UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
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August 9, 2016

Michael Kuhns, Director
Bureau of Water Quality
Maine Department of Environmental Protection
#17 State House Station
Augusta, Maine 04333-0017

SUBJECT: **Notification of Approval of the Maine Statewide TMDL for Nonpoint Source (NPS) Pollution report**

Dear Mr. Kuhns:

Thank you for submitting the final *Maine Statewide Total Maximum Daily Load (TMDL) for Nonpoint Source (NPS) Pollution* report. The purpose of these TMDLs for sediment, phosphorus, and nitrogen is to address the impaired aquatic life use in twenty-one freshwater stream segments located in rural/suburban areas of towns located in several different watershed drainage areas across Maine, as listed and identified in the attached copy of Appendix 1 of the TMDL report.

The U.S. Environmental Protection Agency (EPA) hereby approves Maine's July 5, 2016 submittal of these NPS TMDLs. EPA has determined that these TMDLs meet the requirements of §303(d) of the Clean Water Act (CWA) and of EPA's implementing regulations (40 CFR Part 130). Attached is a copy of our approval documentation.

We believe the information, maps, and other locational references provided in Maine's Statewide NPS TMDL document, with site-specific appendices for each impaired stream segment, will continue to educate, motivate, and assist stakeholders in addressing nonpoint source water quality impairments at the local level. My staff and I look forward to continued cooperation with the ME DEP in exercising our shared responsibility of implementing the requirements under Section 303(d) of the CWA.

Sincerely,

-s-

Ken Moraff, Director
Office of Ecosystem Protection

cc (electronic):
Don Witherill, ME DEP
Susanne Meidel, ME DEP

08-09-2016

EPA NEW ENGLAND'S TMDL REVIEW

TMDL: **Maine Statewide TMDL for Nonpoint Source Pollution**, multiple counties, Maine
HUC: multiple; ME ID#: 21 different rural/suburban stream segments.
2012 303(d) listings: aquatic life use impairment.

STATUS: Final

IMPAIRMENT/POLLUTANT: Aquatic life use impairment measured by Classes A and B, aquatic life criteria (low dissolved oxygen, biological assessments using benthic macroinvertebrates and/or algae); primary sources are rural/suburban nonpoint source runoff and nutrient enrichment from a number of diffuse anthropogenic sources, including agricultural runoff. Area loading based TMDLs are established for **sediment** (TSS) **phosphorus** (TP) and **nitrogen** (TN).

BACKGROUND: The Maine Department of Environmental Protection (ME DEP) submitted a draft TMDL for public review on December 22, 2015. A public comment period was scheduled until January 29, 2016, and a public comment meeting was scheduled on January 19, 2016, in Augusta, ME. ME DEP submitted to EPA Region 1 the final *Maine Stateside TMDL for Nonpoint Source (NPS) Pollution report* with a transmittal letter dated July 5, 2016. All of EPA's comments on the public review draft were taken into account in the final submission. In addition to the TMDL itself, the submittal included, either directly or by reference, the following documents:

- *Table of Estimated Pollutant Loads TMDL Allocations)*, Appendix 1, TMDL report.
- *Modeling Methodology & Attainment Stream Details to Support TMDL Development,* Appendix 2, TMDL report.
- *Agricultural Best Management Practices & Environmental Regulations*, Appendix 3, TMDL report.
- *Overlap between NPS TMDL Watersheds and Regulated MS4 Areas,* Appendix 4, TMDL report.
- *Public Review Comments and Responses,* Appendix 5, TMDL report.
- *Watershed-specific Summaries,* Appendix 6-1 – 6-21, TMDL report.
- ME DEP Rule, Chapter 579, *Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams*. May 2003; Table 3, page 14 TMDL report.

http://www.maine.gov/dep/water/monitoring/biomonitoring/material.html

The following review explains how the TMDL submission meets the statutory and regulatory requirements of TMDLs in accordance with § 303(d) of the Clean Water Act and EPA's implementing regulations in 40 CFR Part 130.

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REVIEW ELEMENTS OF TMDLs

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. § 130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.

1. Description of Waterbody, Pollutant of Concern, Pollutant Sources and Priority Ranking

The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyll a and phosphorus loadings for excess algae.

A. Description of Waterbody, Priority Ranking, and Background Information

A total of 21 impaired segments listed in Maine's approved 2012 303(d) list as high priorities for TMDL development are characterized as small, rural/suburban streams, and are located within several different watersheds from southern to central Maine, as shown in Figure 1 of the TMDL report. Table 1 (pp. 7-8, TMDL) lists each of the 21 impaired stream segments alphabetically by name within each of four large watershed groupings, and includes each waterbody's name, location, assessment unit identifier, receiving waterbody, listing cause(s), segment size, TMDL priority ranking, and stream classification, which determines the applicable water quality criteria. Table 1 also indicates all the segments were ranked as high priority for TMDL development. Site-specific maps and data are provided for each impaired stream segment in appendices 6-1 to 6-21.

B. Pollutants of Concern, and Pollutant Sources

The document describes the primary pollutants of concern for the impaired streams: **total phosphorus, total nitrogen, sediment**. For watershed modeling purposes, all three pollutants are used as primary contributors to and surrogates for the nutrient enrichment and/or DO impairment assessed in these 21 streams. Maine DEP explains that disturbed and bare soil contributes sediment, phosphorus and nitrogen when washed into streams. Elevated nutrient loading and sediment accumulation contribute to excess algal growth, which consumes oxygen during respiration and depresses dissolved oxygen levels. Excess sediment contribution to streams is also a significant contributor to aquatic habitat degradation (p. 10 TMDL report).

The waterbodies addressed in Maine's NPS TMDL document are primarily impaired by **nonpoint source pollution** resulting from human activities within the stream watersheds. NPS

pollution results from storm events creating overland runoff of pollutants from roads and development in rural/suburban areas, and "cannot be traced back to a specific source; rather it often comes from a number of diffuse sources within a watershed" (p. 4, TMDL report). The report also explains the role of Maine's NPS Management Program that works with local stakeholders toward protecting and restoring surface and groundwater impaired by pollutants associated with nonpoint source runoff.

Maine's December 2015 public review draft TMDL report included 9 additional impaired streams located in towns with portions of some watershed areas subject to Maine's MS4 general permit. In response to public comments about the implications of the NPS TMDL for MS4 permitees, the overlap between NPS TMDL watersheds and municipalities with designated urbanized areas under Maine's Stormwater Program (and subject to coverage under Maine's MS4 general permit) is described and presented in maps in Appendix 4 of the TMDL report. Those 9 impaired streams were removed from the final 2016 TMDL submittal. ME DEP states in the final TMDL document that the Department intends to include those impaired waters in a future amendment of the TMDL, pending further internal discussion, and outreach to affected municipalities.

Assessment: EPA Region 1 concludes that the final TMDL document meets the requirements for describing the TMDL waterbody segments, pollutants of concern, identifying and characterizing sources of impairment, and priority ranking.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.

The ME Statewide NPS TMDL report describes the applicable water quality standards, designated uses, criteria, and antidegradation policy (see pp. 11-13 TMDL report). Maine explains that the water quality standards relevant to this statewide TMDL report include the designated use of "habitat for fish and aquatic life" (aquatic life support) for each of the classification levels, and the relevant water quality criteria assigned to each water class. According to Maine's water classification program, freshwater rivers and streams are classified as Class AA, A, B, or C, and offer different levels of protection (see Table 1 pp.7-8 TMDL report). In order for a waterbody to attain its classification, all applicable surface water quality standards must be met. Each classification of freshwater rivers and streams includes designated uses (Table 2 p. 12 TMDL report); narrative and/or numeric water quality criteria for dissolved oxygen (DO), habitat, and aquatic life (all applicable to the NPS TMDLs) (Table 3 p. 13 TMDL report); and antidegradation provisions (designed to protect and maintain all water uses and water quality). "The classes providing the most protection and least risk of impairment have the most stringent water quality criteria" (p. 12,

TMDL report). Water quality classification and water quality standards of all surface waters of the State of Maine have been established by the Maine Legislature at Title 38 MRSA 464-468.

The applicable narrative and numeric water quality standards criteria for this TMDL submittal include dissolved oxygen numeric criteria, and narrative and numeric biological criteria for rivers and streams (see p. 13 TMDL report).[1] It is important to note that the numeric dissolved oxygen criteria are the same for Class A and B waters (7 ppm; 75% saturation) (see. p. 13 TMDL report). Of the 21 impaired streams submitted in this TMDL report, 2 Class A and 15 Class B waters are impaired for DO alone (and therefore subject to the same DO criteria); 1 Class B water is impaired for DO and biological indicators; 2 Class B waters are impaired for benthic macroinvertebrates and periphyton (algae); 1 Class B water is impaired for periphyton (algae) alone.

As mentioned above, Maine DEP uses three pollutants of concern (phosphorus, nitrogen, and sediments) as surrogate measures of nonpoint source pollutant impacts resulting in violation of the State's water quality criteria for streams. Since Maine does not have numeric water quality standards for the surrogate pollutants, numeric water quality targets for phosphorus, nitrogen, and sediments are established by modeling the runoff pollutant loads from several appropriate attainment watersheds in the same geographical regions as the impaired streams. Maine explains that, "Both impaired and attainment watersheds [have] similar overall characteristics with the same range of land uses. "Specifically, both groups [have] a meaningfully high level of agriculture, and little to no urbanized areas. From a larger list of attainment streams, a set of five representative attainment watersheds were selected from across the state based on similar watershed size and land use as the impaired streams, along with the quantity and quality of assessment data." (see Table 4, p. 14 TMDL report, and pp. 11-26 Appendix 2). All five of the chosen attainment streams are Class B waters.

Assessment: EPA New England concludes that ME DEP has properly presented its water quality standards, and has made a reasonable interpretation of the narrative water quality criteria in the standards when setting the numeric water quality targets by using streams in attainment with the appropriate water quality standards, and with similar overall characteristics for reference watersheds. EPA has reviewed the modeling report in Appendix 2 and believes that ME DEP's selection of reference watersheds is based on reasonable and appropriate technical criteria.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant.

[1] Maine's freshwater biocriteria were initially developed through the use of macroinvertebrate sampling and associated community structure modeling. The biocriteria provide a quantitative methodology for interpreting Maine's narrative biological criteria and aquatic life uses for rivers and streams, and for making decisions about classification attainment. A waterbody is determined to be in attainment in accordance with Chapter 579.4. Maine's biocriteria are based on 20 years of data from 768 river and stream and 126 wetland sampling locations, and over 1300 individual sampling events. Required sampling methods are referenced in Chapter 579.2 and included in the document entitled, *Methods for Biological Sampling and Analysis of Maine's Rivers and Streams* (DEP LW0387-B2002). Subsequent work by ME DEP has also resulted in the use of a Periphyton (Aufwuchs) Indicator for bioassessments in nutrient-stressed streams.

EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 C.F.R. § 130.2(f)). The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. § 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.

In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.

ME DEP uses a comparative attainment approach to establish the pollutant loading capacities for nutrients and sediment by determining the loading capacities in appropriate attainment streams, as explained above (see Table 4, p. 14 TMDL report). The following loading capacities for nutrients and sediment applicable to the impaired segments are set at numeric target levels using the annual unit area loads of each pollutant, averaged among five appropriate attainment streams located in different watershed areas of Maine: **total phosphorus** (0.24 kg/ha/year), **total nitrogen** (5.18 kg/ha/year) and **sediment** (0.03 1,000 kg/ha/year). "The difference between pollutant loading in impaired and attainment watersheds [represents] the percent reduction needed in each impaired watershed" (see p. 11 Appendix 2).

As indicated by the units above for each of these pollutant loads, the loading capacities are expressed as **annual unit area loads,** rather than daily loads, in order to "normalize the spatial and temporal variation associated with instream nonpoint source pollutant concentrations" (see Table 4, p. 14, and pages 14-15 TMDL report.). These loading capacities are set to protect water quality and support uses during critical conditions, which are defined as environmental conditions that induce a stress response in aquatic life (p. 16, TMDL report). These stressful conditions may occur throughout the year, at various flows, and depend on the biological requirements of the life stage of resident aquatic organisms. Complexities of critical conditions in flowing water impaired by NPS runoff are a major consideration in expressing the TMDL in terms of **annual loads**. The TMDL loads can also expressed in terms of **daily maximum loads** (see Table 4, 1st footnote, p. 14 TMDL report).

In such a comparative attainment approach, identical modeling procedures must be applied to all watersheds in the analyses (see Appendix 2 TMDL report). MapShed nutrient loading model (first developed as the Generalized Watershed Loading Function (GWLF) model) is used to estimate pollutant loadings of phosphorus, nitrogen, and sediment associated with each of the five unimpaired reference streams, and with the impaired portions of the streams addressed in this TMDL report. The difference between the reference watershed average and each impaired stream is the pollutant load reduction needed to achieve water quality criteria (established to

protect aquatic life use) for each of the nonpoint source pollutants of concern (see documentation in Appendix 1, TMDL report).

The GWLF model is an established midrange modeling tool that uses hydrology, land cover, soils, topography, weather, pollutant discharges, and other critical environmental characteristics in order to model sediment and nutrient (TN and TP) transport within a watershed, and to compute flow and pollutant loads. In this case, GWLF was used as the core watershed simulation model, and Northeast AVGWLF is used to model the watershed land uses at a screening level of model evaluation for planning level estimates rather than exact prediction of loads entering streams. (Northeast AVGWLF is the GWLF model with an ArcView geographic information systems (GIS) interface; see Appendix 2, TMDL report.)

All model simulations are conducted over a 10-15-year period (depending on weather data availability) in order to capture sufficient hydrologic and weather conditions to account for typical variations in nutrient loading conditions. These simulations include those for the attainment watersheds and the 21 impaired stream segments listed in Table 1 (pp. 7-8, TMDL report). ME DEP explains the assumptions, strength and weaknesses of the analytical process involving the GWLF model and comparative reference stream approach to evaluating loading capacities (pp. 15-16, and Appendix 2, TMDL report). These analytical methods are widely recognized as appropriate for NPS-impaired stream TMDL assessment.

Assessment: Since nonpoint source runoff occurs throughout the year, with different environmental effects, at both low and high flows, critical conditions for aquatic life protection are not limited to particular flow conditions or time of year. EPA concludes that critical conditions are adequately accounted for by the range of aquatic life use impacts under varying critical conditions at different flows. EPA New England concludes that the loading capacities have been appropriately set at levels necessary to attain and maintain applicable water quality standards. The TMDLs are based on a reasonable and widely accepted approach for establishing the relationship between pollutant loading and water quality in nonpoint source-impaired watersheds.

TMDL Time Increment / Daily Loading

EPA's November 15, 2006 guidance entitled "Establishing TMDL 'Daily' Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No.05-5015, (April 25, 2006) and Implications for NPDES Permits," recommends that TMDL submittals express allocations in terms of daily time increments. In this case, the TMDLs' pollutant targets are expressed in terms of a daily increment, as well as in terms of an annual load. EPA New England concurs with expressing the TMDLs as annual loads based on the reasons provided by ME DEP (critical conditions occurring at various flows and pollutant loads throughout the year).

Climate Change

Although the issue of climate change was not raised during the public comment period for these NPS TMDLs, EPA recognizes that increasing atmospheric greenhouse gas concentrations are anticipated to drive climate change resulting in deviations in atmospheric temperature and

precipitation patterns from their historic norms in many areas (IPCC, 2007; Karl et al., 2009; USGCRP, 2009). These climate changes, in turn, will affect key parameters influencing water quality such as flow and water temperature, both of which affect protection of aquatic life use (the subject of this TMDL report).

Over 40,000 TMDLs have been developed for the nation's waters to determine the maximum pollutant loads allowable that would still permit attainment of water quality standards. Until recently, all were based upon historical water data, without consideration of the plausible range of future flow and water temperature profiles in a climate-change altered world.

National research at EPA and other parts of the Federal government, States, etc., is currently developing tools and projections for assessing the impacts of climate change on future water quality and, by extension, TMDLs. Multi-decadal projections of possible future climate conditions at local to regional scales are variable depending on the choice of general circulation model and economic growth assumptions used to drive the levels of greenhouse gas emissions upon which the models rely. In most locations, models agree that temperature will go up, though they vary on how much. Projected precipitation changes vary significantly by region, and in many locations models disagree on the direction of changes, especially in the northeastern United States. Climate models currently have limited skill in accurately projecting local to regional scale changes in frequency, intensity, and duration of precipitation events, though current observations and theory suggest these factors will change.

The ultimate goal of these TMDLs is achieving water quality consistent with Maine's current water quality standards and criteria [38 MRSA 38 §465]. Any substantial future increases in nonpoint source/stormwater flow and associated pollutants due to climate change in New England may require additional implementation efforts to achieve the ultimate TMDL goal of achieving Maine's water quality criteria. Implementation plan recommendations may need to be re-evaluated periodically and revised to account for such changes in runoff and water quality if future water quality assessments continue to document non-attainment of water quality standards.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 C.F.R. § 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. § 130.2(g)). Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.

If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.

ME DEP allocates each of the loading capacities for the 21 nonpoint source-impaired streams as the "load allocation", a single categorical (gross) allotment, to existing and future nonpoint sources and to natural background: **phosphorus** (0.24 kg/acre/year), **nitrogen** (5.18

kg/acre/year) and **sediment** (0.03 in terms of 1,000 kg/acre/year) (see Table 4 p. 14 TMDL report). Necessary load reductions for each impaired stream are provided in Appendix 1, TMDL report. Due to the limited and general nature of the available information in these watersheds, ME DEP explains that "it is not feasible to separate the loading contributions from non-point sources, non-regulated stormwater, and natural background" (p. 19, TMDL report). ME DEP also points out that future population growth needs to be assessed and addressed on a watershed basis to account for new development, in order to ensure future attainment of TMDL targets (p. 17, TMDL report).

Assessment: EPA New England concludes that the load allocations for total phosphorus, total nitrogen, and sediment are adequately specified in the TMDL report at levels necessary to attain and maintain water quality standards. The degrees of load reductions necessary to achieve the in-stream phosphorus, nitrogen, and sediment levels are based on estimates of current loadings, and the need to address future loadings is discussed.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

Although all 21 impaired stream segments included in the TMDL submittal at this time are in watersheds with no MS4 designated urbanized areas, the TMDL states that ME DEP expects to include, in future modifications to this TMDL, other NPS-impaired suburban waters located in regulated MS4 areas (p. 19 TMDL report). In this statewide TMDL for nonpoint source pollution, ME DEP states that, "For each impaired waterbody addressed by these TMDLs, LA (for background sources, nonpoint sources, and non-regulated stormwater) are given the same TP, TN, and TSS allocations as the WLAs (for MEPDES regulated sources) because the TMDLs are expressed in terms of annual unit area loads. (Nutrients are expressed in terms of kg/ha/year; sediment is expressed in terms of 1,000 kg/ha/year)" (p. 18, TMDL report). This TMDL approach is used because, unlike point source discharges with TMDLs expressed in lbs./day of pollutant applied at a maximum discharge flow volume, nonpoint source discharges and overland flow of stormwater (regulated or unregulated) is very difficult to quantify, and it makes more sense to apportion pollutant loads on an easily identifiable land area basis.

Since the allocations are areal-based, it is important to note that no portions of the 21 watersheds

addressed by the TMDL report at this time are designated as an urbanized area subject to coverage under Maine's general permit for municipal separate stormwater sewer systems (MS4s). However, stormwater associated with construction site activities affecting over one acre, located anywhere in the State of Maine, would be subject to the MEPDES stormwater permit program (Construction General Permit), although those activities are expected to be short term and infrequent.

Assessment: EPA New England concurs that the WLA component of the TMDLs is appropriately set equal to the LA component of the TMDLs because ME DEP's apportionment of pollutant loads are allocated on the same identifiable *land area* basis.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

The Maine Statewide NPS TMDLs include an implicit margin of safety (MOS) based on a conservative selection of numeric water quality targets, which were based on reference streams that attain appropriate water quality standards and criteria for aquatic life protection. There are also several conservative assumptions associated with the AVGWLF model, which provide a MOS to account for uncertainty, and ensure that water quality standards will be attained in the 21 streams identified in Appendix 1 (TMDL report). For example, the reference watersheds were assumed to be in attainment by a margin greater than zero (not at the border between attainment and impairment). "By setting the TMDL target equal to the reference watershed nutrient load, an implicit margin of safety is therefore in place" (see p.2 Appendix 2). In addition, the modeling process did not account for existing riparian buffers, existing agricultural BMPs, instream nutrient-attenuating and sediment-settling processes, all of which reduce the pollutant load that moves through the system.

Assessment: EPA New England concludes that adequate MOS is provided. EPA believes a significant implicit MOS is provided in the conservative modeling assumptions used to establish the numeric water quality targets.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)).

Seasonal variation for the impaired streams listed in Appendix 1 (TMDL report) is considered in the allowable annual loads of nutrients and sediment, which are set to be protective of macroinvertebrates and other aquatic life under the influence of seasonal fluctuations in environmental conditions such as flow, rainfall, and runoff. (p.17, TMDL report.) ME DEP

explains the various seasonal fluctuations in flow which influence the concentrations of nutrients and sediment, and how the TMDLs are protective of all seasons.

ME DEP also explains that the numeric targets are applicable year round because NPS pollution events that occur over the entire year contribute to the aquatic life impairments documented in the impaired streams, and that benefits realized from pollutant reductions in the watershed will occur in all seasons. (p. 17, TMDL report).

Assessment: EPA Region 1 concludes that seasonal variation has been adequately accounted for in the TMDL because the TMDL was developed to be protective year round. Seasonal fluctuations in flow, and varying contributions of nutrients and sediment from snow and rainfall runoff are taken into account. In addition, nutrient and sediment controls are expected to be in place through the year so that these controls will reduce pollution whenever sources are active.

8. Monitoring Plan

EPA's 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001), and EPA's 2006 guidance, Clarification Regarding "Phased" Total Maximum Daily Loads, recommend a monitoring plan when a TMDL is developed using the phased approach. The guidance indicates that a State may use the phased approach for situations where TMDLs need to be developed despite significant data uncertainty and where the State expects that the loading capacity and allocation scheme will be revised in the near future. EPA's guidance provides that a TMDL developed under the phased approach should include, in addition to the other TMDL elements, a monitoring plan that describes the additional data to be collected, and a scheduled timeframe for revision of the TMDL.

ME DEP explains that future, more detailed assessments of individual nonpoint source pollution sites will be needed to develop site-specific best management practices (BMPs), and recommends stream monitoring be conducted as part of pre- and post BMP-application assessments. As restoration plans proceed, ME DEP will check on progress towards attainment of Maine's water quality standards with both water chemistry (e.g., dissolved oxygen) and biological monitoring evaluations (page 19, TMDL report). Future monitoring will be conducted according to the Department's rotating basin sampling schedule.

Assessment: EPA Region 1 concludes that the anticipated monitoring by and in cooperation with ME DEP is sufficient to evaluate the adequacy of the TMDL and attainment of water quality standards.

9. Implementation Plans

On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA's approval of TMDLs.

The nutrient and sediment load reductions listed in the TMDL allocations Table 4 and Appendix 1 are intended to "provide a guide for restoration plans and engineered solutions that will lower the content of nutrients and sediment in the runoff reaching the impaired streams", and improve dissolved oxygen regimes by restoring sustainable and functional aquatic communities, "by either reducing the nutrient and sediment content of the runoff or by reducing the overall amount of runoff reaching the stream" (pp. 19-21 TMDL report). Detailed, watershed-specific assessment information is provided in Appendices 6-1 through 6-21, and intended to further guide local planning and implementation actions.

We note that, in the Appendix 1 list of impaired segments, the following four stream segments require "no reduction" for all three pollutants addressed by this TMDL: Carleton Bk., Choate Bk., Dyer R., and Trout Bk. These segments are impaired, based on historic dissolved oxygen data, as well as other measures of aquatic life support. We also note that the Rapid Assessment Scores (in Fig. 2 of each stream-specific report in Appendix 6) for each of these streams fall within the range of habitat scores for the attainment streams. Even though the modeling results for TP, TN, and TSS indicate no reductions are needed, we would like to point out that each stream-specific report provides information on site-specific work to be done in the watershed to address the impairment issues with low dissolved oxygen.

Assessment: Addressed, though not required. EPA is taking no action on the implementation plan.

10. Reasonable Assurances

EPA guidance calls for reasonable assurances when TMDLs are developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for EPA to determine that the load and wasteload allocations will achieve water quality standards.

In a water impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, States/Tribes are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State/Tribe implementation plans and "may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs."

This TMDL addresses NPS runoff to small impaired streams from rural and suburban areas. ME DEP addresses reasonable assurances first by emphasizing that "water quality impairments in these streams will require identification and assessment of individual NPS pollution sites in the watershed" (p. 19, TMDL report). For each impaired waterbody addressed by these TMDLs, the LAs (for background sources, nonpoint sources, and non-regulated stormwater) are given the same TP, TN, and TSS allocations as the WLAs (for MEPDES regulated stormwater sources). The load reductions provide a guide for restoration plans and engineered solutions, the implementation of which will lower the content of nutrients and sediments in the runoff reaching the stream, and improve water quality. The same load reductions are assigned to an acre of the

watershed, whether that acre is located in an MS4 designated area, or not, although no watersheds with MS4 designated areas are currently addressed by this TMDL.

Assessment: Addressed, though not required, since this TMDL does not establish less stringent WLAs in reliance on greater load reductions from nonpoint sources.

11. Public Participation

EPA policy is that there must be full and meaningful public participation in the TMDL development process. Each State/Tribe must, therefore, provide for public participation consistent with its own continuing planning process and public participation requirements (40 C.F.R. § 130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval must describe the State/Tribe's public participation process, including a summary of significant comments and the State/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. § 130.7(d)(2)).

Inadequate public participation could be a basis for disapproving a TMDL; however, where EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

The public participation process for Maine Statewide TMDL for NPS Pollution is described on page 21 of the TMDL report. Paper and electronic forms of the public review draft report were made available for public review. The public review draft of the TMDL and appendices were posted for public review on ME DEP's website on December 22, 2015, and the notice was e-mailed to the Department's public interest contact list at that time. Ads were placed in the legal advertising sections of local papers regarding the comment period ending January 29, 2016, and a public comment meeting was scheduled on January 19, 2016, in Augusta, ME. ME DEP fully addressed comments received during public review in Appendix 5 of the final TMDL report.

Assessment: EPA Region 1 concludes that ME DEP has done a sufficient job of involving the public during the development of the TMDL, has provided adequate opportunities for the public to comment on the TMDL, and has provided reasonable responses to the public comments.

12. Submittal Letter

A submittal letter should be included with the TMDL analytical document, and should specify whether the TMDL is being submitted for a technical review or is a final submittal. Each final TMDL submitted to EPA must be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final submittal, should contain such information as the name and location of the waterbody, the pollutant(s) of concern, and the priority ranking of the waterbody.

Assessment: ME DEP's letter dated July 5, 2016 (and e-mail of July 6, 2016, forwarding electronic documents of the final revised report) indicate that the TMDL is being formally submitted for EPA approval.

Data for entry into EPA's National TMDL Tracking System							
TMDL Name*	Maine Statewide TMDL for Nonpoint Source (NPS) Pollution						
Number of TMDLs*	63						
Type of TMDLs*	Nutrients (Phosphorus, Nitrogen) and Sediment (on areal basis)						
Number of listed causes (from 303(d) list)	24						
Lead State	Maine (ME)						
TMDL Status	Final						
Individual TMDLs listed below							
TMDL Segment Name	TMDL Segment ID# (ME ADB#)	TMDL Pollutant ID# & Name	Pollutant Endpoint	TMDL Impairment Causes(s)	Unlisted ?	MEDEP Point Source ID#	Listed for anything else?
Coloney Brook	ME0101000413_146R02	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	773 Benthic Macroinvertebrate Bioassessments 884 Periphyton (Aufwuchs) Indicator Bioassessments			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Everett Brook	ME0101000412_143R01	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Merritt Brook	ME0101000412_143R02	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	773 Benthic Macroinvertebrate Bioassessments			

		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen	884 Periphyton (Aufwuchs) Indicator Bioassessments			
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Burnham Brook	ME0102000510_224R01	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Crooked Brook	ME0102000510_224R07	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	884 Periphyton (Aufwuchs) Indicator Bioassessments			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Warren Brook	ME0105000218_521R01	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				

Brackett Brook	ME0103000308_325R02	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Carlton Brook	ME0105000305_528R06	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Chamberlain Brook	ME0105000305_528R08_01	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Choate Brook	ME0105000305_528R07	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				

		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Dyer River	ME0105000305_528R03	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Jock Stream	ME0103000311_334R03	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	884 Nutrient/Eutrophi-cation Biological Indicators 225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Meadow Brook	ME0105000305_528R05	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Mill Stream	ME0103000309_327R01	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			

		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Mulligan Stream	ME0103000308_325R03	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Trout Brook	ME0105000305_528R04	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Chandler River	ME0106000102_603R02	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				

Hobbs Brook	ME0106000103_607R06	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Penley Brook	ME0104000210_413R02	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
Thayer Brook	ME0106000103_607R10	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				
		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
West Brook	ME0106000304_625R03	515 (Total Phosphorus)	0.244 (kg/ha/yr) phosphorus	225 Dissolved Oxygen			
		511 (Total Nitrogen	5.185 (kg/ha/yr) nitrogen				

		457 (Sediment)	0.03 (1,000 kg/ha/yr) sediment				
TMDL Type	Nonpoint Sources						
Establishment Date (approval)*	Aug 9, 2016						
EPA Developed	No						
Towns affected*	Albion, Alna, Auburn, Belfast, Belmont, Charleston, China, Corinna, Corinth, Cumberland, Duram, Falmouth, Fort Fairfield, Garland, Gray, Jefferson, Monmouth, Morrill, Newcastle, Newport, North Berwick, North Yarmouth, Palmyra, Pittston, Pownal, Presque Isle, St. Albans, Wales, Wells, Whitefield, Windsor, Wiscassett.						