/standards/economics/chaptr2.cfm.

20. Comment: Information about the technologies and strategies that can be employed by wastewater treatment facilities for addressing TMDL phosphorous limits should be provided in the TMDL. The ability to combine additives to settle-out and remove phosphorus should be an option. (C)

Response to Comment 20: The Department does not direct how a given facility must achieve effluent limits. There would be multiple options available to accomplish the required result and these are readily identified in the literature. Because each wastewater treatment facility has unique circumstances, for example, in terms of treatment type, physical equipment and flow paths within the facility, and site configuration, the responsible entity for each facility along with design professionals that they may consult are in the best position to determine the optimal means to achieve the required effluent limits.

21. Comment: The TMDL [page 45] specifies, "...the objective of the goal component in the NJPDES permits implementing the TMDL will be to achieve the WLA on an annual basis, since it cannot be known in advance if the critical conditions will occur in any given year." Where concentrations were specified to allow for seasonal flow conditions, the permit will need to include seasonal (summer/winter) goals to determine compliance with the model input values. Enhancing the resiliency of our wastewater infrastructure has emerged as a public and environmental health and safety priority and should also be a consideration when identifying solutions for addressing this TMDL. (C)

Response to Comment 21: The commenter cites a portion of the TMDL setting forth that the WLAs are targets to be met seasonally/annually to ensure SWQS are attained at critical locations under the range of conditions under which the SWQS apply. The TMDL report (page 32) states, "The critical conditions for any given location could occur in any given year; therefore, the WLA will need to be achieved on an annual basis." While the Department

intends to allow monthly variability in total phosphorus effluent quality (described on page 45 of the TMDL), a permitting component is also necessary to ensure that permits are effectively consistent with the WLAs set by the TMDL report on a seasonal/annual load basis, for the reasons described in the TMDL, Section 7.1. Some additional clarification of this issue has been added to the TMDL. Therefore, in addition to the average monthly limit (AML) value, the waste load allocation specified for each facility in Table 12 will be assigned through the NJPDES permit condition as an "action level(s)". The WLAs are expressed as daily loads, but the action level would be expressed as the sum of the daily loads allowed in each 6 month period, if seasonally variable limits are assigned, or over each 12 month period if there is no seasonally variable limit specified. Failure to achieve the action level may result in a revision of the applicable effluent limit in order to achieve the WLA. Clarification of the implementation strategy has been added to the TMDL document in Section 7.1.

The commenter adds that resiliency should be an additional consideration in defining the TMDL outcomes. The Department is aware of the need to ensure that public infrastructure, including wastewater treatment facilities, are prepared to deal with emergency situations to address public health and safety concerns. The Department intends to work cooperatively with regulated systems to implement measures that enhance the State's ability to sustain water sector operations throughout a broad range of meteorological or man-made conditions. Documents that elaborate on the strategy can be accessed through the Department's Division of Water Supply and Geoscience website *http://www.nj.gov/dep/watersupply* under "What's

New" or the Division of Water Quality webpage at http://www.nj.gov/dep/dwq under "Featured Topics".

Direct links to individual guidance documents are provided below:

- Emergency Response Planning: http://www.nj.gov/dep/watersupply/pdf/dwerp.pdf
- Asset Management Planning: http://www.nj.gov/dep/watersupply/pdf/guidance-amp.pdf
- Auxiliary Power: http://www.nj.gov/dep/watersupply/pdf/guidance-ap.pdf
- Infrastructure Resiliency: http://www.nj.gov/dep/watersupply/pdf/guidance-ifp.pdf

However, measures needed to foster public health and safety would not affect the calculation of the load reduction needed to meet SWQS for aquatic life support parameters, such as phosphorus and suspended solids.

22. Comment: Clarification should be added to the TMDL Implementation Section regarding the process and timeline wastewater treatment plant permit holders should expect to follow for addressing the new NJPDES permit requirements. It is recommended that the TMDLs be addressed at the time of permit renewal and that adequate advance notification be provided to affected NJPDES permit holders. (C)

Response to Comment 22: The Department plans to include effluent limits consistent with the TMDL WLAs upon renewal of each WWTP individual NJPDES permit. As is customary, the Department would include an appropriate compliance period from the effective date of the permit.

23. Comment: The New Jersey Water Quality Management Planning Rules (N.J.A.C. 7:15-5.25 (g)7) specifies that "a WMP (Wastewater Management Plan), WMP update or WQM plan amendment shall include additional measures as specified in an adopted TMDL or watershed restoration plan". Furthermore, N.J.A.C. 7:15-6.4 (b)5.iv specifies the inclusion of a implementation plan as a component of TMDL reports, but does not define the relationship between TMDLs and WMPs, or the WMP's role in identifying treatment plant strategies for meeting TMDL requirements. Clarification and guidance is needed as to how the Raritan TMDL requirements relative to the affected wastewater treatment facilities located in Somerset County should be addressed in the county-wide Wastewater Management Plan, which is currently underway by the Somerset County Planning Board. (C)

Response to Comment 23: The county-wide WMP should acknowledge and reference the TMDL. If any of the WWTPs receiving a WLA through the TMDL is within the county-wide WMP and is proposing an expansion or if there are any new WWTPs with a surface water discharge located within the domain of the TMDL, the WMP would need to acknowledge that the new or expanded WWTP would need to comport with the TMDL to be a viable wastewater management option in the WMP.

24. Comment: Recognizing the implementation of the New Jersey Fertilizer Law (New Jersey Act, P.L. 2010, c. 112 (C.58:10A-64) and its direct effect on nonpoint phosphorus loadings, there needs to be continued monitoring of these stream segments to assess the effects and determine corrections due to the implementation of this law. The next biennial water quality

assessment is expected to measure these improvements and it is appropriate that these results be considered in the modeling and analyses associated with establishing future permit limits. (C)

Response to Comment 24: Implementation of the Fertilizer Law is one of the measures expected to help achieve the load reduction assigned to nonpoint sources. The magnitude, timing and consistency of the water quality benefit that will be achieved through this measure is not known. WWTP reductions are critical to achieving water quality goals, especially during the critical conditions when flows are low and NPS are minimal. Therefore, it is not anticipated that successes achieved through the Fertilizer Law would translate to relaxed reductions for WWTPs. Progress toward meeting SWQS will be measured through the ambient monitoring program and, following a reasonable period to allow for implementation of regulatory and non-regulatory measures to reduce pollutant loads, the need to revise the implementation plan through an adaptive management response will be assessed.

25. Comment: The establishment of the Raritan TMDL will set limits for specific pollutants of concern (phosphorus including associated oxygen and pH effects, ammonia and total suspended solids) associated with nonpoint sources. However, there is currently no specific procedures described in the TMDL as to how these corrective efforts will be accomplished other than a general discussion regarding the predominantly voluntary use of Green Infrastructure, the AmeriCorps New Jersey Watershed Ambassadors Program, various

agricultural programs, existing regional and local partnership initiatives and current implementation projects. Other than the adoption of local stormwater management plans and ordinances, State Agricultural Development Committee's (SADC) Farmland Preservation "Conservation Plan" requirements, and implementation of New Jersey Fertilizer Law, these initiatives are voluntary, and their effectiveness has been limited. Consideration should be given to integrating water quality BMPs and other strategies as requirements in the update of the State's Stormwater Management Rules in order to successfully accomplish the TMDL goals in the Raritan Basin. (C)

Response to Comment 25: The Department has defined a host of implementation strategies, both regulatory and non-regulatory, as well as, the technical and financial assistance available to achieve the water quality objectives of the TMDL. To address uncertainty associated with the TMDL calculation and the effectiveness of the implementation responses, a Margin of Safety is included in the TMDL calculation. Further, should effectiveness monitoring post-implementation indicate that water quality objective are not being met, modification of the implementation strategies can be pursued. The Department is reasonably assured that success is attainable through a concerted effort to manage sources of relevant pollutants, as evidenced by success stories in other watersheds where water quality has been improved and/or water quality standards attained. Published success stories can be accessed at http://water.epa.gov/polwaste/nps/success319/.

The Department is also engaged in an effort to improve the effectiveness of the Municipal Separate Stormwater Sewer System (MS4) NJPDES permit program. With improved effectiveness, the Department anticipates that water quality improvements will be garnered through the MS4 permit. The effort includes methods to better identify and direct resources to areas most in need of improvement; to provide better outreach and education; and to improve guidance and regulatory structure. The Department has presented these efforts at a number of conferences and outreach sessions during 2014 (select presentations can be found at the bottom of www.nj.gov/dep/dwq/msrp_home.htm). Specifically, these efforts include:

- Revisions to the MS4 Tier A Annual Report and addition of Supplemental Questions;
- Development of a Comprehensive Municipal Stormwater Program Review ("Audit");
- Updated Stormwater Best Management Practices Chapters (www.njstormwater.org/bmp_manual2.htm);
- Improved education and outreach materials; and
- Promotion of Green Infrastructure (www.nj.gov/dep/gi/index.html)

26. Comment: The proposed limitation is onerous and will cause excessive expense to Hightstown Borough. The levels of phosphorus are unclear and have been based on only two studies of which the conclusions are not consistent. Adoption of the TMDL for phosphorus should not occur at this time and should be delayed until additional studies provide clear and consistent information. (D)

Response to Comment 26: The commenter does not identify the studies referred to in the comment, so no response can be made in that regard. Nevertheless, it should be noted that the critical location and water quality driver for the reductions assigned to the Hightstown Borough WWTP is Carnegie Lake, which violates water quality criteria. At this water quality endpoint, a natural condition criterion was determined to be appropriate and superseded the more stringent numeric criterion. The reductions allocated to the various point sources and nonpoint sources in the drainage area are necessary and appropriate to achieve the target corresponding to the natural condition in Carnegie Lake. It has not been established that all of the narrative nutrient criteria are met in the Upper Millstone River, which is the receiving water for the Hightstown Borough WWTP and conveys flow to Carnegie Lake. There was a study of the Upper Millstone River with respect to the response indicators established in the Technical Manual for Phosphorus Evaluations N.J.A.C. 7:9B-1.14(c) for NJPDES Discharge to Surface Water Permits (http://www.nj.gov/dep/dwq/techmans/phostcml.pdf). However, this protocol does not address waterbodies that are dominated by rooted macrophytes, as the Upper Millstone is in many locations. The narrative SWQS state that: Except as due to natural conditions, nutrients shall not be allowed in concentrations that render the waters unsuitable for the existing or designated uses due to objectionable algal densities, nuisance aquatic vegetation, diurnal fluctuations in dissolved oxygen or pH indicative of excessive photosynthetic activity, detrimental changes to the composition of aquatic ecosystems, or other indicators of use impairment caused by nutrients. To date, no translator has been established to determine what constitutes "nuisance aquatic vegetation."

The SWQS RTC at http://www.nj.gov/dep/rules/adoptions/adopt_110118a.pdf notes the following:

Using a numeric total phosphorus criterion along with the narrative nutrient criterion will allow the Department to address situations where a waterbody meets the applicable numeric phosphorus criterion, but still exhibits nutrient related problems, as well as situations where phosphorus concentration in a waterbody is above the applicable numeric phosphorus criterion, but does not actually exhibit any nutrient related problems.

The assessment method developed and incorporated in the 2012 Integrated Water Quality Assessment Methods Document http://www.state.nj.us/dep/wms/bears/assessment.htm enables the Department to evaluate site-specific responses to nutrients and identify waters where nutrients cause undesirable responses including waters where the phosphorus levels do not exceed the numeric criteria. The Department recognized that the data needed to make this type of assessment could be limited and therefore, will continue to use the numeric phosphorus criterion to evaluate whether water quality-based effluent limits (WQBEL) for NJPDES permits are necessary until the Department has data to conclude that the narrative nutrient criterion is met.

The narrative nutrient policies prohibit nutrient concentrations in freshwaters that cause objectionable algal densities, nuisance aquatic vegetation, or otherwise render waters unsuitable for designated uses.

As part of its Nutrient Criteria Enhancement Plan http://www.state.nj.us/dep/wms/bears/support_docs.htm, the Department is seeking to establish and/or refine numeric criteria or establish translators for the narrative nutrient criteria. In the meantime, the nutrient reductions called for in the TMDL can be viewed as proactively addressing the abundant rooted macrophyte growth in the Upper Millstone River while performing the essential function of addressing water quality impairment in Carnegie Lake. This approach is also reflected in the Technical Manual wherein it is stated: "…regardless of the status or results of any optional studies undertaken in accordance with this guidance, if the Department in a future action adopts a TMDL for total phosphorus for the receiving water of a subject discharger, the Department will develop and propose a draft NJPDES permit consistent with any wasteload allocation derived from the TMDL." The Technical Manual also states, "Should the spatial extent of the segment include or terminate at a downstream lake or impoundment, additional sampling must be conducted at the point where the tributary reaches the lake or impoundment. Phosphorus levels in excess of 0.05 mg/L at this point will prevent the use of this phosphorus evaluation manual for any additional assessments (as the SWQS do not allow for demonstrations for lakes) and the WQBEL is applicable."

Should Hightstown Borough wish to make a demonstration that the required reduction is burdensome, there are procedures and criteria in place to evaluate that assertion, see Response to Comments 18 and 19.

27. Comment: Princeton Plasma Physics Laboratory has the lowest TMDL defined TP concentration found in the Upper Millstone River Watershed Model Area. Why would three other larger wastewater treatment plants (WWTPs) located in the watershed have higher TP concentrations? (E)

Response to Comment 27: The Kleinfelder/Omni Phase II Final Report (Kleinfelder/Omni, 2013, Volume 1 of 3, p. 177) states that meeting the natural conditions in Gordon Pond required a more restrictive reduction than meeting the natural conditions modeled in Carnegie Lake. PPPL discharges to Gordon Pond and as a result received a more stringent limit applicable to PPPL compared to other dischargers in Upper Millstone River watershed that have WLAs designed to meet water quality criteria in Carnegie Lake. Although shown in TMDL Report Figure 9, information on meeting natural conditions in Gordon Pond has also been included in section 3.1 (page 13) and section 5.0 (Table 12 footnote) for added clarity.

28. Comment: Examination of the information from Attachment 1 to the Executive Summary ("Summary of TMDL Condition") indicates the use of a "permitted flow" value (0.639 mgd) that is well in excess of both Princeton Plasma Physics Laboratory's (PPPL) average daily flow (0.196 MGD) and the flow values used by the Department to calculate concentration limits for our current permit (0.229 MGD). The result is that the TMDL model produces a lower total phosphorous concentration limit to compensate for the high flow. (E)

Response to Comment 28: The Department acknowledges the commenter's analysis as accurate. The TMDL modeled the PPPL at the facility's permitted flow (0.637 mgd) based on information available during model development. Permitted flow is used in TMDL development to assure water quality is protected under full permitted flows and pollutant load conditions for each WWTP. At the permitted flow, a lower concentration would be needed to achieve the load allowed by the WLA. While TMDLs are required by law to establish daily load limits, EPA allows the expression of the WLA as an effluent limit as other than a daily limit, provided the water quality objective of the TMDL is met. Where the water quality driver is solely a downstream lake or pond, the relevant time frame for the WLA can be expressed as an annual load limit. At the lower existing flow, a higher concentration of phosphorus would meet the annual load limit. In this instance, the WLA was set to meet the applicable water quality criteria for Gordon Pond. It would be consistent with the TMDL to express the WLA for this facility as an annual load only limit. As such, at any time, a permittee may request that the TMDL-based effluent limitations imposed in their NJPDES permit be expressed directly as the TMDL defined annual/seasonal WLA load identified in Table 12 of this TMDL document. This is supported in Kleinfelder/Omni Report on page 177 and page O-1 of Kleinfelder Report Appendix O (Kleinfelder, 2013).

29. Comment: The report appears to underestimate the contribution of naturally-occurring phosphate in the ground water, which may contribute to background surface water concentrations. Ground water contributions are modeled as surface water inputs to small un-modeled streams and ground water contributions appear to be a portion of nonpoint source

background ("NPS Background") contributions to surface water. Further, NPS Background appears to represent only a small portion of overall phosphorous loading (*e.g.*, Figure 22). Yet, in other areas of the report, it appears that observed phosphorous concentrations can be wholly attributable to natural conditions:

"In addition, modeling simulations demonstrate that streams in the Upper Millstone River are not sensitive to phosphorous source reductions; productivity, as reflected by diurnal DO swings, does not change with reductions to point and nonpoint sources of phosphorous. This reflects the fact that natural levels of phosphorous are sufficient to drive the levels of productivity observed in the streams." (Kleinfelder/Omni, 2013, Volume 1 of 3, p. 170)

The contribution of ground water phosphorous to surface water bodies was the subject of a recent study by the U.S. Geological Survey (Denver, et. al., 2010). That study examined ground water/surface water interactions and hydro-geochemical processes in crystalline, siliciclastic (i.e. clastic non-carbonate sedimentary rocks that are almost exclusively silica-bearing) and carbonate bedrock settings in a broad area of the Eastern United States, including the Raritan River Basin. It identified locations where ground water was not impacted by human activities and yet had phosphate concentrations in ground water that were higher than adjacent surface waters. Among other findings, Denver, *et. al.* concluded in such settings that:

"As groundwater is an important source of water to streams and provides more than 50 percent of annual flow in most settings, phosphorous dissolved in groundwater is likely to contribute to the nutrient load in streams," and, "The reported concentrations of

phosphorous in streams during base flow were frequently higher than the eco-region nutrient criteria..." (p. 32).

"For networks in the siliciclastic setting, the concentrations of phosphate in the surface water commonly were less than those in the associated groundwater, indicating that groundwater could be a principal source of dissolved phosphate in surface water." (p. 29).

The study authors further examined and modeled various naturally-occurring geochemical interactions that can both contribute and sequester phosphate in the hydrogeological cycle, and concluded that, "An understanding of the potential for the release of phosphorous from natural sources and the processes affecting its transport would be needed for resource managers to determine whether phosphorous loading from groundwater is sufficiently large to warrant additional guidelines for in-stream phosphorous criteria," (p. 34). (E)

30. Comment: In the case of PPPL's permitted surface water outfall, ground water represents approximately 25% of the average daily flow. PPPL's environmental monitoring and surveillance program has documented that ground water, potable water provided by the local water company and surface water upstream of the outfall frequently show phosphorous concentrations in excess of both the proposed permit limit and the proposed surface water quality goal. PPPL supports the Department's effort to control nutrients in order to protect and restore surface water quality in the state. We encourage the Department to incorporate all available scientific research in the development of basin-wide TMDL regulatory programs, while also recognizing the significant role that natural processes play in this complex ecological system. As expressed in the NJSWQS (N.J.A.C. 7:9B-1.14(d)4i), "Except as

due to natural conditions, nutrients shall not be allowed in concentrations that render the waters unsuitable for existing or designated uses...". Consistent with this narrative standard, a regulated entity should not be expected to mitigate naturally occurring nutrients in the hydrologic cycle. (E)

Response to Comments 29 and 30: The ground water contribution was counted through the base flow condition values entered into the Raritan River watershed model simulation. The data collected under the baseflow condition during the Phase I of this project indicated a higher base flow concentration from Upper Millstone watershed than was found in other watersheds. In response, a higher phosphorus BFC value was assigned to Upper Millstone as shown in Table 30 of the Kleinfelder/Omni Phase II Final Report (Kleinfelder/Omni, 2013, Volume 1 of 3, p. 134) during the model simulation. The higher natural background also played a role in choosing the appropriate water quality target. In this case, it was found that the applicable lake numeric criterion will not be met even under the natural condition. As a result, meeting the water quality of Gordon Pond under the natural condition was set as the water quality driver to calculate the TMDL and WLAs. Therefore, this unique subwatershed characteristic was appropriately accounted for in the TMDL calculation that resulted in a WLA for the PPPL WWTP.

31. Comment: The Department needs to explain how the TMDL Condition values for the NJPDES facilities listed in Table 12 will be converted and given as permit limits. Please explain how permit limits will be imposed in future NJPDES permit renewals? What factor

will be applied to the Long Term Average (LTA) concentrations to calculate limits in future permit renewals? (C),(F)

Response to Comment 31: According to N.J.A.C. 7:15-3.1, permitted effluent concentrations and loads must be consistent with a TMDL defined WLA. The Raritan TMDL establishes WLAs, but does not set forth the effluent limits that will be calculated for each facility. The multiple dischargers affected by this TMDL are not uniform as to the classification of the receiving water, water quality drivers, existing effective effluent limits and DMR data that could inform the applicable coefficient of variation to be used to calculate an AML effluent limit from a WLA. This variability necessitates establishing effluent limits on a facility-by-facility basis. The Department plans to do this upon permit renewal. The TMDL does outline the factors that will be taken into consideration and the basic procedure to be used when establishing the facility-specific effluent limits (TMDL report page 45). Additional clarification has been provided through additional footnotes to TMDL Report Table 12 (p. 42-43) to help inform the affected permittees and the public. Please also refer to Response to Comment 21 for additional information regarding setting effluent limits so as to achieving TMDL WLAs on a seasonal/annual basis in order to ensure that the water quality objective is achieved.

32. Comment: It appears that some of the TMDL's will result in a higher permit limit than in existing permits. Please confirm that the limit as determined by the TMDL study will apply. (F)

Response to Comment 32: The commenter is correct in this observation. USEPA's guidance on Section 402(o) of the Clean Water Act and Chapter 7 of the NPDES Permit Writers' Manual explains that the regulatory authority must assure that the existing surface water quality standards and designated uses are protected when establishing effluent limits. Provided this is the case, an effluent limit derived from a WLA set forth in a TMDL may be less stringent than an effective permit limit for a WWTP. The WLAs for the Raritan Basin were developed based on a robust data set and a peer reviewed model and effluent limits that are consistent with these WLAs can be relied upon to meet this SWQS at the defined critical locations.

It should be noted that, in order to meet SWQS at certain critical locations, load reductions were required for dischargers upstream of the applicable critical location, even if the assessment unit in which the discharger was located was not assessed as impaired. There are 4 facilities for which the receiving waters are either designated as Category 1 or are upstream of a Category 1 stream: Day's Inn - Roxbury - Ledgewood (NJ0028304), Mt, Olive Twp. - Clover Hill STP (NJ0021954), Hercules Kenvil Works Facility (NJ0000876), and the Mendham Boro (NJ0021334) facility. Category 1 waters are afforded special protection under the SWQS, at N.J.A.C. 7:9B 1.5(d) which states, "Category One Waters shall be protected from any measurable changes (including calculable or predicted changes) to the existing water quality. Water quality characteristics that are generally worse than the water quality criteria, except as due to natural conditions, shall be improved to maintain or provide for the designated

uses where this can be accomplished without adverse impacts on organisms, communities, or ecosystems of concern." In these waters, the existing better-than-criterion water quality must be protected from pollutant dischargers that would cause a measureable change in the water quality. The requirements established in the TMDL to meet a water quality endpoint at a downstream critical location would not supersede the more stringent Category 1 requirements that apply to the immediate receiving waters. As a result, the subject 4 dischargers, which have effective effluent limits that are more stringent than would be required to meet downstream water quality endpoints, would retain the existing effective effluent limits. A clarifying footnote has been added to Table 12 (page 43) and additional language was added to section 7.1 of the TMDL document.

OTHER COMMENTS:

33. Comment: The proposal "defers" action on a TP TMDL in the Lower Millstone River which would address five facilities that discharge treated wastewater and fails to provide information on current actions, plans or funding that will be made available to address this "deferred" issue. (G)

Response to Comment 33: The Department recognizes that there are pollutant impairments in the deferred area. Although a specific timeframe for TMDL development has not been defined in this report, the 303(d) List contains the priority ranking of each assessment

unit/pollutant combination ("high", "medium", or "low") for TMDL development. A medium priority ranking has been assigned in addressing these impairments.

34. Comment: The proposal does not include a detailed plan for securing the very substantial reductions in phosphorous loading from "non-point" sources called for in the TMDL. Past actions can't be counted towards pollution reduction goals without any attempt to quantify their impact. The proposed reductions in nutrient loading from non-point sources should be addressed in the proposal by including estimated reductions from these previously enacted efforts. For example, what is the estimated reduction in non-point phosphorous loading that will occur from the full implementation of New Jersey's 2011 Fertilizer Law? (G)

Response to Comment 34: It is not possible to account for the quantitative load reductions from the various implementation efforts that have occurred since the TMDL development began because there is no requirement for reporting to the Department all of the load reduction activities that may have occurred. These efforts do contribute to the achieving the required load reductions calculated between the existing condition and the TMDL condition presented in TMDL report Table 5 through Table 11, and progress toward attaining SWQS will be measured through ambient monitoring networks. The Department is aware of a subset of these pollutant load reduction actions, either through funding the work or based on information provided by partners, and has identified them in the Implementation Plan. Where 319(h) funding was used to implement an action, the anticipated pollutant load reduction was estimated and entered into USEPA's Grants Reporting and Tracking System

(GRTS). This system is the primary tool for management and oversight of the EPA's Nonpoint Source Pollution Control Program. GRTS pulls grant information from EPA's centralized grants and financial databases and allows grant recipients to enter detailed information on the individual projects or activities funded under each grant. The system can be accessed online at http://iaspub.epa.gov/apex/grts/f?p=110:199:: When the webpage opens, one would first click on "map viewer" on the left of the webpage. Second, after the map is displayed, one can zoom to the area of interest and the nonpoint source (NPS) projects by watershed will load and display on the map.

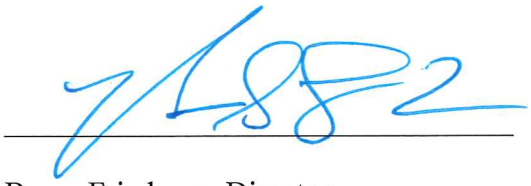
Keeping a tally of estimated load reductions achieved is helpful, but ultimately, the appropriate means to measure progress toward meeting the objectives of the TMDL is through ongoing monitoring and assessment processes. This is because load reduction estimates associated with implementing various BMPs are only targets and the real objective is to attain the water quality standards and support the designated uses.

35. Comment: The proposal suggests that additional measures may be taken in the future to reduce nonpoint source pollution, including more frequent street sweeping and inlet cleaning and retrofitting of stormwater management facilities to include nutrient removal. There is no process…described (to) ensure that such actions are taken. The Department needs to supplement its existing stormwater regulatory program to ensure that such strategies are implemented and this should be outlined in the TMDL. (G)

Response to Comment 35: As previously stated, water quality improvements will be assessed after the implementation measures described in the TMDL have been substantially effectuated. At that time, the Department will determine if the measures have resulted in attainment of SWQS or if enhanced measures, such as additional measures that would be set forth in MS4 permits, are required. As described in Response to Comment 25, the Department is also engaged in an effort to improve the effectiveness of the Municipal Separate Stormwater Sewer System (MS4) NJPDES permit program.

36. Comment: The Department must make a firm commitment to fund many more pollution reduction projects if the proposals substantial goals for non-point source pollution loading are to be met. Without substantial funding, we fear that the goals of the proposal will go largely unmet. (G)

Response to Comment 36: The Department uses all funds available to implement TMDLs and improve water quality. The Department recognizes there are limited resources and that implementation will take some time, however, it is committed to protecting and restoring water quality. In the fiscal years 2014, 2015 and 2016, implementation of projects that would advance the objectives of the Raritan TMDL study was an identified priority of the Request for Proposals for 319(h) pass through grant funds.



Bruce Friedman, Director

Division of Water Monitoring and Standards

Department of Environmental Protection

5/24/16

Date