AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§ 1251 et seq.; the "CWA"),

The City of Nashua, New Hampshire

Is authorized to discharge from the wastewater treatment facilities located at,

Sawmill Road
Nashua, New Hampshire 03060

and from **9 Combined Sewer Overflows (CSOs)** (discharge serial numbers: 002-009 and 014); see **Attachment A** of this permit.

To the receiving waters named: **Merrimack River** (Wastewater Treatment Facility [Outfall 001] and CSOs [Outfalls #002-005 and 014]) and **Nashua River** (CSOs [Outfalls # 006-009])

In accordance with the effluent limitations, monitoring requirements and other conditions set forth herein.

This permit will become effective immediately on the first day of the calendar month following 60 days after signature.

This permit expires at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on May 31, 2000.

This permit consists of **Part I** (including effluent limitations, monitoring requirements, and related conditions), **Attachment A** (Combined Sewer Overflows), **Attachment B** (Freshwater Acute Whole Effluent Toxicity Test Procedure and Protocol (February 28, 2011)), **Attachment C** (Reassessment of Technically Based Local Limits), **Attachment D** (Industrial Pretreatment Annual Report), **Attachment E** (Summary of Required Reports), and **Part II** (Standard Conditions)

Signed this 6th day of March, 2015.

__/S/ SIGNATURE ON FILE____

Ken Moraff, Acting Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency
Region I
Boston, Massachusetts

Part I Effluent Limitations and Monitoring Requirements

A. Wastewater Treatment Facility - Outfall 001

1. During the period beginning on the effective date and lasting through the expiration date, the permittee is authorized to discharge from Outfall Serial Number 001 treated domestic, commercial and industrial wastewater effluent and stormwater to the Merrimack River. Such discharges shall be limited and monitored by the permittee as specified below. Samples taken in compliance with the monitoring requirements specified below shall be representative of the discharge and shall be taken at end of all processes, including disinfection, unless otherwise noted below or at an alternative representative location approved by the EPA and NHDES.

Effluent Characteristic	Units	Effluent Limitation			Monitoring Requirement	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow[1]	MGD	Report	—	Report	Continuous	Recorder
BOD_5[2,3] BOD_5[2,3]	mg/l lbs/day	30 4006	45 6008	50 6676	5/Week 5/Week	24-Hour Composite 24-Hour Composite
TSS[2,3] TSS[2,3]	mg/l lbs/day	30 4006	45 6008	50 6676	5/Week 5/Week	24-Hour Composite 24-Hour Composite
pH (Range)[3,4]	Standard Units	6.5 – 8.0 Standard Units			1/Day	Grab
Escherichia coli[5,6]	Colonies/100 ml	126		406	1/Day	Grab
Total Residual Chlorine[5,7]	mg/l	0.31		0.54	1/Day	Grab

See Pages 4 and 5 for Footnotes

Part I.

A.1. (Continued)

Effluent Characteristic	Units	Effluent Limitation			Monitoring Requirement	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Total Phosphorus (April 1st – Oct. 31st)	mg/l lbs/day	0.8 mg/l Report	— —	Report Report	2/Week 2/Week	24-Hour Composite 24-Hour Composite
Total Recoverable Copper[8]	µg/l	20.0	—	Report	2/Month	24-Hour Composite
Total Recoverable Lead[8]	ug/l	0.540	—	Report	2/Month	24-Hour Composite
Whole Effluent Toxicity LC_{50}[9,10,11,12,1]	Percent	—	—	100	2/Year	24-Hour Composite
Ammonia Nitrogen, as Nitrogen[13]	mg/l	—	—	Report	2/Year	24-Hour Composite
Hardness[13]	mg/l	—	—	Report	2/Year	24-Hour Composite
Alkalinity[13]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Aluminum[13]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Cadmium[13]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Copper[13]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Lead[13]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Nickel[13]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Zinc[13]	mg/l	—	—	Report	2/Year	24-Hour Composite

See Pages 4 and 5 for Footnotes

Footnotes to Part I.A.1.

1. The effluent and influent flows shall be continuously measured and recorded using a flow meter and totalizer.

2. To monitor for 85 percent removal of BOD_5 and TSS during dry weather periods, as required in Part I.A.4. of this permit, the influent concentrations of both BOD_5 and TSS shall be monitored twice per month using a 24-hour composite sample and the results reported as average monthly values. The influent concentrations shall be used to calculate the percent reduction in BOD_5 and TSS.

3. During periods when the Wet Weather Flow Treatment Facility (WWFTF) is discharging, samples collected for determining compliance with the technology-based effluent limitations for BOD_5, TSS, and pH shall be taken at a location prior to the flow combining with the effluent from the Wet Weather Flow Treatment Facility.

4. State certification requirement.

5. Samples collected for the analysis of *Escherichia coli (E. coli)* and total residual chlorine (TRC), as described in footnotes 6-7 below, shall be collected concurrently.

6. The average monthly value for *E. coli* shall be determined by calculating the geometric mean. *E. coli* shall be tested using an approved method as specified in 40 Code of Federal Regulations (C.F.R.) Part 136, List of Approved Biological Methods for Wastewater and Sewage Sludge.

7. Total residual chlorine shall be measured using any one of the following three methods listed in 40 C.F.R. Part 136:

   a. Amperometric direct.
   b. DPD-FAS.
   c. Spectrophotometric, DPD.

8. The results of the total recoverable copper and lead analyses performed in conjunction with whole effluent toxicity (WET) tests (see footnote 13) may be used to satisfy one of the monitoring requirements for these metals for the particular month in which the samples were collected.

9. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate in that sample.

10. The permittee shall conduct 48-hour freshwater acute (static) toxicity tests on effluent samples using the daphnid, *Ceriodaphnia dubi*a (*C. dubia*), and the fathead minnow, *Pimephales promelas* (*P. promelas*), as test species. The tests shall be conducted in

accordance with the procedures and protocols specified in **Attachment B** (*Freshwater Acute Toxicity Test Procedure and Protocol*, USEPA Region 1 (February 2011)).

11. Samples collected for use in whole effluent toxicity (WET) tests shall be collected and tests completed two times per year during the calendar quarters ending September 30th and March 31st. Toxicity test results are to be postmarked by the 15th day of the month following the end of the calendar quarter sampled.

12. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment B,** Section IV., Dilution Water, in order to obtain an individual written approval for the use of an alternate dilution water for future tests, or the permittee shall follow the self-implementing Alternative Dilution Water Guidance which may be used to obtain automatic approval for the use of an alternate dilution water for a retest and to request written approval for the use of an alternate dilution water for future tests, including the appropriate species for use with that water. This guidance is found in Attachment G of the NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs), which may be found on the EPA Region I web site at http://www.epa.gov/Region1/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall obtain an individual approval as outlined in **Attachment B.** Any modification or revocation to this guidance will be transmitted to the permittees. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment B**.

13. For each WET test performed, the permittee shall report on the appropriate Discharge Monitoring Report (DMR) the concentrations of ammonia nitrogen as nitrogen, hardness, alkalinity; and total recoverable aluminum, cadmium, copper, lead, nickel and zinc detected in the 100 % effluent sample. These results shall also be included in the WET test report for the calendar quarter in which the test was conducted.

    All of the aforementioned chemical parameters shall be determined to at least the Minimum Quantification Level as stated in **Attachment B**, Section VI, Chemical Analysis.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

2. The discharge shall not cause a violation of the water quality standards of the receiving water.

3. The discharge shall be adequately treated to ensure that the surface water remains free from pollutants in concentrations or combinations that settle to form harmful deposits, float as foam, debris, scum or other visible pollutants. It shall be adequately treated to ensure that the surface waters remain free from pollutants which produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render it unsuitable for its designated uses.

4. The permittee's treatment facility shall maintain a minimum of 85 removal of both total suspended solids and biochemical oxygen demand during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt (which occurs on a day in which the temperature is greater than 32^{o} F), and 24 hours after a storm event to allow the storm-related flow to pass through the collection system and treatment facilities (as recorded by a hydrograph). The percent removal shall be calculated as a monthly average using the influent and effluent BOD_5 and TSS values collected during dry weather days.

5. When the effluent discharged for a period of 3 consecutive months exceeds 80 percent of the facility's 16 million gallons per day (MGD) design flow (i.e., exceeds 12.8 MGD), the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans. Before the design flow will be reached, or whenever treatment necessary to achieve permit limits cannot be assured, the permittee may be required to submit plans for facility improvements.

6. All POTWs must provide adequate notice to both EPA Region I and the New Hampshire Department of Environmental Services, Water Division (NHDES) of the following:

   a. Any new introduction of pollutants into the POTW from an indirect discharger in a primary industry category (see 40 C.F.R. §122 Appendix A, as amended) discharging process water; and

   b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

   For purposes of this paragraph, adequate notice shall include information on:

   a. The quantity and quality of effluent introduced into the facility; and

   b. Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the facility.

7. The permittee shall not discharge into the receiving water any pollutant or combination of pollutants in toxic amounts.

B. COMBINED SEWER OVERFLOWs (CSOs)

1. Combined Sewer Overflow Outfalls # 002 – 009 and 014

During the period beginning on the effective date and lasting through the expiration date, the permittee is authorized to discharge stormwater and wastewater from combined sewer overflow (CSO) outfalls numbered 002 - 005 and 014 into the Merrimack River and from CSO outfalls numbered 006-009 into the Nashua River (see **Attachment A**). These discharges are authorized only during wet weather (i.e., any period in which there is greater than 0.1 inches of rain and/or snow melt). Such discharges shall be limited and monitored by the permittee as specified below. Samples taken in compliance with the requirements specified below shall be collected at a location that provides a representative analysis of the effluent.

Effluent Characteristic	**Units**	**Effluent Limitation**	**Monitoring Requirement**	
Parameter		**Wet Weather Event Maximum**	**Measurement Frequency**	**Sample Type**
Escherichia coli[1,2]	Colonies/100 ml	1000	1/Year	Grab

See Page 8 for Footnotes

Footnotes to Part I.B.1.

1. Each of the CSO outfalls identified in **Attachment A** of this permit shall be sampled, at a minimum, once per year. The sampling shall occur during a wet weather discharge event. One grab sample shall be collected within one-half hour after the outfall begins discharging and the results shall be reported. The sampling may be conducted during the POTW's normal business hours; however, sampling may be conducted outside of those hours at the discretion of the permittee. If more than one sample is collected per outfall per wet weather discharge event, all of the sampling results shall be used to calculate the geometric mean, which shall be recorded on the DMRs as the "event maximum".

2. Results from each year's sampling shall be reported with each December's discharge monitoring report (DMR) which shall be postmarked by January 15th. If an individual CSO does not discharge or does not discharge sufficiently to collect a sample during the calendar year, report a "C" for that outfall on the December DMR.

3. *E. coli* shall be analyzed using an approved method as specified in 40 C.F.R. Part 136, List of Approved Biological Methods for Wastewater and Sewage Sludge.

Part I.B.1. (Continued)

During wet weather, the permittee is authorized to discharge storm water/wastewater from the combined sewer outfalls listed in **Attachment A**, subject to the following conditions.

a. The discharges shall receive treatment at a level providing Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT) to control and abate conventional pollutants and Best Available Technology Economically Achievable (BAT) to control and abate non-conventional and toxic pollutants. The EPA has made a Best Professional Judgment (BPJ) determination that BPT, BCT, and BAT for combined sewer overflow (CSO) control include the implementation of the Nine Minimum Controls (NMCs) specified below and detailed further in **Part I.B.2** (Nine Minimum Controls, Minimum Implementation Levels) of this permit:

(1) Proper operation and regular maintenance programs for the sewer system and the combined sewer overflow outfalls.
(2) Maximum use of the collection system for storage.
(3) Review and modification of pretreatment requirements to assure CSO impacts are minimized.
(4) Maximization of flow to the POTW for treatment.
(5) Elimination of dry weather overflows from CSOs.
(6) Control of solid and floatable materials in CSOs.
(7) Pollution prevention programs that focus on contaminant reduction activities.
(8) Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts.

(9) Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

b. Implementation of these controls is required by the effective date of the permit. Until the review and update of the program for implementing the NMCs, as required in Part I.B.1.c of this draft permit, has been completed, the permittee shall continue to implement the NMCs in accordance with the documentation submitted by the City on April 30, 2010, titled "High Flow Management Plan", except where the minimum implementation levels described in Part I.B.2. are more stringent. Upon completion of the review, the nine minimum controls shall then be implemented in accordance with the updated documentation, except as updated pursuant to the annual reporting requirements in Part I.B.4.

c. **Within twelve months of the effective date of the permit**, the permittee shall review and update (as necessary) its program for implementing the Nine Minimum Controls, and shall submit to EPA and NHDES updated documentation of this program, which shall include a certification that this review has been performed and a description of any resultant revisions made to the program. EPA and NHDES consider that approvable documentation must include the minimum requirements set forth in Part I.B.2. of this permit and additional activities the permittee can reasonably undertake.

d. The discharges shall not cause or contribute to violations of state water quality standards in the receiving waters.

2. Nine Minimum Controls Minimum Implementation Levels

a. The permittee shall implement the nine minimum controls in accordance with the documentation provided to EPA and NHDES under Part I.B.1. of this permit, or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the items listed below (Part I.B.2.) plus any other controls the permittee can feasibly implement as set forth in the documentation.

b. Each CSO structure/regulator, and/or pumping station shall be routinely inspected at a minimum of once per month to insure that they are in good working condition and adjusted to minimize combined sewer discharges (NMCs #1, 2, and 4). The following inspection results shall be recorded: date and time of the inspection, the general condition of the facility, and whether the facility is operating satisfactorily. The following information shall be recorded if maintenance is necessary: a description of the necessary maintenance, the date the necessary maintenance was performed, and whether the observed problem was corrected. The permittee shall maintain records of all inspections for a minimum of three years.

c. Discharges to the combined sewer system of septage, holding tank wastes or other material which may cause a visible oil sheen or containing a floatable material are prohibited during wet weather when CSO discharges may be active (NMCs #3, 6, and 7).

d. Dry weather overflows (DWOs) are prohibited (NMC # 5). Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt (which occurs on a day in which the temperature is greater than 32° F), and 24 hours after a storm event to allow the storm-related flow to pass through the collection system and treatment facilities (as recorded by a hydrograph). All dry weather sanitary and/or industrial discharges from CSOs must be reported to EPA and NHDES within 24 hours and a written report provided within five days of the overflow in accordance with the reporting requirements for plant bypass (Paragraph D.1.e. of Part II of this permit and 40 C.F.R. § 122.41(l)(6).

e. The permittee shall quantify and record all discharges from combined sewer outfalls (NMC # 9). Quantification shall be through direct measurement. The following information shall be recorded for each combined sewer outfall for each discharge event:

- Duration (hours) of discharge;
- Volume (gallons) of discharge; and
- Precipitation data collected by the City of Nashua's rain gages at daily (24-hour) intervals and one-hour intervals. Cumulative precipitation per discharge event shall be calculated.

The permittee shall maintain all records of discharges for at least three years after the effective date of the permit.

f. The permittee shall install and maintain identification signs for all combined sewer outfall structures (NMC #8). The signs must be located at or near the combined sewer outfall structures and be easily readable by the public. These signs shall be a minimum of 12 x 18 inches in size, with white lettering on both sides against a green background, and shall contain the following information:

CITY OF NASHUA
WET WEATHER
SEWAGE DISCHARGE
OUTFALL (discharge serial number)

The permittee, to the extent practicable, shall add a universal symbol to its warning signs reflecting a CSO discharge, or place additional signs in languages other than English based on notification from the EPA and NHDES or on the permittee's own determination that the primary language of a substantial percentage of the residents in the vicinity of a given outfall structure is not English.

g. The permittee shall issue an annual notification to the public which shall include (a) general information on CSOs, (b) their locations in Merrimack River Watershed, (c) potential health risks posed by exposure to CSO discharges, and (d) a status update of measures taken during the previous calendar year to reduce occurrences of CSO discharges.

3. Nine Minimum Controls Annual Reporting Requirement

Annually, no later than **March 1st** of each year, the permittee shall submit a report to EPA and NHDES summarizing activities undertaken during the previous calendar year relating to compliance with the nine minimum controls. This report shall include, but not be limited to, the following:

a. A certification which states that the once-per-month inspections required in Part I.B.2.b. of the permit were conducted, results recorded, and records maintained.

b. A certification which states that all discharges from CSOs were recorded and records maintained for the previous calendar year. In addition, a summary of the previous year's discharge monitoring information required by Part I.B.2.e. of this draft permit, including activation frequencies and discharge volumes, for all of the authorized combined sewer overflow outfalls identified in **Attachment A** of this permit, shall be submitted as an attachment to this certification.

c. Precipitation data for each day of the previous calendar year, including total rainfall, peak intensity, and average intensity.

d. A summary of modifications to the NMC program which have been evaluated, and a description of those which will be implemented during the upcoming year.

e. In the first annual report submitted in accordance with this permit, the permittee shall update the public notification plan describing the measures actively being taken to meet NMC #8 (see Part I.B.1.) and an evaluation of further measures to enhance the public notification program, including the following:

(1) Outfall signs visible from both water and land.

(2) Signs/notices at areas where people may be using CSO-impacted waters for recreation such as swimming, boating, fishing, and places where the public may gain access to the water (e.g. boat put-in areas). The notice would include information on the health risks posed by CSOs and sources for additional information on CSOs and water quality.

(3) Analysis of precipitation data collected by the City of Nashua's rain gages located throughout the collection system and CSO discharge data to estimate the threshold rain events which normally cause overflows. This evaluation shall be conducted on data collected beginning the effective date of the permit.

(4) Annually, **by April 15th**, the permittee shall provide the public with an update on the progress made in reducing CSO discharge events during the previous calendar year and shall also include a reference to contacts for additional information on CSOs and their impact on water quality.

(6) **Within six months of the effective date of the permit**, and annually thereafter, the permittee shall update its website to include (a) general information on CSOs, (b) their locations in Merrimack River Watershed, (c) potential health risks posed by exposure to CSO discharges, and (d) a link to the City's website which describes the progress on abatement projects and the most current information on CSO activations including the frequency, duration, and volume of each discharge.

(7) Notification to downstream public or privately owned water supply systems drawing water from the same receiving water and located within 20 miles downstream of the point of discharge, within 24 hours of discharge from a CSO. When the City of Nashua WWTF's staff is unavailable to confirm an actual discharge from a CSO during a significant precipitation event, the permittee shall report the probable occurrence of a CSO discharge in the same manner. Subsequently, the occurrence of the CSO discharge event shall be confirmed or dispelled as information becomes available. The planned notice contact list shall be provided to EPA and NHDES **within 1 month of the effective date of the** permit.

The public notification plan shall include a schedule for implementation of enhanced public notice measures.

4. Wet Weather Flow Treatment Facility and Screening and Disinfection Facility

In addition to the requirements described above, the Wet Weather Flow Treatment Facility (WWFTF) and Screening and Disinfection Facility (SDF) are subject to additional monitoring requirements as enhanced minimum controls, as set forth in Table I.B.5.a. and Table I.B.5.b.

Discharges from these facilities shall not cause or contribute to violations of the water quality standards in the receiving water.

Part I.B.5.

a. Wet Weather Flow Treatment Facility - internal outfall (001W) to the chlorine contact chamber - Effluent Limitations and Monitoring Requirements

During the period beginning on the effective date and lasting through the expiration date, the permittee is authorized to discharge from Outfall Serial Number 001W (internal outfall to chlorine contact chamber) domestic, commercial and industrial wastewater and stormwater to the chlorine contact chamber before final discharge to the Merrimack River. Such discharges shall be limited and monitored by the permittee as specified below.

Effluent Characteristic	**Effluent Limitation**				**Monitoring Requirement[1]**	
Parameter	**Average Monthly**		**Maximum Daily**		**Measurement Frequency**	**Sample Type**
BOD_5[2]	Report (mg/l and lbs/day)		Report (mg/l and lbs/day)		1/Month	Event Composite[3,4]
TSS[2]	Report mg/l and lbs/day)		Report (mg/l and lbs/day)		1/Month	Event Composite[3,4]
Parameter	**Total Monthly**	**Maximum Hourly**	**Duration**	**Frequency**	**Measurement Frequency**	**Sample Type**
Flow into the WWFTF[58]	Report (MG)	Report (MGD)	Report (Total Hours)	Report (# of Events)	Per Event[4]	Recorder
Flow discharged from the WWFTF to the chlorine contact tank[6]	Report (MG)	Report (MGD)	Report (Total # of Hours)	Report (# of Events)	Per Event[4]	Recorder
Flow drained back to the POTW[7]	Report (MG)	Report (MGD)	Report (Total of Hours)	Report (#of Events)	Per Event[4]	Recorder
Rainfall Precipitation[9]	See Footnote 8				Per Event[4]	Recorder

See Page 14 for Footnotes

Footnotes to Part I.B.5.a.

1. Samples taken in compliance with the monitoring requirements specified in table B.5.a. shall be collected at a point before the chlorine contact chamber, or at an alternative representative location approved by the EPA and NHDES, and shall be representative of the discharge.

2. The influent and effluent concentrations of BOD_5 and TSS shall be monitored at a frequency of once per month when there is flow through the facility. The influent concentrations shall be used to calculate the percent reduction in BOD_5 and TSS.

3. An event composite must represent an event when there is flow discharged from the facility for a duration of at least four hours. An event composite is considered to represent an event duration of at least four hours where (i) the composite represents at least four consecutive hours of flow through the facility; or (ii) the composite represents at least four hours of flow through the facility during a 24-hour period starting at approximately 8:00 AM each day (+/- 2 hours) coinciding with the permittee's composite sampling schedule, if flows through the facility are discontinuous.

4. An "event" is defined as anytime there is flow into the WWFTF.

5. Report total flow (million gallons (MG)), peak flow rate (MGD) and duration (total hours), each time there is flow into the facility.

6. Report total flow (MG), peak flow rate (MGD) and duration (total hours), each time there is flow discharged from the facility toward the chlorine contact tank.

7. Report total flow (MG), peak flow rate (MGD) and duration (total hours), each time there is flow drained back to the POTW for secondary treatment.

8. Report precipitation data for the Nashua area per activation event. Report the intensity (inches/hour) and duration (total hours/event) of each rain event whenever there is flow into the WWFTF. Preciptitaion data that is collected in accordance with the LTCP may be used to satisfy this reporting requirements, provided that the intensity and duration of each rain event is included.

Part I.B.5.

b. Screening and Disinfection Facility (SDF) (Outfall No. 014) - Effluent Limitations and Monitoring Requirements

During the period beginning on the effective date[1] and lasting through the expiration date, the permittee is authorized to discharge from Outfall Serial Number 014 to the Merrimack River combined wastewater and stormwater.

Effluent Characteristic	Effluent Limitation[1]		Monitoring Requirement[2]	
Parameter	**Average Monthly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
BOD_5[,2]	Report (mg/l and lbs/day)	Report (mg/l and lbs/day)	1/Month	Event Composite[3,4]
TSS[,2]	Report (mg/l and lbs/day)	Report (mg/l and lbs/day)	1/Month	Event Composite[3,4]
Total Residual Chlorine[5,7]	63.2 µg/l	109 µg/l	1 Event/Month[3]	Grab
	Wet Weather Event Maximum			
Escherichia coli[,5,6]	1,000 colonies/100 mL		1 Event/Month[3]	Grab

See Page 17 for Footnotes

Part I.B.5.b.Screening and Disinfection Facility (Continued)

Effluent Characteristic	Effluent Limitation				Monitoring Requirement[2]	
Parameter	**Total Monthly**	**Maximum Hourly**	**Duration**	**Frequency**	**Measurement Frequency**	**Sample Type**
Flow into the SDF[9]	Report (MG)	Report (MGD)	Report (Total of Hours)	Report (# of Events)	Per Event[5]	Recorder
Flow discharged from the SDF to the Merrimack River [10]	Report (MG)	Report (MGD)	Report (Total of Hours)	Report (# of Events)	Per Event[5]	Recorder
Flow drained back to the collection system[11]	Report (MG)	Report (MGD)	Report (Total # of Hours)	Report (#of Events)[8]	Per Event[5]	Recorder
Rainfall Precipitation[12]	See Footnote 12				Per Event[5]	Recorder

See Page 17 for Footnotes

Footnotes to Part I.B.5.b.

1. Samples taken in compliance with the monitoring requirements specified in Part I.B.5.b. shall be taken at a location that provides a representative sample of the discharge or at an alternative location approved by the EPA and NHDES.

2. The influent and effluent concentrations of BOD_5 and TSS shall be monitored at a frequency of once per month when there is flow through the facility. The influent concentrations shall be used to calculate the percent reduction in BOD_5 and TSS.

3. An "event" is defined as anytime there is flow into the SDF.

4. An event composite must represent an event when there is flow discharged from the facility for a duration of at least four hours. An event composite is considered to represent an event duration of at least four hours where (i) the composite represents at least four consecutive hours of flow through the facility; or (ii) the composite represents at least four hours of flow through the facility during a 24-hour period starting at approximately 8:00 AM each day (+/- 2 hours) coinciding with the permittee's composite sampling schedule, if flows through the facility are discontinuous.

5. Samples collected for the analysis of *Escherichia coli (E. coli)* and total residual chlorine (TRC), as described in footnotes 6-7 below, shall be collected concurrently.

6. The average monthly value for *E. coli* shall be determined by calculating the geometric mean. *E. coli* shall be tested using an approved method as specified in 40 Code of Federal Regulations (C.F.R.) Part 136, List of Approved Biological Methods for Wastewater and Sewage Sludge.

7. Total residual chlorine shall be measured using any one of the following three methods listed in 40 C.F.R. Part 136:

   a. Amperometric direct.
   b. DPD-FAS.
   c. Spectrophotometric, DPD.

8. Report total flow (million gallons (MG), peak flow rate (MGD) and duration (total hours), each time there is flow into the facility.

9. Report total flow (MG), peak flow rate (MGD) and duration (total hours), each time there is flow discharged from the facility to the Merrimack River.

10. Report total flow (MG), peak flow rate (MGD) and duration (total hours), each time there is flow drained back to the collection system.

11. Report precipitation data for the Nashua area, per activation event. Report the intensity (inches/hour) and duration (total hours/event) of each rain event whenever there is flow into the SDF. Precipitation data that is collected in accordance with the LTCP may be used to satisfy this reporting requirements, provided that the intensity and duration of each rain event is included.

C. SPECIAL CONDITIONS

During periods of wet weather, the wastewater treatment facility and the wet weather flow treatment facility shall be operated in a manner that is consistent with the City of Nashua's High Flow Management Plan (HFMP), dated 2010, or the most current EPA-approved High Flow Management Plan.

D. UNAUTHORIZED DISCHARGES

The permit only authorizes discharges in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) and unauthorized CSOs, are not authorized by this permit and shall be reported in accordance with Part II, Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting).

E. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions. The permittee is required to complete the following activities for the collection system (both the combined and sanitary collection systems) which it owns:

1. Maintenance Staff

   The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. This requirement shall be described in the Collection System O & M Plan required pursuant to Section E.5. below.

2. Preventative Maintenance Program

   The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. This requirement shall be described in the Collection System O & M Plan required pursuant to Section D.5. below.

3. Infiltration/Inflow

The permittee shall control infiltration and inflow (I/I) into the separate sewer system as necessary to prevent high flow-related unauthorized discharges from their collection systems and high flow-related violations of the wastewater treatment plant's effluent limitations. Plans and programs to control I/I shall be described in the Collection System O & M Plan required pursuant to Section E.5. below.

4. Collection System Mapping

Within 30 months of the effective date of this permit, the permittee shall prepare a map of the sewer collection system it owns (see page 1 of this permit for the effective date). The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up to date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

a. All sanitary sewer lines and related manholes;
b. All combined sewer lines, related manholes, and catch basins;
c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g., combined manholes);
d. All outfalls, including the treatment plant outfall(s), CSOs, combined manholes, and any known or suspected SSOs;
e. All pump stations and force mains;
f. The wastewater treatment facility(ies);
g. All surface waters (labeled);
h. Other major appurtenances such as inverted siphons and air release valves;
i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;
j. The scale and a north arrow; and
k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

Any mapping of the collection system that has already been performed may be used to satisfy this requirement, as long as all of the components identified above in (a) through (k) are included.

5. Collection System Operation and Maintenance Plan

The permittee shall develop and implement a Collection System Operation and Maintenance Plan.

a. **Within six (6) months of the effective date of the permit**, the permittee shall submit to EPA and NHDES:

(1) A description of the collection system management goals, staffing, information management, and legal authorities;

(2) A description of the overall condition of the collection system including a list of recent studies and construction activities; and
(3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in paragraphs b.1. through b.7. below.

b. The full Collection System O & M Plan shall be submitted to EPA and NHDES and implemented **within twenty four (24) months from the effective date of this permit**. The Plan shall include:

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;
(2) A preventative maintenance and monitoring program for the collection system;
(3) Sufficient staffing to properly operate and maintain the sanitary sewer collection system;
(4) Sufficient funding and the source(s) of funding for implementing the plan;
(5) Identification of known and suspected overflows and back-ups, including combined manholes, a description of the cause of the identified overflows and back-ups, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
(6) A description of the permittee's program for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnections and redirection of illegal sump pumps and roof down spouts; and
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and NHDES **annually by March 31**. The first annual report is due 36 months following the effective date of the permit. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;
b. A map and a description of inspection and maintenance activities conducted and
c. corrective actions taken during the previous year;
d. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
e. A map with areas identified for investigation/action in the coming year;
f. If treatment plant flow has reached 80% of the 16 MGD design flow (12.8 MGD) or there have been capacity related overflows, submit a calculation of the

maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and

g. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

F. ALTERNATIVE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the permittee shall provide an alternate power source with which to sufficiently operate the wastewater facility, as defined at 40 C.F.R. § 122.2, which references the definition at 40 C.F.R. § 403.3(o). Wastewater facility is defined by RSA 485A:2.XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge.

G. INDUSTRIAL PRETREATMENT PROGRAM CONDITIONS

1. Limitations for Industrial Users:

   a. A user may not introduce into a POTW any pollutant(s) which cause pass through or interference with the operation or performance of the treatment works. The terms "user", "pass through" and "interference" are defined in 40 C.F.R. § 403.3.

   b. The permittee shall develop and enforce specific effluent limits (local limits) for Industrial Users(s) and all other users as necessary, which together with appropriate changes in the POTW Treatment Plant's facilities or operation, are essential to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. **Within 90 days of the effective date of this permit**, the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. As part of this evaluation, the permittee shall assess how the POTW performs with respect to influent and effluent pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety, and collection system concerns. In preparing this evaluation, the permittee shall complete and submit the attached form (**Attachment C Reassessment of Technically Based Industrial Discharge Limits**) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).

2. Industrial Pretreatment Program

a. The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the permittee's approved Pretreatment Program and the General Pretreatment Regulations, 40 C.F.R. §403. At a minimum, the permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

(1) Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP, but in no case less than once per year, and maintain adequate records.

(2) Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.

(3) Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.

(4) Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

(5) The permittee shall provide the EPA and the NHDES with an annual report describing the permittee's pretreatment program activities for the twelve month period ending 60 days prior to the due date in accordance with 40 C.F.R. §403.12(i). The annual report shall be consistent with the format described in **Attachment D** (NPDES Permit Requirement for Industrial Pretreatment Annual Report) and shall be submitted no later than **March 1st** of each year.

(6) The permittee must obtain approval from EPA prior to making any significant changes the industrial pretreatment program in accordance with 40 C.F.R.. §403.18(c).

(7) The permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 C.F.R. §405 et. seq.

(8) The permittee must modify its pretreatment program to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the Industrial Pretreatment Program. The permittee must provide EPA, in writing, **within 180 days of the effective date of this**

permit, proposed changes to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the permittee must address in its written submission the following areas: (1) enforcement response plan; (2) revised sewer use ordinances; and (3) slug control evaluations. The permittee will implement these proposed changes pending EPA's approval under 40 C.F.R. §403.18.

H. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal & state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.

2. The permittee shall comply with the more stringent of either the state (Env-Wq 800) or federal (40 C.F.R. Part 503) requirements.

3. The requirements and technical standards of 40 C.F.R. Part 503 apply to facilities which perform one or more of the following use or disposal practices.

   a. Land application - the use of sewage sludge to condition or fertilize the soil.
   b. Surface disposal - the placement of sewage sludge in a sludge-only landfill.
   c. Sewage sludge incineration in a sludge-only incinerator.

4. The 40 C.F.R. Part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions do not apply to facilities which do not dispose of sewage sludge during the life of the permit, but rather treat the sludge (lagoons, reed beds), or are otherwise excluded under 40 C.F.R. Section 503.6.

5. The permittee shall use and comply with the *NPDES Permit Sludge Compliance Guidance* (USEPA November 4, 1999), to determine appropriate conditions. This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf. Appropriate conditions contain the following elements:

   General requirements
   Pollutant limitations
   Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
   Management practices
   Record keeping
   Monitoring
   Reporting

   Depending upon the quality of material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction for the permittee's chosen sewage sludge use or disposal practices at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year.

less than 290	1/Year
290 to less than 1,500	1/Quarter
1,500 to less than 15,000	6/Year
15,000 plus	1/Month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 C.F.R. Section 503.8.

8. The permittee shall submit an annual report containing the information specified in the *NPDES Permit Sludge Compliance Guidance.* Reports are **due annually by February 19th.** Reports shall be submitted to both addresses (EPA-Region I and NHDES) contained in the reporting section of the permit.

I. MONITORING AND REPORTING

1. **For a period of one year from the effective date of the permit,** the permittee may either submit monitoring data and other reports to EPA in hard copy form or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit Discharge Monitoring Reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the permit,** the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting DMRs and reports. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

   a. Submittal of Reports Using NetDMR

      NetDMR is accessed from: http://www.epa.gov/netdmr. **Within one year of the effective date of this permit**, the permittee shall begin submitting DMRs and reports required under this permit electronically to EPA using NetDMR, unless the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt-out request").

      DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA, including the NHDES Monthly Operating Reports (MORs), as an electronic attachment to the DMR. Once a permittee

begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA or to NHDES.

b. Submittal of NetDMR Opt-out Requests

Opt-out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under this permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt-out request and such request is approved by EPA. All opt-out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

And

Attn: Compliance Supervisor
New Hampshire Department of Environmental Services (NHDES)
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

c. Submittal of Reports in Hard Copy Form

Monitoring results shall be summarized for each calendar month and reported on separate hard copy DMRs postmarked no later than the 15th day of the month following the completed reporting period. All reports required under the permit, including NHDES MORs, shall be submitted as an attachment to the DMRs. Signed and dated original DMRs and all other reports (with the exception of pretreatment reports) or notifications required herein or in Part II shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Water Technical Unit (OES04-SMR)
5 Post Office Square - Suite 100
Boston, MA 02109-3912

All pretreatment reports shall be submitted to:

U.S. Environmental Protection Agency
Attn: Justin Pimpare
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100
OEP06-03
Boston, MA 02109-3912

Duplicate signed copies of all reports or notifications required above shall be submitted to the State at the following address:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

Any verbal reports, if required in **Parts I** and/or **II** of this permit, shall be made to both EPA-New England and to NHDES.

J. STATE PERMIT CONDITIONS

1. The permittee shall not at any time, either alone or in conjunction with any person or persons, cause directly or indirectly the discharge of waste into the said receiving water unless it has been treated in such a manner as will not lower the legislated water quality classification or interfere with the uses assigned to said water by the New Hampshire Legislature (RSA 485-A:12).

2. This NPDES discharge permit is issued by EPA under federal and state law. Upon final issuance by EPA, the New Hampshire Department of Environmental Services-Water Division (NHDES) may adopt this permit, including all terms and conditions, as a state permit pursuant to RSA 485-A:13.

3. EPA shall have the right to enforce the terms and conditions of this permit pursuant to federal law and NHDES shall have the right to enforce the permit pursuant to state law, if the permit is adopted. Any modification, suspension, or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of the permit as issued by the other agency.

4. Pursuant to New Hampshire Statute RSA 485-A13, I(c), any person responsible for a bypass or upset at a *wastewater facility* shall give immediate notice of a bypass or upset to all public or privately owned water systems drawing water from the same receiving water and located within 20 miles downstream of the point of discharge regardless of whether or not it is on the same receiving water or on another surface water to which the receiving water is tributary. Wastewater facility is defined at RSA

485-A:2XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge. The permittee shall maintain a list of persons, and their telephone numbers, who are to be notified immediately by telephone. In addition, written notification, which shall be postmarked within 3 days of the bypass or upset, shall be sent to such persons.

5. The pH range of 6.5 to 8.0 Standard Units (S.U.) must be achieved in the final effluent.

6. Pursuant to New Hampshire Code of Administrative Rules, Env- Wq 703.07(a):

   a. Any person proposing to construct or modify any of the following shall submit an application for a sewer connection permit to the department:

      (1) Any extension of a collector or interceptor, whether public or private, regardless of flow;
      (2) Any wastewater connection or other discharge in excess of 5,000 gpd;
      (3) Any wastewater connection or other discharge to a wastewater treatment plant operating in excess of 80 percent design flow capacity based on actual average flow for 3 consecutive months;
      (4) Any industrial wastewater connection or change in existing discharge of industrial wastewater, regardless of quality or quantity; and
      (5) Any sewage pumping station greater than 50 gallons per minute (gpm) or serving more than one building.

7. For each new or increased discharge of industrial waste to the POTW, the permittee shall submit, in accordance with Env-Wq 904.14(e) an "Industrial Wastewater Discharge Request Application" approved by the permittee in accordance with 904.13(a). The "Industrial Wastewater Discharge Request Application" shall be prepared in accordance with Env-Wq 904.10.

8. Pursuant to Env-Wq 904.17, at a frequency of no less than every five years, the permittee shall submit to NHDES:

   a. A copy of its current sewer use ordinance. The sewer use ordinance shall include local limits pursuant to Env-Wq 904.04(a).

   b. A current list of all significant indirect dischargers to the POTW. At a minimum, the list shall include for each significant indirect discharger, its name and address, the name and daytime telephone number of a contact person, products manufactured, industrial processes used, existing pretreatment processes, and discharge permit status.

   c. A list of all permitted indirect dischargers; and

d. A certification that the municipality is strictly enforcing its sewer use ordinance and all discharge permits it has issued.

9. In addition to submitting DMRs, monitoring results shall also be summarized for each calendar month and reported on separate Monthly Operations Report Form(s) (MORs) postmarked or submitted electronically using NetDMR no later than the 15th day of the month following the completed reporting period. Signed and dated MORs, which are not submitted electronically using NetDMR shall be submitted to:

New Hampshire Department of Environmental Services (NHDES)
Water Division
Wastewater Engineering Bureau
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095

Attachment A

City of Nashua – Combined Sewer Overflow Outfalls (CSOs)

CSO Outfall No.	Location	Interceptor Sub-System	Receiving Water
002	Salmon Brook	Salmon Brook Interceptor	Merrimack River
003	Farmington Road	South Merrimack Interceptor	Merrimack River
004	Burke Street	North Merrimack River Interceptor	Merrimack River
005	East Hollis Street	North Merrimack River Interceptor	Merrimack River
006	Nashua River	North Merrimack River Interceptor	Nashua River
007	Tampa Street	Nashua River Interceptor	Nashua River
008	Broad Street	Nashua River Interceptor	Nashua River
009	Lock Street	North Merrimack River Interceptor	Nashua River
014	SDF	North Merrimack River Interceptor	Merrimack River

ATTACHMENT B

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**

- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

http://water.epa.gov/scitech/swguidance/methods/wet/index.cfm#methods

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions[3]	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C):	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality:	Ambient laboratory illumination
4.	Photoperiod:	16 hr light, 8 hr dark
5.	Size of test vessels:	250 mL minimum
6.	Volume of test solution:	Minimum 200 mL/replicate
7.	Age of fish:	1-14 days old and age within 24 hrs of each ~~the~~ others~~~~
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration:	40
11.	Feeding regime:	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration:	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water:[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions[3]	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour

intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1,]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3,]	x		0.02
Alkalinity	x	x	2.0
pH[4]	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	x		--
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     -Method 2340B (hardness by calculation)
     -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     -Method 4500-CL E Low Level Amperometric Titration
     -Method 4500-CL G DPD Colorimetric Method

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See the flow chart in Figure 6 on p. 73 of EPA-821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See the flow chart in Figure 13 on p. 87 of EPA-821-R-02-012 .

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

ATTACHMENT C

EPA - New England

Reassessment of Technically Based Industrial Discharge Limits

Under 40 CFR §122.21(j)(4), all Publicly Owned Treatment Works (POTWs) with approved Industrial Pretreatment Programs (IPPs) shall provide the following information to the Director: a written evaluation of the need to revise local industrial discharge limits under 40 CFR §403.5(c)(1).

Below is a form designed by the U.S. Environmental Protection Agency (EPA - New England) to assist POTWs with approved IPPs in evaluating whether their existing Technically Based Local Limits (TBLLs) need to be recalculated. The form allows the permittee and EPA to evaluate and compare pertinent information used in previous TBLLs calculations against present conditions at the POTW.

Please read direction below before filling out form.

ITEM I.

* In Column (1), list what your POTW's influent flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present influent flow rate. Your current flow rate should be calculated using the POTW's average daily flow rate from the previous 12 months.

* In Column (1) list what your POTW's SIU flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present SIU flow rate.

* In Column (1), list what dilution ratio and/or 7Q10 value was used in your old/expired NPDES permit. In Column (2), list what dilution ration and/or 7Q10 value is presently being used in your new/reissued NPDES permit.

  The 7Q10 value is the lowest seven day average flow rate, in the river, over a ten year period. The 7Q10 value and/or dilution ratio used by EPA in your new NPDES permit can be found in your NPDES permit "Fact Sheet."

* In Column (1), list the safety factor, if any, that was used when your existing TBLLs were calculated.

* In Column (1), note how your bio-solids were managed when your existing TBLLs were calculated. In Column (2), note how your POTW is presently disposing of its biosolids and how your POTW will be disposing of its biosolids in the future.

ITEM II.

* List what your existing TBLLs are - as they appear in your current Sewer Use Ordinance (SUO).

ITEM III.

* Identify how your existing TBLLs are allocated out to your industrial community. Some pollutants may be allocated differently than others, if so please explain.

ITEM IV.

* Since your existing TBLLs were calculated, identify the following in detail:

  (1) if your POTW has experienced any upsets, inhibition, interference or pass-through as a result of an industrial discharge.

  (2) if your POTW is presently violating any of its current NPDES permit limitations - include toxicity.

ITEM V.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in pounds per day) received in the POTW's influent. Current sampling data is defined as data obtained over the last 24 month period.

  All influent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

* Based on your existing TBLLs, as presented in Item II., list in Column (2), for each pollutant the Maximum Allowable Headwork Loading (MAHL) values derived from an applicable environmental criteria or standard, e.g. water quality, sludge, NPDES, inhibition, etc. For more information, please see p.,3-28 in EPA's *Guidance Manual on the Development and Implementation of Local Limits Under the Pretreatment Program, 12/87*.

Item VI.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in micrograms per liter) present your POTW's effluent. Current sampling data is defined as data obtained during the last 24 month period. All effluent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

* List in Column (2A) what the Water Quality Standards (WQS) were (in micrograms per liter) when your TBLLs were calculated, please note what hardness value was used at that

time. Hardness should be expressed in milligram per liter of Calcium Carbonate.

List in Column (2B) the current WQSs or "Chronic Gold Book" values for each pollutant multiplied by the dilution ratio used in your new/reissued NPDES permit. For example, with a dilution ratio of 25:1 at a hardness of 25 mg/l - Calcium Carbonate (copper's chronic WQS equals 6.54 ug/l) the chronic NPDES permit limit for copper would equal 156.25 ug/l.

ITEM VII.

* In Column (1), list all pollutants (in micrograms per liter) limited in your new/reissued NPDES permit. In Column (2), list all pollutants limited in your old/expired NPDES permit.

ITEM VIII.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants in your POTW's biosolids. Current data is defined as data obtained during the last 24 month period. Results are to be expressed as total dry weight.

  All biosolids data collected and analyzed must be in accordance with 40 CFR §136.

  In Column (2A), list current State and/or Federal sludge standards that your facility's biosolids must comply with. Also note how your POTW currently manages the disposal of its biosolids. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria will be and method of disposal.

In general, please be sure the units reported are correct and all pertinent information is included in your evaluation. If you have any questions, please contact your pretreatment representative at EPA - New England.

REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS (TBLLs)

POTW Name & Address : _____

NPDES PERMIT # : _____

Date EPA approved current TBLLs : _____

Date EPA approved current Sewer Use Ordinance : _____

ITEM I.

In Column (1) list the conditions that existed when your current TBLLs were calculated. In Column (2), list current conditions or expected conditions at your POTW.		
	Column (1) EXISTING TBLLs	Column (2) PRESENT CONDITIONS
POTW Flow (MGD)		
Dilution Ratio or 7Q10 (from NPDES Permit)		
SIU Flow (MGD)		
Safety Factor		N/A
Biosolids Disposal Method(s)		

ITEM II.

EXISTING TBLLs			
POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)	POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)

ITEM III.

Note how your existing TBLLs, listed in Item II., are allocated to your Significant Industrial Users (SIUs), i.e. uniform concentration, contributory flow, mass proportioning, other. Please specify by circling.

ITEM IV.

Has your POTW experienced any upsets, inhibition, interference or pass-through from industrial sources since your existing TBLLs were calculated?

If yes, explain.

_____

_____

Has your POTW violated any of its NPDES permit limits and/or toxicity test requirements?

If yes, explain. _____

_____

ITEM V.

Using current POTW influent sampling data fill in Column (1). In Column (2), list your Maximum Allowable Headwork Loading (MAHL) values used to derive your TBLLs listed in Item II. In addition, please note the Environmental Criteria for which each MAHL value was established, i.e. water quality, sludge, NPDES etc.				
Pollutant	Column (1) Influent Data Analyses Maximum (lb/day)	 Average (lb/day)	Column (2) MAHL Values (lb/day)	 Criteria
Arsenic				
Cadmium				
Chromium				
Copper				
Cyanide				
Lead				
Mercury				
Nickel				
Silver				
Zinc				
Other (List)				

ITEM VI.

Using current POTW effluent sampling data, fill in Column (1). In Column (2A) list what the Water Quality Standards (Gold Book Criteria) were at the time your existing TBLLs were developed. List in Column (2B) current Gold Book values multiplied by the dilution ratio used in your new/reissued NPDES permit.

Pollutant	Column (1) Effluent Data Analyses		Columns (2A) (2B) Water Quality Criteria (Gold Book)	
	Maximum (ug/l)	Average (ug/l)	From TBLLs (ug/l)	Today (ug/l)
Arsenic				
*Cadmium				
*Chromium				
*Copper				
Cyanide				
*Lead				
Mercury				
*Nickel				
Silver				
*Zinc				
Other (List)				

*Hardness Dependent (mg/l - CaCO3)

ITEM VII.

In Column (1), identify all pollutants limited in your new/reissued NPDES permit. In Column (2), identify all pollutants that were limited in your old/expired NPDES permit.			
Column (1) NEW PERMIT Pollutants	Limitations (ug/l)	Column (2) OLD PERMIT Pollutants	Limitations (ug/l)

ITEM VIII.

Using current POTW biosolids data, fill in Column (1). In Column (2A), list the biosolids criteria that was used at the time your existing TBLLs were calculated. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria would be and method of disposal.

Pollutant	Column (1) Biosolids Data Analyses Average (mg/kg)	Columns (2A) Biosolids Criteria From TBLLs (mg/kg)	(2B) Biosolids Criteria New (mg/kg)
Arsenic			
Cadmium			
Chromium			
Copper			
Cyanide			
Lead			
Mercury			
Nickel			
Silver			
Zinc			
Molybdenum			
Selenium			
Other (List)			

ATTACHMENT D

NPDES PERMIT REQUIREMENT FOR INDUSTRIAL PRETREATMENT ANNUAL REPORT

The information described below shall be included in the pretreatment program annual reports:

1. An updated list of all industrial users by category, as set forth in 40 C.F.R. 403.8(f)(2)(i), indicating compliance or noncompliance with the following:
   - baseline monitoring reporting requirements for newly promulgated industries
   - compliance status reporting requirements for newly promulgated industries
   - periodic (semi-annual) monitoring reporting requirements,
   - categorical standards, and
   - local limits;

2. A summary of compliance and enforcement activities during the preceding year, including the number of:
   - significant industrial users inspected by POTW (include inspection dates for each industrial user),
   - significant industrial users sampled by POTW (include sampling dates for each industrial user),
   - compliance schedules issued (include list of subject users),
   - written notices of violations issued (include list of subject users),
   - administrative orders issued (include list of subject users),
   - criminal or civil suits filed (include list of subject users) and,
   - penalties obtained (include list of subject users and penalty amounts);

3. A list of significantly violating industries required to be published in a local newspaper in accordance with 40 C.F.R. 403.8(f)(2)(vii);

4. A narrative description of program effectiveness including present and proposed changes to the program, such as funding, staffing, ordinances, regulations, rules and/or statutory authority;

5. A summary of all pollutant analytical results for influent, effluent, sludge and any toxicity or bioassay data from the wastewater treatment facility. The summary shall include a comparison of influent sampling results versus threshold inhibitory concentrations for the Wastewater Treatment System and effluent sampling results versus water quality standards. Such a comparison shall be based on the sampling program described in the paragraph below or any similar sampling program described in this Permit.

At a minimum, annual sampling and analysis of the influent and effluent of the Wastewater Treatment Plant shall be conducted for the following pollutants:

a.) Total Cadmium	f.) Total Nickel
b.) Total Chromium	g.) Total Silver
c.) Total Copper	h.) Total Zinc
d.) Total Lead	i.) Total Cyanide
e.) Total Mercury	j.) Total Arsenic

The sampling program shall consist of one 24-hour flow-proportioned composite and at least one grab sample that is representative of the flows received by the POTW. The composite shall consist of hourly flow-proportioned grab samples taken over a 24-hour period if the sample is collected manually or shall consist of a minimum of 48 samples collected at 30 minute intervals if an automated sampler is used. Cyanide shall be taken as a grab sample during the same period as the composite sample. Sampling and preservation shall be consistent with 40 CFR Part 136.

6. A detailed description of all interference and pass-through that occurred during the past year;

7. A thorough description of all investigations into interference and pass-through during the past year;

8. A description of monitoring, sewer inspections and evaluations which were done during the past year to detect interference and pass-through, specifying parameters and frequencies;

9. A description of actions being taken to reduce the incidence of significant violations by significant industrial users; and,

10. The date of the latest adoption of local limits and an indication as to whether or not the permittee is under a State or Federal compliance schedule that includes steps to be taken to revise local limits.

Attachment E

Summary of Reports Required by NPDES Permit No. NH0100170[1]

Report	Date Due	Submit Report to EPA at:[2]	Submit Report to State at:[2]
Discharge Monitoring Report (DMR) (Part I)	Monthly, by the 15th day of the following month.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
WET Test Report (Part I.A.1.)	The 15th day of the month following the end of the calendar quarter sampled.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Nine Minimum Controls Program Update (Part I.B.1.)	One-time submission, due within 12 months of the effective date	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095

[1]This table is a summary of the reports required to be submitted under this NPDES permit, and is included in the permit to serve as an aide to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.
[2]See Part I. for electronic (NetDMR) reporting requirements

Attachment E[1] (Continued)

Report	Date Due	Submit Report to EPA at[2]:	Submit Report to State at[2]:
Nine Minimum Controls Annual Report (Part I.B.4.)	Annually, by March 1st	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Sludge Report (Part I.H.)	Annually, by February 19th	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Collection System Map (Part I.E.4.)	Within 30 months of the effective date of the permit.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Collection System O&M Plan (Part I.E.5.)	Within 6 months of the effective date of the permit. Full plan due within 24 months from the effective date.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095

[1]This table is a summary of the reports required to be submitted under this NPDES permit, and is included in the permit to serve as an aide to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.
[2]See Part I. for electronic (NetDMR) reporting requirements

Attachment E[1] (Continued)

Report	Date Due	Submit Report to EPA at[2]:	Submit Report to State at[2]:
Collection O&M Plan Annual Report (Part I.E.6.)	Annually, by March 31st.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Reassessment of Technically Based Industrial Discharge Limits	Within 90 days of the effective date of the permit.	Justin Pimpare Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
. Pretreatment Program Annual Report (Part I.G.)	Annually, by March 1st	Justin Pimpare Environmental Protection Agency P.O. Box 8127 Boston, Massachusetts 02114	
Pretreatment Program Update (Part I.G.)	Within 180 days of the effective date of the permit	Justin Pimpare Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	

[1]This table is a summary of the reports required to be submitted under this NPDES permit, and is included in the permit to serve as an aide to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.
[2]See Part I. for electronic (NetDMR) reporting requirements

Attachment E[1] (Continued)

Report	Date Due	Submit Report to EPA at[2]:	Submit Report to State at[2]:
Sewer Use Ordinance, List of all significant indirect dischargers , List of all permitted indirect (Part I.G.8)	No less than every 5 years.	NA	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Monthly Operating Report Forms (MORs) (Part I.I.9.)	Monthly, by the 15th day of the following month.	NA	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095

[1]This table is a summary of the reports required to be submitted under this NPDES permit, and is included in the permit to serve as an aide to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.
[2]See Part I. for electronic (NetDMR) reporting requirements

NPDES PART II STANDARD CONDITIONS
(January, 2007)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

Note: See 40 CFR §122.41(a)(2) for complete “Duty to Comply” regulations.

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this permit.

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including "sludge-only facilities"), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or permittee;
(2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).

c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Paragraphs B.4.c. and 4.d. of this section.

c. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
(3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.
ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. Upset

a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated;
(3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
(4) The permittee complied with any remedial measures required under B.3. above.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by

imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The permittee shall allow the Regional Administrator or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. Planned Changes. The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
(2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. Anticipated noncompliance. The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. Transfers. This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

incorporate such other requirements as may be necessary under the CWA. (See 40 CFR Part 122.61; in some cases, modification or revocation and reissuance is mandatory.)

d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. Twenty-four hour reporting.

(1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

(3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.

h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and Federal standards and limitations to which a “discharge”, a “sewage sludge use or disposal practice”, or a related activity is subject to, including “effluent limitations”, water quality standards, standards of performance, toxic effluent standards or prohibitions, “best management practices”, pretreatment standards, and “standards for sewage sludge use and disposal” under Sections 301, 302, 303, 304, 306, 307, 308, 403, and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in "approved States", including any approved modifications or revisions.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" measured during the calendar week divided by the number of "daily discharges" measured during the week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

(a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.

(c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

(d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the calendar day or any other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source", or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation (See "Point Source" definition).

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead

to a treatment works; and discharges through pipes, sewers, or other conveyances leading into privately owned treatment works.

This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Regional Administrator on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States", the waters of the "contiguous zone", or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under Section 304(b) of CWA to adopt or revise "effluent limitations".

EPA means the United States "Environmental Protection Agency".

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized

populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable "daily discharge" concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as "maximum concentration" or "Instantaneous Maximum Concentration" during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean "a value that shall not be exceeded" during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of "Maximum Daily Discharge" and "Average Daily Discharge" concentrations are specifically limited to the daily (24-hour duration) values.

Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribe organization, or a designated and approved management agency under Section 208 of the CWA.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program".

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants";

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source"; and

(d) Which has never received a finally effective NPDES permit for discharges at that "site".

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore rig or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR §§125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants", the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System".

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved" State.

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR §122.2).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D. D.C. 1979)); also listed in Appendix A of 40 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (b) not a "POTW".

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly Owned Treatment Works (POTW) means any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary Industry Category means any industry which is not a "primary industry category".

Section 313 water priority chemical means a chemical or chemical category which:

(1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);

(2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and

(3) satisfies at least one of the following criteria:

(i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
(ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
(iii) are pollutants for which EPA has published acute or chronic water quality criteria.

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets, raw materials used in food processing or production, hazardous substance designated under section 101(14) of CERCLA, any chemical the facility is required to report pursuant to EPCRA Section 313, fertilizers, pesticides, and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to Section 405(d) of the CWA, and is required to obtain a permit under 40 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants means any pollutant listed as toxic under Section 307 (a)(1) or, in the case of "sludge use or disposal practices" any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and wastewater from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a "treatment works treating domestic sewage", where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503.

Waste Pile means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

(1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

(2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 122.2,

classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved state programs, the Regional Administrator in conjunction with the State Director, because of the potential for sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Industrial wastewater is wastewater generated in a commercial or industrial process.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

Municipality means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management agency under section 208 of the CWA, as amended. The definition includes a special district created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is an individual, association, partnership, corporation, municipality, State or Federal Agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination or organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to:, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
ug/l	Microgram(s) per liter
WET	"Whole effluent toxicity" is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	"Chronic (Long-term Exposure Test) – No Observed Effect Concentration". The highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.
A-NOEC	"Acute (Short-term Exposure Test) – No Observed Effect Concentration" (see C-NOEC definition).
LC_{50}	LC_{50} is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I - NEW ENGLAND
5 POST OFFICE SQUARE, SUITE 100
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FACT SHEET

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

NPDES PERMIT NO: **NH0100170**

PUBLIC COMMENT PERIOD START AND END DATES: July 23, 2013 thru September 20, 2013

NAME AND ADDRESS OF THE APPLICANT:

City of Nashua
Sawmill Road
Nashua, New Hampshire 03060

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS

City of Nashua Wastewater Treatment Facility
Sawmill Road
Nashua, New Hampshire 03060

And from eight combined sewer overflows (CSOs) (discharge serial numbers 002 – 009 (See Attachment A for individual outfall locations)

RECEIVING WATERS: **Merrimack River (**Wastewater Treatment Facility (outfall # 001), CSOs # 002-005)

Nashua River (CSOs # 006-009)

CLASSIFICATION: **B**

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Figures and Attachments

I. PROPOSED ACTION

The City of Nashua, New Hampshire (the "City" or "permittee"), has applied to the United States Environmental Protection Agency ("EPA") for reissuance of its National Pollutant Discharge Elimination System ("NPDES") permit to discharge to the designated receiving waters.

The discharges are from the Nashua Wastewater Treatment Facility ("WWTF"), which is a publicly owned treatment works ("POTW") that is engaged in the collection and treatment of wastewater generated by the residents, businesses and industries in the City of Nashua and the Town of Hudson, New Hampshire as well as from eight combined sewer overflow discharge points ("CSOs"). According to information supplied in the NPDES application submitted by the permittee, the facility accepts and treats wastewater from 133 industrial dischargers (users), including 23 significant industrial users, and maintains an active pretreatment program. The facility also accepts approximately 375,000 gallons of septage annually.

The most recent NPDES permit was issued to the City on May 31, 2000 and expired on May 31, 2005. This permit has been administratively continued, as a complete application for permit reissuance was filed by the City in accordance with the Administrative Procedures Act (5 U.S.C. 558(c)) and 40 CFR § 122.6. This permit is hereafter referred to as the "2000 permit" or the "existing permit".

The draft permit, upon final issuance, shall supersede the 2000 permit.

II. TYPE OF FACILITY AND DISCHARGE LOCATIONS

1. Background

The original facility was constructed in 1959, underwent an expansion in 1974, was upgraded to secondary treatment in 1989, and upgraded again in 2000 to include anaerobic digestion. Ongoing construction projects include work to mitigate the discharge of untreated wastewater through the City's eight combined sewer overflow outfalls ("CSOs") into the Merrimack and Nashua Rivers, which are discussed in more detail below.

The Nashua WWTF has one outfall (outfall number 001) through which treated effluent is discharged to the Merrimack River (See Figure 1). Blended effluent, comprised of primary and secondary effluent, is also discharged through outfall 001 during wet weather events when the flow to the WWTF exceeds the plant's secondary treatment capacity, as described below. The City also owns and operates a CSO treatment facility (Wet Weather Flow Treatment Facility, or "WWFTF"), located adjacent to the wastewater treatment facility. The discharge from this facility combines with secondary effluent (as well as combined secondary and primary effluents, when the secondary treatment process is bypassed) from the WWTF in the chlorine contact tank and is discharged through outfall 001. The operation of this facility is described in the *Wet Weather Flow* section.

Discharges of combined sanitary wastewater and stormwater occur from the eight combined sewer overflow discharge outfalls identified in Attachment A when the hydraulic capacity of the wastewater treatment facility/collection system becomes overloaded during storm events. A second CSO treatment facility is expected to commence operation within the next few years. This facility will provide screening and disinfection to combined flows which currently discharge through CSO outfalls #005 and #006. Flows from this facility will discharge to the Merrimack River. These discharges are discussed in further detail in Part VIII of this fact sheet

2. Treatment Process

The Nashua WWTF uses an activated sludge process to provide secondary treatment to wastewater flows up to its 16 million gallons per day (MGD) annual average design flow capacity and up to its peak flow capacity of 38 MGD. A description of the normal dry weather flow operation of the treatment plant is included immediately below. A process diagram is shown in Figure 2. Facility operations during wet weather events are described later in this section and a corresponding schematic is shown in Figure 3.

Dry Weather Flow

Influent flows enter the treatment works through the main influent wet well, where larger solids and debris are removed by bar screens to minimize the potential for such objects to damage equipment farther along the process train. The materials removed are washed and conveyed to a closed top container for disposal. Flows are monitored by ultrasonic flow sensors, which relay the data to the Supervisory Control and Data Acquisition (SCADA) system and are then conveyed to the grit removal building by a force main. Inside the grit chambers, the introduction of coarse bubble aeration serves to decrease the flow velocity, which in turn allows for the settling of large inorganic solids and coarse debris. The settled material is washed and loaded into trucks for disposal at the City's landfill.

Next, the wastewater flows to primary sedimentation basins where the floatable (oil and grease) and settleable solids (sludge) are removed. The floatable solids are directed to a storage tank for disposal and the sludge is pumped to gravity thickeners. The primary effluent flows to the aeration basins, where it comes into contact with activated sludge, which consists of a mixture of biological organisms. Aeration of the wastewater facilitates the growth of aerobic bacteria, which reduce the organic load in the wastewater by converting it to energy and biomass. The wastewater then flows to the secondary clarifiers where suspended material (bacteria and remaining solids) settle out from the liquid portion of the wastewater (effluent). Floatable solids are removed by a rake arm and are pumped back to the head of the aeration basins. The settled material, which forms sludge at the bottom of the clarifiers, is collected by rotating rake arms. Most of the collected sludge is pumped back to the aeration tanks as return activated sludge ("RAS") to maintain biological treatment; a smaller portion is pumped to a holding tank for disposal (waste activated sludge, or "WAS"). From the secondary clarifiers, the treated effluent flows into the chlorine contact chambers where liquid sodium hypochlorite is added to kill any pathogenic organisms. A sample of the effluent is continuously analyzed, and the disinfected

effluent is dechlorinated with a sodium metabisulfite solution prior to discharge. The effluent cascades to the outfall chamber and is discharged to the Merrimack River through outfall 001.

Solids Handling

The sludges created during the primary and secondary treatment processes are thickened by gravity thickeners and belt thickeners, respectively, to reduce the water content. The thickened sludge is then sent to the anaerobic digester complex. The hydraulic retention time in the 1.3 million gallon egg-shaped primary digester is approximately 20 days. During this time, the solids are further broken down into carbon dioxide, water and methane gas. The methane is sent to a generator to produce electricity and to a boiler to produce heat for the digestion process. The digested biosolids are then sent to three belt filter presses for dewatering, and are then loaded into trucks for distribution to farms within the state for use as a soil enhancer.

Wet Weather Flow

During wet weather events, flows up to 50 MGD are conveyed to the headworks of the wastewater treatment plant, with 38 MGD receiving full secondary treatment. The additional flow (up to 12 MGD) bypasses the secondary treatment process, receiving primary treatment before blending with secondary effluent for disinfection and dechlorination prior to being discharged through outfall 001, as discussed in further detail below.

The bypass of secondary treatment during wet weather events is considered an interim measure to control discharges of untreated wastewater through CSOs per the Consent Decree which was lodged in 2005 (see Part VIII.A. of this fact sheet for further discussion of the Consent Decree)[1]. Use of this bypass is governed by the terms of the 2005 Consent Decree, which establishes conditions, monitoring requirements and effluent limitations.

Wet weather related flows that exceed the 50 MGD primary treatment capacity of the WWTF are diverted to a 60 MGD Wet Weather Flow Treatment Facility (WWFTF), which is located adjacent to the main wastewater treatment plant and commenced operation in 2009. The Wet Weather Flow Treatment Facility effectively expanded the City's wet weather treatment capacity to 110 MGD, in accordance with the 2010 High Flow Management Plan.

Flow is diverted to the Wet Weather Flow Treatment Facility when the main influent gate to the wastewater treatment facility is lowered. This typically occurs automatically when the flow rate through the main gate reaches 50 MGD. The lowering of the main influent gate activates a diversion structure located on the 72" North Merrimack interceptor. A 60 MGD pumping

[1] CSO-related bypass of treatment during wet weather may not be authorized in NPDES permits until a long term control plan has been approved by EPA and other conditions are met. Interim approval of a CSO-related bypass may be accomplished through an administrative order which outlines the conditions under which a bypass of secondary treatment may be operated (CSO Control Policy, Federal Register, Vol. 59, No. 75, April 19, 1994. Also see 40 CFR 122.41(m)). The conditions under which bypasses of secondary treatment at the Nashua WWTF may occur are prescribed in the City's High Flow Management Plan, dated 2010, per the 2005 Consent Decree.

facility, which includes a screening facility to protect downstream equipment from being damaged by large objects and coarse debris, pumps the excess flows to the Wet Weather Flow Treatment Facility, which uses a ballasted flocculation process and consists of two 30 MGD treatment trains. The treatment process utilizes polymers in conjunction with micro sand to form a quick-settling floc. The effluent from the WWFTF is then blended with primary and secondary effluent in the wastewater treatment plant's chlorine contact chamber for disinfection prior to being discharged to the Merrimack River through outfall 001.

The solids removed during the treatment process undergo vortex separation to recover the micro sand used in the ballasted flocculation process. Any remaining sludge is thickened and introduced into the existing sludge process train, including blending with primary and secondary thickened sludges.

III. DESCRIPTION OF THE DISCHARGE

A quantitative description of the discharge from outfall 001, in terms of significant effluent parameters based on monitoring data submitted by the permittee from 2007-2012, can be found in Attachment D of this fact sheet. This data represents the quality of secondary effluent as well as combined effluent, which consists of a combination of secondary, primary, and WWFTF effluents.

As described earlier, the facility also experiences wet weather-related bypasses of secondary treatment, not authorized under the existing permit, that are provided with primary treatment and are then combined with secondary effluent ("combined effluent") for disinfection prior to discharge. Monitoring data of combined effluent is reported pursuant to a 2005 Consent Decree (*United States v. City of Nashua*, Civil Action No. 05-376-PB (December 2005, as amended)). Monitoring results for combined effluent from 2009-2011 are shown in Attachment E.

Annual discharge volumes from the City's combined sewer overflow outfalls from 2009-2011 are provided in Attachment F.

IV. LIMITATIONS AND CONDITIONS

The draft permit contains effluent limitations for outfall serial number 001 (WWTF outfall), including limits on 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), pH, *Escherichia coli* (*E. coli*), total residual chlorine, total recoverable lead, total recoverable copper, total phosphorus and whole effluent toxicity ("WET"); as well as monitoring requirements for hardness, ammonia nitrogen, alkalinity; and total recoverable aluminum, cadmium, copper, nickel, lead, and zinc. Additionally, the draft permit includes limitations and conditions authorizing discharges from CSOs, the Wet Weather Flow Treatment Facility and the future Screening and Disinfection Facility. These proposed limitations and conditions, which are discussed in further detail throughout this fact sheet, can be found in Part I, Sections A and B, of the draft permit.

V. STATUTORY AND REGULATORY AUTHORITY

A. General Statutory and Regulatory Background

Congress enacted the Clean Water Act ("CWA" or, the "Act") "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (CWA § 101(a)). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into waters of the United States from any point source, except as authorized by specified permitting sections of the CWA, one of which is Section 402 (see CWA §§ 301(a) and 402(a)). Section 402 establishes one of the CWA's principal permitting programs, the National Pollutant Discharge Elimination System ("NPDES"). Under this section of the CWA, EPA may "issue a permit for the discharge of any pollutant or combination of pollutants" in accordance with certain conditions (see CWA § 402(a)). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements (see CWA § 402(a)(1) and (2)).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits, technology-based effluent limitations and water quality-based effluent limitations (see CWA §§ 301, 303, and 304(b)). Also see 40 CFR Parts 122, 125, and 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted (see CWA §301(b)). As a class, POTWs must meet performance-based requirements which are based upon secondary treatment. The secondary treatment technology guidelines (effluent limits) consist of effluent limitations for BOD_5, TSS, and pH (see 40 CFR Part 133). Water quality-based effluent limitations are developed and incorporated into NPDES discharge permits to ensure that state water quality standards are met regardless of the decision made with respect to technology and economics in establishing technology-based limits. In particular, Section 301(b)(1)(C) of the CWA requires achievement of "any more stringent limitation, including those necessary to meet water quality standards…established pursuant to any state law or regulation…" See 40 CFR §§ 122.4(d) and 122.44(d)(1) (providing that a permit must contain effluent limits as necessary to protect State water quality standards, "including State narrative criteria for water quality") (emphasis added) and 40 CFR § 122(45)(d)(5) (providing in part that a permit incorporate any more stringent limits required by Section 301(b)(1)(C) of the CWA). Under Section 301(b)(1) of the CWA, POTWs must have achieved effluent limitations based upon secondary treatment by July 1, 1977. Since all statutory deadlines for meeting technology-based effluent limitations established pursuant to the CWA have expired, the deadline for compliance with technology-based effluent limits for a POTW is the date of permit issuance (40 CFR § 125.3(a)). Extended compliance deadlines cannot be authorized by a NPDES permit if statutory deadlines have passed.

The CWA requires that states develop water quality standards for all water bodies within the state (see CWA § 303). Water quality standards consist of three elements: (1) one or more designated use for each waterbody or waterbody segment in the state; (2) water quality criteria consisting of numerical concentration levels and/or narrative statements specifying the amounts of various pollutants that may be present in each waterbody without impairing the designated use(s) of that waterbody; and (3) an antidegradation provision focused on protecting high quality

waters and protecting and maintaining the level of water quality necessary to protect existing uses (CWA § 303(c)(2)(a) and 40 CFR § 131.12). The limits and conditions contained within the draft permit reflect the goal of the CWA and EPA to achieve and then to maintain water quality standards within the receiving water. The applicable state water quality standards can be found in the New Hampshire Surface Water Quality Regulations, Chapter Env-Wq 1700 et seq. See generally, Title 50, Water Management and Protection, Chapter 485A, Water Pollution and Waste Disposal, Section 485-A. The New Hampshire Surface Water Quality Regulations are hereinafter referred to as the "NH Standards".

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from a state's water quality standards to develop permit limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable instream pollutant concentrations. Acute and chronic aquatic life criteria are generally implemented through maximum daily limits and average monthly limits, respectively. When a state has not established a numeric water quality criterion for a specific pollutant that is present in the effluent in a concentration that causes or has the reasonable potential to cause or contributes to a violation of a narrative criterion within a water quality standard, the permitting authority must establish limits in one or more of the following ways: (1) based on a calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated uses; (2) on a case-by-case basis using water quality criteria published under CWA § 304(a), supplemented as necessary by other relevant information; or (3) in certain circumstances, based on an indicator parameter (40 CFR § 122.44(d)(1)(vi)(A-C)).

The federal regulations governing EPA's NPDES program are generally found at 40 CFR Parts 122, 124, and 136.

B. Development of Water Quality-based Effluent Limitations

Pursuant to 40 CFR § 122.44(d)(1), NPDES permits must contain any requirements in addition to technology-based limits necessary to achieve water quality standards established under Section 303 of the CWA. In addition, limitations "must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality" (40 CFR § 122.44(d)(1)(i)). An excursion occurs if the actual or projected instream concentration exceeds the applicable criterion.

1. Reasonable Potential

In determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion above a narrative or numeric criterion within a state water quality standard, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) the variability of the pollutant or pollutant parameter in the effluent; (3) the sensitivity of the

species to toxicity testing; (4) where appropriate, the dilution of the effluent in the receiving water; and (5) the statistical approach outlined in the *Technical Support Document for Water Quality-based Toxics Control*, Section 3 (USEPA, March 1991 [EPA/505/2-90-001])(see also 40 CFR § 122.44(d)(1)(ii)). In accordance with New Hampshire's Water Quality Standards (RSA 485-A:8 VI, Env-Wq 1705.02), the available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10 flow) for aquatic life and human health criteria for non-carcinogens, or the long-term harmonic mean flow for human health (for carcinogens only) in the receiving water at the point just upstream of the outfall. Furthermore, ten percent of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations (Env-Wq 1705.01).

C. Antibacksliding

Section 402(o) of the CWA generally provides that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. EPA has also promulgated anti-backsliding regulations, which are found at 40 CFR § 122.44(l). Unless applicable anti-backsliding requirements are met, the limits and conditions in the reissued permit must be at least as stringent as those in the previous permit. The limitations and conditions contained within the draft permit satisfy the antibacksliding requirements of 40 CFR § 122.44(l).

D. State Certification

Section 401(a)(1) of the CWA requires all NPDES permit applicants to obtain a certification from the appropriate state agency stating that the permit will comply with all applicable federal effluent limitations and state water quality standards. See CWA § 401(a)(1). The regulatory provisions pertaining to state certification provide that EPA may not issue a permit until a certification is granted or waived by the state in which the discharge originates (40 CFR § 124.53(a)). The regulations further provide that, "when certification is required…no final permit shall be issued…unless the final permit incorporated the requirements specified in the certification under § 124.53(e)" (40 CFR § 124.55(a)(2)).

VI. DESCRIPTION OF THE RECEIVING WATER

CSO outfalls #006-009 discharge into the Nashua River, which flows into the Merrimack River, with CSO outfall #008 being located the farthest upstream from the confluence of the Nashua and Merrimack Rivers. The Nashua WWTF (outfall 001) and CSOs #002-005 discharge to the Merrimack River, downstream from the confluence with the Nashua River. The Merrimack River flows for approximately 2.9 miles from the farthest CSO outfall (CSO outfall #003) to the Massachusetts border. The locations and relations of the CSO outfalls and WWTF to one another are shown in Figure 4.

Both the Nashua and Merrimack Rivers are classified by the State of New Hampshire as Class B waters. Class B waters shall be of the second highest quality and shall have no objectionable

physical characteristics, and shall contain a dissolved oxygen content of at least 75 percent saturation (see RSA 485-A:8). The following designated uses apply to Class B waters: the protection and propagation of aquatic life and wildlife, for swimming and other recreational purposes; and, after treatment, for water supplies (RSA 485-A:8).

Sections 305(b) and 303(d) of the CWA require that States complete a water quality inventory and develop a list of impaired waters. Specifically, Section 303(d) of the CWA requires States to identify those water bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls, and as such, require the development of a Total Maximum Daily Load (TMDL) for each pollutant that is prohibiting a designated use(s) from being attained. The results of the 305(b) assessments are used in the development of the State of New Hampshire's 303(d) lists, which are published every two years and identify the water bodies which are not meeting (or are not expected to meet) water quality standards, identify the designated use(s) which is impaired and also the pollutant(s) causing the impairment(s).

The segment of the Merrimack River into which the Nashua WWTF and the CSOs discharge (Assessment Unit ID: NHRIV700061206-24) is identified in the *State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (NHDES 2010) as not meeting the following designated uses (i.e., the uses are impaired and require the development of a TMDL for the identified causes of the impairment(s)): (1) aquatic life use for aluminum and pH; (2) primary contact recreation use for chlorophyll-a and *Escherichia coli* (*E. coli*); and (4) secondary contact recreation use for *E. coli*.

The segments of the Nashua River into which CSOs # 007 and #008 discharge (Assessment Unit ID: NHRIV700040402-08), and CSOs # 006 and #009 discharge (Assessment Unit ID: NHRIV700040402-09), as well and the intervening segment (Assessment Unit ID: NHIMP700040402-05) are not meeting the following designated uses, as identified in the *State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (NHDES 2010), as follows: (1) primary contact recreation use for *E. coli* and (2) secondary contact recreation use for *E. coli (*segment NHRIV700040402-08 only).

CSOs are listed as the source of the pollutant causing impairment of the primary contact designated use in the segments of the Merrimack and Nashua Rivers affected by the CSOs. A TMDL for the Merrimack and Nashua Rivers for *E. coli* has been completed (2010) and the requirements in the draft permit are consistent with the TMDL. TMDLs for the Merrimack River are scheduled to be completed as follows: aluminum-2019, pH-2016 and chlorophyll-a- 2019 (*See State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (NHDES 2010)).

With respect to the pollutants identified as causing or contributing to impairments of designated uses for which a TMDL has yet to be developed, EPA is required to use available information to establish water quality-based limits when issuing NPDES permits to facilities which discharge to impaired waters. See generally 40 CFR §122.44 (d).

The Nashua WWTF (outfall 001) and CSOs #002-005 discharge to the last segment of the Merrimack River in New Hampshire. Therefore, the impacts of the discharges from the Nashua's WWTF and CSOs on the quality of the Merrimack River in Massachusetts were also considered during the development of the draft permit. The first segment of the Merrimack River in Massachusetts (segment 84A-01) is listed as impaired due to metals and pathogens in the final *Massachusetts Year 2010 Integrated List of Waters* (MassDEP 2010), which includes the 303(d) listing of waters not meeting or expected to meet water quality standards.

Based on the most current information available, EPA believes that the limitations and conditions contained in the draft permit represent the minimum level of control necessary to ensure protection of all designated uses in the receiving waters.

VII. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. Flow

The annual (long-term) average design flow of the Nashua WWTF (16 MGD) was used to determine the available dilution, which was used to calculate effluent limitations for total residual chlorine and whole effluent toxicity as well as the mass-based limits for BOD_5 and TSS, in accordance with the requirements found at 40 CFR § 122.45(b).

The draft permit maintains the requirement in the 2000 permit for the permittee to submit to EPA and NHDES a projection of loadings, a program for maintaining satisfactory treatment levels, and plans for facility improvements whenever the effluent flow exceeds 80 percent of the facility's design flow capacity (12.8 MGD) for three consecutive months. The draft permit also maintains the average monthly and maximum daily flow reporting requirements in the 2000 permit.

B. Conventional Pollutants

1. Five-Day Biochemical Oxygen Demand (BOD5) and Total Suspended Solids (TSS)

The average monthly and average weekly effluent limitations for BOD_5 and TSS of 30 mg/l and 45 mg/l, respectively in the draft permit are based on the secondary treatment regulations for POTWs found at 40 CFR § 133.102(a) and (b). The 50 mg/l maximum daily limitations for BOD_5 and TSS in the existing permit, which were based on state certification requirements, have been maintained in the draft permit. The draft permit also contains average monthly (4006 lbs/day), average weekly (6008 lbs/day), and maximum daily (6676 lbs/day) mass-based limits for BOD_5 and TSS, in accordance with the requirements of 40 CFR § 122.45(f). See Attachment C for the equations used to calculate these mass-based limits**.**

The draft permit also carries forth the requirement in the 2000 permit for obtaining an 85% reduction of BOD_5 and TSS, in accordance with the requirements of 40 CFR § 133.102(a)(4)(iii).

The provisions of 40 CFR § 133.103(a) allows for the application of an exception to the 85% BOD_5 and TSS removal requirement in the event that a treatment works receiving flow from combined sewers is not able to achieve this level of BOD_5 and TSS reduction during wet weather events. Achieving such reductions is difficult during such periods when influent flows are diluted and the secondary treatment capacity at the plant is exceeded.

Therefore, an exception to the 85% BOD_5 and TSS removal requirement during wet weather events has been incorporated into the draft permit in accordance with 40 CFR § 133.103(a). Specifically, the draft permit requires that the 30-day average percent removal of BOD_5 and TSS be no less than 85% during periods of dry weather, which is defined as any calendar day on which there is less than 0.1 inch of rainfall and no snow melt.

The limitations and requirements pertaining to BOD_5 and TSS in the draft permit are the same as those in the existing permit and are therefore consistent with the antibacksliding requirements of 40 CFR § 122.44(l).

2. pH

The limitation for pH in the draft permit is based on the State's water quality standards for Class B waters established at RSA 485-A:8 II, requiring that "The pH range for said (Class B) waters shall be 6.5-8.0 except when due to natural causes" and is required by the state as a condition for obtaining state certification. The pH limitation in the draft permit is the same as that in the existing permit in keeping with the antibacksliding requirements of 40 CFR § 122.44(l) and is at least as stringent as the requirements of 40 CFR § 133.102(c).

The special condition in the 2000 permit, which allows for a change in the pH limitation to outside of the range of 6.5 to 8.0 Standard Units (SU) upon meeting certain conditions, has not been included in the draft permit because of the listing of the aquatic life designated use for the segment of the Merrimack River in the vicinity of the discharge as impaired due to pH in the *State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (NHDES 2010)).

3. *Escherichia coli (E. coli)*

The limitations for *E. coli* at outfall 001 in the draft permit are an average monthly limit of 126 colonies per 100 milliliters (ml) and a maximum daily limit of 406 colonies per 100 ml. These limitations are based on requirements in the State's Statutes for Class B waters (non-designated beach areas) found at RSA 485-A:8 II, and Env-Wq 1703.06 (b), which requires that bacteria criteria shall be applied at the end of a wastewater treatment facility's discharge pipe.

The average monthly value shall be reported as the geometric mean of the sampling results for the reporting month. The draft permit requires the concurrent collection of *E. coli* and total residual chlorine samples. Compliance with the average monthly value shall be determined from the reported geometric mean. These limitations are identical to those in the existing permit in keeping with the anti-backsliding requirements of 40 CFR § 122.44(l).

C. Non-conventional and Toxic Pollutants

Water quality-based effluent limitations for specific toxic pollutants are based on numeric chemical-specific criteria derived from extensive scientific studies. EPA has summarized and published toxicity criteria for specific toxic pollutants in the *Quality Criteria for Water* (USEPA 1986 [EPA440/5-86-001]), commonly referred to as the "Gold Book". The Gold Book includes acute aquatic life criteria (to protect against the effects of short-term exposure, such as death) and chronic aquatic life criteria (to protect against the effects of long-term exposure, such as impaired growth). The State of New Hampshire adopted the Gold Book criteria (with certain exceptions) into the state's surface water quality regulations on December 3, 1999 (see Env-Wq 1703.21). EPA uses the pollutant-specific criteria contained within the Gold Book (and adopted by the State of New Hampshire) along with the available dilution in the receiving water and other relevant information in the development of pollutant-specific water quality-based effluent limitations.

7Q10 Flow and Available Dilution

Water quality-based effluent limitations are established using a calculated dilution factor that represents the available dilution in the receiving water at the point of discharge. The dilution factor is derived from the design flow of the facility and the annual seven consecutive day mean low flow of the receiving water with a recurrence interval of once in every ten years ("7Q10 flow") (see Env-Wq 1702.44). In calculating water quality-based effluent limitations, the available dilution is reduced by 10% to account for the State's assimilative capacity reserve rule (see Env-Wq 1705.01).

The dilution factor used in the development of the 2000 permit was 28.0, which was based on an estimate of the 7Q10 flow at outfall 001 of 745.8 cubic feet per second (cfs) and the design flow of the facility, 16 mgd (24.8 cfs). The 7Q10 flow value was determined from flow measurements in the Merrimack River and estimates of the drainage basin area above the outfall.

For this draft permit, the dilution factor was recalculated to be 28.5, based on a revised estimate of the 7Q10 flow at outfall 001 of 784.1 cfs.

The revised 7Q10 value at the point of discharge resulted from recalculated 7Q10s for the upstream U.S Geological Survey (USGS) gage at Goffs Falls, Manchester, NH, and for several downstream USGS gages using more recent periods of record. Also, rather than using the ratio of the drainage areas to estimate the 7Q10 for the intervening drainage area between the USGS gages and the outfall, the new 7Q10 estimate uses the ratio of the flows calculated using the empirical equation for estimating flows in ungaged streams developed by Dr. Lawrence S. Dingman of UNH (Dingman Ratio Proration Method or DRPM). The calculations supporting the revised 7Q10 flow estimate and the derivation of dilution factor are shown in Attachment B.

1. Total Residual Chlorine (TRC)

The New Hampshire water quality standards include freshwater chronic and acute aquatic-life criteria for chlorine which are established as 0.011 mg/l and 0.019 mg/l, respectively.

Chlorine and chlorine compounds, such as "organochlorines", produced by the chlorination of wastewater can be extremely toxic to aquatic life. Section 101(a)(3) of the Act, and the New Hampshire standards at Env-Wq 1703.21(a), prohibit the discharge of toxic pollutants in toxic amounts. Therefore, to reduce the potential for the formation of chlorinated compounds during the wastewater disinfection process and to be protective of the States' narrative standards, EPA-Region I has, historically, established a maximum Total Residual Chlorine (TRC) limitation of 1.0 mg/l for both the average monthly and the maximum daily limitations. These limitations may be more stringent, after considering the available dilution, than the limits determined using the State's numeric water quality criteria.

The average monthly and maximum daily limitations for total residual chlorine (TRC) in the 2000 permit (0.308 mg/l and 0.532 mg/l, respectively) were based upon the acute and chronic aquatic life criteria specified in the state's water quality standards and a dilution factor of 28.

The average monthly and maximum daily limits for TRC proposed in the draft permit are 0.31 mg/l and 0.54 mg/l, respectively. These limits are based on the revised dilution factor of 28.5, which reflects a 10% reduction in the available dilution to account for the State's assimilative capacity reserve rule (see Env-Wq 1705.01), and the acute and chronic aquatic life criteria for TRC specified in the State's water quality standards (19 µg/l and 11 µg/l, respectively [see Env-Wq. 1703.21, Table 1703.1]). These limits were calculated by multiplying the dilution factor by the criteria, as shown below.

Acute TRC Limit = 19 µg/l x 28.5 = 540 µg/l (0.54 mg/l)
Chronic TRC Limit = 11 µg/l x 28.5 = 314 µg/l (0.31 mg/l)

The draft permit requires the concurrent collection of total residual chlorine samples with *E. coli* samples.

2. Metals

The release of metals into surface waters from anthropogenic activities such as discharges from municipal waste water treatment facilities can result in their accumulation to levels that are highly toxic to aquatic life. Therefore, it is imperative to evaluate the downstream effects of discharges of metals from POTWs. The existing permit requires bimonthly effluent monitoring for copper. In addition, the existing permit requires concurrent analyses for aluminum, copper, lead, zinc, nickel, cadmium, and chromium on samples of the receiving water collected upstream from the discharge for use as dilution water in whole effluent toxicity (WET) tests, as well as on samples of the effluent, in conjunction with quarterly WET tests. The results of metals analyses conducted on samples of the effluent and upstream receiving water from 2007-2012 are shown in Attachment D.

The risk of toxicity associated with copper, lead, zinc, nickel, cadmium and chromium in freshwater systems are hardness-dependent, with an increase in water hardness resulting in a decrease in the toxicity of the metal. The water quality criteria for these metals accounts for this relationship and are specific to the hardness of the water in which the criteria are being applied (see Env-Wq 1703.21, Table 1703.1).

A downstream hardness value of 16 mg/l as $CaCO_3$ was determined by applying a median upstream hardness value of 14 mg/l as $CaCO_3$ and a median effluent hardness value of 65 mg/l as CaCO3, as reported in WET tests from 2007-2012 (Attachment D); the design flow of the facility and the receiving water 7Q10 flow to a mass balance equation. Since this downstream hardness is below 25 mg/l, a default value of 25 mg/l was used to determine the total recoverable metals criteria, in accordance with the New Hampshire Water Quality Standards (see Env-Wq 1703.22(f)). The factors used to determine the acute and chronic total recoverable criteria for each metal are presented in Table 1.

Table 1 Freshwater Metals Criteria (Total Recoverable)

Metal	Parameter				Total Recoverable Criteria	
	ma*	ba**	mc*	bc**	Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)
Aluminum	–	–	–	–	750	87
Cadmium	1.1280	-3.6867	0.7852	-2.7150	0.95	0.83
Chromium III	0.819	3.7256	0.819	0.6848	579.32	27.69
Copper	0.9422	-1.7000	0.8545	-1.702	3.79	2.85
Lead	1.273	-1.46	1.273	-4.705	13.98	0.54
Nickel	0.846	2.255	0.846	0.0584	145.21	16.14
Zinc	0.8473	0.884	0.8473	0.884	37.02	37.02

*Acute Criteria (CMC) = exp{ma*ln(hardness)+ba}
**Chronic Criteria (CCC) = exp{mc*ln(hardness)+bc}

Determining Reasonable Potential

The effluent was characterized using a statistical analysis of effluent metals data, as reported in monthly discharge monitoring reports and in WET tests from 2007-2012 (see Attachment D), to establish the 95th percentile of the lognormal distribution of the effluent data, which represents the maximum effluent concentration that can be expected to occur 95 percent of the time (i.e., the upper bound of the lognormal distribution of the data). These values are presented in Table 2. The statistical approach to characterizing the effluent is described in Attachment G.

As indicated in Table 2, the upper bound effluent concentrations of nickel, chromium, and aluminum are below the relevant criteria, even without accounting for any dilution provided by the receiving water (100% effluent), suggesting that reasonable potential does not exist for the discharge of these metals to cause or contribute to excursions above the criteria, and no further analysis is necessary. Although the segment of the Merrimack River into which outfall 001 discharges is not meeting the aquatic life designated use for aluminum (*State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (NHDES 2010)), EPA has determined that the discharge does not present reasonable potential to cause or contribute to this impairment, as the upper bound concentration of aluminum detected in samples of pure effluent from 2007-2012 is significantly less than both the chronic and acute criteria (see Table 2 and Appendix D).

In order to determine whether the effluent presents reasonable potential to cause or contribute to an exceedance above the in-stream water quality criteria for lead, copper, cadmium and zinc, the following mass balance equation, which accounts for ambient metals concentrations as reported in WET test reports submitted from 2007-2012 (see Appendix D), was used to project instream metal concentrations downstream from the discharge under 7Q10 flow conditions.

$$Q_d C_d + Q_S C_S = Q_r C_r$$

rewritten as:

$$C_r = (Q_d C_d + Q_s C_s)/Q_r$$

where:

C_r = resultant downstream metals concentration in ug/L
Q_d = effluent flow (design flow = 16 mgd = 24.75 cfs)
C_d = effluent metals concentration in ug/L (95th percentile)
Q_S = upstream 7Q10 flow (759.4 cfs)
C_S = median instream metals concentration, upstream from the discharge in ug/L
Q_r = 7Q10 flow just downstream from the discharge (784.1 cfs)

Reasonable potential is then determined by comparing this resultant in-stream concentration (for both acute and chronic conditions) with the criteria for each metal multiplied by the factor 0.9 to reserve 10% of the assimilative capacity of the receiving water in accordance with the requirements of Env-Wq 1705.01. If there is reasonable potential (the projected downstream concentration is greater than either an acute or chronic criterion multiplied by 0.9), the appropriate limit is then calculated by rearranging the above mass balance to solve for the effluent concentration (C_d) using the criterion multiplied by 0.9 as the resultant in-stream concentration (C_r). The results of these analyses are provided Table 2. An example reasonable potential determination is provided in Attachment H.

Table 2 Mass Balance Equations for Determining Reasonable Potential and Effluent Limitations

Metal	Qd	Cd[1] (95th Percentile)	Qs	Cs[2] (Median)	Qr = Qs + Qd	Cr[3] = (QdCd+QsCs) /Qr	Criteria * 0.9		Reasonable Potential	Limit[4] = (QrCr*0.9-QsCs)/Qd	
	cfs	ug/l	cfs	ug/l	cfs	ug/l	Acute (ug/l)	Chronic (ug/l)	Cr > Criteria	Acute (ug/l)	Chronic (ug/l)
Aluminum	24.75	52.51	759.4	81	784.1	NA	NA	NA	NA	N/A	NA
Cadmium		0.90		0		0.029	0.851	0.746	N	N/A	N/A
Chromium III		3.156		0		NA	NA	NA	NA	N/A	N/A
Copper		32.42		2		2.96	3.41	2.57	Y (chronic)	N/A	20.0
Lead		2.59		0.500		0.566	12.68	0.490	Y (chronic)	N/A	0.54[5]
Nickel		8.76		0		NA	NA	NA	NA	N/A	N/A
Zinc		125.54		9		12.68	33.31	33.31	N	N/A	N/A

[1]Values calculated from the results of metals analyses conducted on samples of the effluent in conjunction with whole effluent toxicity tests from 2007-2012 as well as the results of bi-monthly copper monitoring (see Attachment D).
[2]Median upstream data from analyses conducted on samples of the Merrimack River collected just upstream from the discharge for use as dilution water in Whole Effluent Toxicity (WET) tests from 2007-2012. (see Attachment D).
[3]Cr = instream metals concentration, downstream from the discharge
[4]Cr = Criteria * 0.9
[5]Establishing a limit equal to the criterion would be appropriate because the median upstream concentration exceeds 90% of this value.

As shown in the table above, reasonable potential exists for the discharge to cause or contribute to excursions above the chronic criteria for total recoverable copper and total recoverable lead, and limits for these metals are proposed in the draft permit.

However, there is no reasonable potential (under either acute or chronic conditions) that the discharge of aluminum, cadmium, chromium, nickel, or zinc will cause or contribute to an exceedance of applicable water quality criteria, and limitations for these metals are not included in the draft permit. The draft permit maintains the requirement in the existing permit for the monitoring for all of the aforementioned metals with the exception of chromium, as the current WET test protocol no longer requires its analysis. The results of copper and lead analyses conducted in conjunction with WET tests may be used to satisfy one of the twice per month monitoring requirements for copper and lead for the particular month in which the sampling is conducted.

3. Phosphorus

Phosphorus is both an essential and limiting nutrient in freshwater systems which, when present in excess quantities, stimulate plant productivity within the system. The excessive growth of aquatic plants and algae within freshwater systems negatively impacts water quality and can interfere with the attainment of designated uses by (1) increasing the oxygen demand within the water body (to support an increase in both plant respiration and the biological breakdown of dead organic (plant) matter); (2) causing an unpleasant appearance and odor; (3) interfering with navigation and recreation; (4) reducing water clarity; and (5) reducing the quality and availability of suitable habitat for aquatic life. Cultural (or accelerated) eutrophication is the term used to describe excessive plant growth in a water body in response to excess nutrients entering the system as a result of human activities. Discharges from municipal and industrial wastewater treatment plants, agricultural runoff, and stormwater are examples of human-derived (i.e., anthropogenic) sources of nutrients in surface waters.

The New Hampshire Surface Water Quality Regulations do not contain numeric criteria for phosphorus and instead include a narrative criterion requiring that the phosphorus contained in an effluent shall not impair a water body's designated use. Specifically, Env-Wq 1703.14(b) states that "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring". Env-Wq 1703.14(c) further states that "Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards". Cultural eutrophication is defined at Env-Wq 1702.15 as "….the human-induced addition of wastes containing nutrients to surface waters which results in excessive plant growth and/or a decrease in dissolved oxygen".

In the absence of numeric criteria for phosphorus, EPA uses nationally-recommended criteria and other technical guidance to develop effluent limitations for the discharge of phosphorus. EPA has published national guidance documents which contain recommended instream criteria for total phosphorus. EPA's 1986 *Quality Criteria for Water* (the "Gold Book") (USEPA 1986 [EPA 440/5-86-001]) recommends that instream phosphorus concentrations not exceed 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly into lakes or impoundments, and 0.025 mg/l within the lake or reservoir.

EPA released recommended ecoregional nutrient criteria in December 2000, which were established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published criteria represent conditions in waters within ecoregions that are minimally impacted by human activities (reference conditions), and thus free from the effects of cultural eutrophication. Nashua is located within Ecoregion VIII, Nutrient Poor Largely Glaciated Upper Midwest and Northeast. The recommended criteria for this ecoregion is a total phosphorus concentration of 10 µg/l (0.01 mg/l) and a chlorophyll *a* concentration of 0.63 µg/l (0.00063 mg/l) (*Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII* (USEPA December 2001 [EPA 822-B-01-015]).

In conjunction with the New England States, Mitchell, Liebman, Ramseyer, and Card developed potential nutrient criteria for rivers and streams in New England (in draft 2004). Using several river examples representative of typical conditions for New England streams and rivers, they investigated several approaches for the development of river and stream nutrient criteria that would be dually protective of designated uses in both upstream reaches and downstream impoundments. Based on this investigation, an instream total phosphorus concentration of 0.020 mg/l – 0.022 mg/l was identified as being protective of designated uses for New England rivers and streams. The development of these New England-wide total phosphorus criteria was based on more recent data than that used in the development of the Ecoregional nutrient criteria, and has been subject to quality assurance measures. Additionally, the development of the New England-wide criteria included the use of reference conditions presumed to be protective of designated uses.

EPA has decided to apply the Gold Book criterion (0.100 mg/l) when developing effluent limitations for NPDES permits because it was developed from an effects-based approach rather than the reference conditions-based approach used in the derivation of the ecoregional criteria. The effects-based approach is preferred in this case because it is more directly associated with an impairment of a designated use (i.e., recreation, aquatic life, etc.). The effects-based approach provides a threshold value above which adverse effects (i.e., water quality impairments) are likely to occur. It applies empirical observations of a causal variable (i.e., phosphorus) and a response variable (i.e., algal growth) associated with impairment of designated uses. Reference-based values are statistically derived from a comparison within a population of rivers in the same ecoregional class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

While phosphorus is a causal indicator of eutrophication (its presence in excess quantities in freshwater systems results in accelerated macrophyte growth), chlorophyll *a* and dissolved oxygen are response indicators whose quantities may be correlated with the amount of phytoplankton (suspended plant biomass) present within the system (USEPA 2000, Chapra 1997, Thomann & Mueller 1987). Elevated concentrations of chlorophyll *a*, excessive algal and macrophyte growth, and low levels of dissolved oxygen are all effects of nutrient enrichment. The relationship between these factors and high instream total phosphorus concentrations is well documented in scientific literature, including guidance developed by EPA to address nutrient over-enrichment (*Nutrient Criteria Technical Guidance Manual – Rivers and Streams* (USEPA July 2000 [EPA-822-B-00-002])). The values used to correlate mean chlorophyll *a* concentrations with the trophic status of freshwater systems have been summarized from the scientific literature and are presented in Table 3.

As previously discussed, Chlorophyll *a* is identified as causing impairment of the primary contact recreation designated use in the segment of the Merrimack River into which the Nashua WWTF discharges in the *State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (Assessment Unit ID: NHRIV700061206-24; see *State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (NHDES 2010)). A TMDL for chlorophyll *a* for this segment

Table 3 Freshwater System Trophic Status Based on Mean Chlorophyll *a* Concentration[1]

Trophic Status	Wetzel (2001)	Ryding and Rast (1989)	Smith (1998)	Novotny and Olem (1994)
Eutrophic	> 10 µg/l	6.7-31 µg/l	----------	> 10 µg/l
Mesotrophic	2-15 µg/l	3-7.4 µg/l	3.5-9 µg/l	4-10 µg/l
Oligotrophic	0.3-3 µg/l	0.8-3.4 µg/l	----------	< 4 µg/l

1. Adapted from *Ambient Water Quality for Dissolved Oxygen, Water Clarity, and Chlorophyll a for Chesapeake Bay and its Tidal Tributaries* (USEPA 2003)

of the Merrimack River is scheduled to be completed by 2019 (*State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (NHDES 2010)). In the absence of a TMDL, EPA is required to use available information to establish water quality-based limits when issuing NPDES permits to facilities which discharge to impaired waters. See generally 40 CFR §122.44(d). Although the New Hampshire water quality standards do not include numeric criteria for chlorophyll *a,* NHDES applies a threshold chlorophyll *a* concentration of 15 µg/l when determining whether to list a fresh water body as impaired for the primary contact recreation designated use (*State of New Hampshire 2010 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (CALM)*, (NHDES 2010). It should be noted that the 15 µg/l threshold value is only a guidance value used for determining support/non-support of recreational uses, not for determining support/non-support of aquatic life uses.

Although the Merrimack River is not listed as impaired due to phosphorus at the segment beginning at the Massachusetts border, total phosphorus is identified as causing impairment of water quality in the next downstream segment (segment MA84A-02) in Massachusetts. This segment of the Merrimack River is impounded by the Pawtucket Dam, approximately 9 miles downstream from the discharge. The various physical, chemical, and biological processes occurring within or at an impoundment affects the flux of nutrients in the water column. Phosphorus that has sequestered by aquatic plants and/or in sediments may be released into and/or re-suspended in the water column, rendering it available for biological uptake either within the impoundment or in downstream waters (see *Water Quality Criteria for Water*, pg. 241 (USEPA 1986) and *Nutrient Criteria Technical Guidance Manual – Rivers and Streams*, Chapt. 1, pg. 3 (USEPA 2000 [EPA822-B-00-002]). Therefore, phosphorus loadings to the receiving water from upstream sources, including the Nashua WWTF, might negatively impact water quality in the downstream segments as a function of the dynamics of the impoundment.

The results of phosphorus and chlorophyll *a* analyses conducted on samples collected within the segment of the receiving water into which the Nashua WWTF discharges (both upstream and downstream from the discharge) between 2005-2011 by NHDES as part of their Ambient River Monitoring Program (ARMP), and in 2010 by the Unites States Army Corps of Engineers (USACE) as part of the *Upper Merrimack and Pemigewasset River Study* (U.S. Army Corps of

Engineers, January 2011 (prepared by CDM))[2], are summarized in Table 4. The results suggest that the ecoregional chlorophyll *a* criterion of 0.63 µg/l as well as threshold chlorophyll *a* value of 15 ug/l used by NHDES in listing surface waters as impaired for the primary contact recreation designated uses are being exceeded in the receiving water in the vicinity of the discharge. These results are also within the ranges identified in the literature as indicative of mesotrophic-eutrophic conditions (see Table 3). The data presented also indicate that the instream phosphorus concentrations downstream from the discharge exceeded the recommended target of 0.090 mg/l (the Gold Book Criterion of 0.100 mg/l multiplied by a factor of 0.9 to reserve 10% of the assimilative capacity of the receiving water in accordance with the New Hampshire Water Quality Standards found at Env-Wq 1705.02) on two occasions, and that the ecoregional criterion of 0.63 µg/l (0.00063 mg/l) was exceeded on all occasions.

While these sampling events were conducted during the months of the year in which the Merrimack River typically experiences lower flows. it should be noted that from 2005-2011, the flows recorded at the nearest United States Geological Survey (USGS) gaging station located upstream from the Nashua WWTF (USGS gaging station No. 01092000, Merrimack River near Goffs Falls, below Manchester) on the sampling dates for the data presented in Table 4, were on average five times the 7Q10 flow for that gage (638.7 cfs).

Table 4 Instream Chlorophyll *a* and Total Phosphorus Concentrations Upstream and Downstream From the Nashua WWTF

Station[1]	Date	Chlorophyll *a*[2] (µg/l)	Total Phosphorus (µg/l)
Upstream of Nashua WWTF			
03-MER	10/05/2007	0.2	110
02M-MER	07/27/2010	20.85	36
Min.		**0.2**	**36**
Max.		**20.85**	**110**
Avg.		**10.53**	**73**
Median		**10.53**	**73**

Station[1]	Date	Chlorophyll *a*[2] (µg/l)	Total Phosphorus (µg/l)
Downstream From Nashua WWTF			
01-MER	06/21/2007	9.539	48
01-MER	07/19/2007	3.966	63
01-MER	08/23/2007	9.629	91
01-MER	08/23/2007	10.29	90
01-MER	10/05/2007	1.977	12

[2] *Upper Merrimack and Pemigewasset River Study* by the U.S. Army Corps of Engineers, January 2011 (prepared by CDM) ftp://ftp.usace.army.mil/pub/nae/UMRB-REPORTJAN2011/UMPRS_Year1%20Data%20Report%20Appendix_Jan2011.pdf

01-MER	06/19/2008	11.433	64
01-MER	07/17/2008	13.395	67
01-MER	08/25/2008	3.439	37
01-MER	06/24/2009	2.164	51
01-MER	07/21/2009	2.7972	35
01-MER	06/22/2010	11.6329	57
01-MER	07/20/2010	22.54	40
02K-MER	07/27/2010	16.09	46
01X-MER	07/27/2010	19.26	55
01X-MER	07/27/2010	17.45	51
01-MER	08/17/2010	15.02	91
01-MER	06/21/2011	12.47	47
01-MER	07/19/2011	15.23	55
01-MER	08/23/2011	6.24	55
Min.		**1.98**	**12**
Max.		**22.54**	**91**
Avg.		**10.77**	**55.53**
Median		**11.43**	**55**

[1]NHDES Sampling Stations – 03-MER, 1.2 miles upstream of Nashua WWTF, Rt. 111 bridge, E. Hollis St., Nashua; and 01-MER, 5.7 miles downstream of Nashua WWTF, Rt. 113 bridge, Tyngsborough MA. ACOE Sampling Stations – 02M-MER, approximately 100 feet upstream of Nashua WWTF; 01X-MER and 02K-MER, approximately 500 feet and 8,250 ft downstream of Nashua WWTF, respectively.

The results of phosphorus analyses conducted on samples of the Nashua WWTF's effluent in conjunction with the USACE's *Upper Merrimack and Pemigewasset River Study* (U.S. Army Corps of Engineers, January 2011) were 2.10 mg/l (July 2010) and 2.16 mg/l (September 2010). The median of the upstream data and the maximum of the effluent data were factored into the equation shown below to project the instream phosphorus concentration that can be expected to occur downstream from the discharge under critical (7Q10) stream flow conditions.

$$Q_d C_d + Q_s C_s = Q_r C_r$$

Where:

C_r = resultant downstream phosphorus concentration (mg/l)
Q_d = effluent flow (design flow = 16 mgd = 24.75 cfs)
C_d= maximum effluent phosphorus concentration (2.16 mg/l)
Q_s = upstream 7Q10 flow (759.4 cfs)
C_s = median instream phosphorus concentration, upstream from the discharge (0.073 mg/l)
Q_r = 7Q10 flow just downstream from the discharge (784.1 cfs)

$$C_r = (Q_s C_s + Q_d C_d) / Q_r$$

C_r = [(759.4 cfs *0.073 mg/l) + (24.75 cfs * 2.55 mg/l)] / 784.1cfs = 0.139 mg/l

The projected downstream concentration of 0.139 mg/l is greater than the recommended target of 0.090 mg/l (the Gold Book Criterion of 0.100 mg/l multiplied by a factor of 0.9 to reserve

10% of the assimilative capacity of the receiving water in accordance with the New Hampshire Water Quality Standards found at Env-Wq 1705.02). This indicates that reasonable potential exists for the discharge of phosphorus from the Nashua WWTF to cause or contribute to violations of water quality standards in the downstream receiving water.

Given that reasonable potential exists for the discharge to cause or contribute excursions above the in stream phosphorus criterion as well as the impairment in this segment of the receiving water due to chlorophyll *a*, which is indicative of nutrient enrichment, the draft permit includes proposes a monthly average phosphorus effluent limitation of 0.600 mg/l, which was calculated as shown below.

$$C_d = (Q_r C_r - Q_s C_s)/Q_d$$

Where:

C_r = resultant downstream phosphorus concentration, equal to Gold Book criterion * 0.9 (0.090 mg/l)
Q_d = effluent flow (design flow = 16 mgd = 24.75 cfs)
C_d= maximum effluent phosphorus concentration (limit) (mg/l)
Q_s = upstream 7Q10 flow (759.4 cfs)
C_s = median instream phosphorus concentration, upstream from the discharge (0.073 mg/l)
Q_r = 7Q10 flow just downstream from the discharge (784.1 cfs)

C_d = [(784.1 cfs *0.090 mg/l) - (759.4 cfs * 0.073 mg/l)]/24.75 cfs = 0.600 mg/l

This is a seasonal limitation, which shall be in effect from April 1st – October 31st.

D. Whole Effluent Toxicity (WET)

EPA's *Technical Support Document for Water Quality Based Toxics Control* (USEPA 1991 [EPA/505/290-001]) recommends using an "integrated strategy" containing both pollutant (chemical) specific approaches and whole effluent (biological) toxicity approaches to control toxic pollutants in effluent discharges from entering the nation's waterways. EPA-Region I adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. These approaches are designed to protect both aquatic life and human health. Pollutant-specific approaches such as those found in the Gold Book and state regulations address individual chemicals, whereas whole effluent toxicity (WET) approaches evaluate interactions between pollutants, thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. Furthermore, WET measures the "additive" and/or "antagonistic" effects of individual chemical pollutants, which pollutant-specific approaches do not; thus, the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through this process.

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts and New Hampshire law states that, "all waters shall be free from toxic substances or

chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life; ...." (NH RSA 485-A:8, VI and the New Hampshire Code of Administrative Rules, Part Env-Wq 1703.21). The federal NPDES regulations found at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when reasonable potential exists for a discharge to cause or contribute to an excursion above state narrative criteria for toxicity. Furthermore, the results of toxicity tests may be used to demonstrate compliance with the "no toxics in toxics amounts" requirement found in both the CWA and in the State of New Hampshire's regulations.

The current policy of EPA-Region I is to require toxicity testing in all NPDES permits issued to POTWs, with the type of whole effluent toxicity test(s) (acute and/or chronic) and the effluent limitation(s) required by the permit being based on the available dilution. NPDES permits issued to municipal (i.e., POTWs) discharges having a dilution factor between 20 and 100 typically include an acute (LC_{50}) WET limit. The acute limit (LC_{50}) is the percentage of effluent in a sample that must not cause more than a 50% mortality rate in the test organisms. Therefore, an acute (LC_{50}) limit of 100% means that a sample of 100% effluent (no dilution) shall be lethal to no more than 50% of the test organisms. The results of WET tests conducted from 2007-2012 are shown in Attachment D.

The draft permit includes an acute (LC_{50}) limit of 100 % which was based on the revised dilution factor of 28.5. This limit is the same as the WET limit in the 2000 permit, in keeping with the antibacksliding requirements of 40 CFR § 122.44(1).

The existing permit contains a provision which would allow for a reduction in the frequency of WET testing if specific conditions are met. In response to a request submitted by the City requesting such a reduction, WET test reports for tests conducted from December through March 2012 were evaluated. This evaluation found consistent compliance with the WET limits in the 2000 permit and that test acceptability criteria were consistently achieved. Therefore, the quarterly WET testing frequency that is required under the 2000 permit has been reduced to twice per year in the draft permit. Samples for use in WET tests shall be collected and the tests completed by the calendar quarters ending March 31st and September 30th, using the daphnid, *Ceriodaphnia dubia* (*C. dubia*) and the fathead minow, *Pimephales promelas* (*P. promelas*) as test organisms.

If the results of WET tests indicate that the discharge presents a risk of toxicity, the monitoring frequency and/or testing requirements may be increased. The permit may also be modified, or alternatively revoked and reissued, to incorporate additional toxicity testing requirements or chemical-specific limits. These actions will occur if the Regional Administrator determines that the New Hampshire water quality standards are not adequately enforced and users of the receiving water are not adequately protected during the remaining life of the permit. Results of development"; therefore, the permitting authority is allowed to use said information to modify an issued permit under the authority granted in 40 CFR §122.62(a)(2).

Additional Analyses

The draft permit maintains the requirement in the 2000 permit for the reporting of several selected parameters, including ammonia nitrogen (as N); hardness; alkalinity; and total recoverable aluminum, cadmium, copper, lead, nickel, and zinc, the results of which are determined through analyses conducted on samples of the 100 % effluent sample in conjunction with WET tests. The requirement in the existing permit for the analysis of chromium in addition to the aforementioned parameters has not been included in the draft permit, as it is no longer required in accordance with the current WET test protocol (see Attachment B, *Freshwater Acute Toxicity Test Procedure and Protocol,* USEPA February 2011). The results of additional analyses conducted in conjunction with WET tests from 2007-2012 are shown in Attachment D.

As discussed in Part VII.C.2. of this fact sheet, limitations for total recoverable aluminum, zinc, nickel, cadmium, and chromium are not included in the draft permit because the potential for the discharge of these metals from the Nashua WWTF to cause or contribute to an excursion above water quality criteria does not exist. However, the draft permit does include limitations and monitoring requirements for total recoverable copper and lead because potential does exist for the discharge of these metals to result in excursions above water quality criteria (also see Part VII.C.2. of this fact sheet). The results of the copper and lead analyses conducted in conjunction with WET tests may be used to satisfy one of the monthly sampling requirements specified in Part I.A. of the draft permit for the particular month in which sampling is conducted.

VIII. COMBINED SEWER OVERFLOWS

A. Nashua's Combined Sewer System

The City of Nashua owns and operates a wastewater collection system comprised of 75 percent sanitary sewers, which carry domestic, industrial, and commercial wastewater; and 25 percent combined sewers, which carry domestic, industrial, and commercial wastewater plus stormwater runoff. Under normal flow conditions, wastewater is conveyed to the POTW through three interceptor sewers: the North Merrimack Interceptor, the South Merrimack Interceptor and the Salmon Brook Interceptor. During certain wet weather events, discharges of untreated sanitary wastewater and stormwater occur from the City's eight combined sewer overflow outfalls (CSOs) listed in Attachment A into the Nashua and Merrimack Rivers, as shown in Figure 4. Discharges from CSOs have been identified as significant sources of pollution to the Nashua and Merrimack Rivers (*State of New Hampshire Final 2010 Section 303(d) Lists* (NHDES 2010)).

The current permit authorizes these eight CSOs subject to technology-based requirements (the nine minimum controls described in Part VIII.B. of this fact sheet) and to requirements that the discharges may not cause violations of water quality standards.

Since the issuance of the 2000 permit, the City entered into a Consent Decree with EPA and NHDES concerning sanitary sewer overflows (SSOs) and CSOs (Civil Action No. 05-376-PB, December 26, 2005; as amended on March 31, 2009; "Consent Decree"). The overall goal of the Consent Decree is to ultimately bring all wet weather discharges from CSOs into compliance with the requirements of the CWA and applicable state water quality standards. The main elements of the Consent Decree include: milestones for achieving levels of CSO control which

are expected to result in no discharges of untreated CSOs during a typical year[3], the development and implementation of a High Flow Management Plan (HFMP) for optimizing the treatment of wet-weather flows as well as interim limits and conditions for flows that bypass secondary treatment; the development and implementation of a program for the preventative maintenance of the collection system; and investigation into the sources and quantities of excessive infiltration and inflow (I/I) to the collection system. Ongoing wastewater-related construction projects in the City include the construction and implementation of the following controls that will reduce discharges of untreated wastewater through the CSOs in accordance with the Consent Decree: Partial separation of the combined system, increasing the capacity for the off line storage of combined flows, screening and disinfection, system optimization measures, and the Wet Weather Flow Treatment Facility.

CSO discharges have been significantly reduced since 2009, which appears to correlate with the implementation of the CSO controls described above, particularly the operation of the Wet Weather Flow Treatment Facility (see Attachment F).

B. Regulatory Framework

As noted above, Section 301(b)(1)(C) of the CWA of 1977 mandated compliance with water quality standards by July 1, 1977. Technology-based permit limits must be established for CSOs for best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) based on best professional judgment (BPJ) in accordance with Section 301(b) and Section 402(a) of the Water Quality Act Amendments of 1987 (WQA). Additionally, permit conditions must also achieve compliance with applicable state water quality standards.

The framework for compliance with Clean Water Act requirements for CSOs is set forth in EPA's National CSO Control Policy ("CSO Policy"), which was published in the Federal Register on April 19, 1994 (59 Fed. Reg. 18688) and sets forth the following objectives:

(1) To ensure that if the CSO discharges occur, they are only as a result of wet weather,

(2) To bring all wet weather CSO discharge points into compliance with the technology-based requirements of the Clean Water Act (CWA) and applicable federal and state water quality standards, and

(3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

Among the elements established to achieve these objectives, the CSO Policy set forth the minimum BCT/BAT controls (i.e., technology-based limits) that represent the BPJ of the Agency

[3] The MOUSE hydrologic model was used in determining levels of CSO control that will ultimately achieve no discharges of untreated CSOs during the largest storm in a typical year. The specific levels of CSO control for each outfall are described in the Long Term Control Plan (LTCP) submitted by the City in 2003, as amended in 2004.

on a consistent, national basis. These are the Nine Minimum Controls ("NMCs") defined in the CSO Policy and set forth in Part I.B. of the draft permit: (1) proper operation and regular maintenance programs for the sewer system and the combined sewer overflows; (2) maximum use of the collection system for storage; (3) review and modification of the pretreatment programs to assure CSO impacts are minimized; (4) maximization of flow to the POTW for treatment; (5) prohibition of dry weather overflows; (6) control of solid and floatable materials in CSOs; (7) pollution prevention programs which focus on contaminant reduction activities; (8) public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and (9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

The City of Nashua submitted documentation of its plan for implementing the Nine Minimum Controls, titled "High Flow Management Plan for the Nashua Wastewater Treatment Plant", in November 1999. This document has since undergone several revisions, with the most recent revision occurring in April 2010 to include updated bypass procedures which incorporate the use of the Wet Weather Flow Treatment Facility.

The CSO Policy also recommended that each combined sewer system develop and implement a long-term CSO control plan ("LTCP") that will ultimately result in compliance with the requirements of the CWA. The City submitted a draft LTCP to EPA in September of 1997, which was revised in January of 2003. A re-evaluation of the CSO controls selected for CSOs #005 and 006 in the 2003 LTCP was submitted to EPA in 2009. The controls identified in the re-evaluation study were incorporated into the 2005 Consent Decree through a modification in 2009.

Pursuant to the Clean Water Act and the CSO Policy, the untreated CSOs, Screening and Disinfection Facility ("SDF") and the Wet Weather Flow Treatment Facility ("WWFTF") are CSOs, meaning they are not subject to the secondary treatment standards that apply to the POTW treatment plant, but are required to achieve technology based requirements as defined in the CSO policy (the nine minimum controls) and limitations necessary to achieve water quality standards. Therefore, the draft permit includes applicable technology and water quality based limitations on discharges from the Wet Weather Flow Treatment Facility and from the Screening and Disinfection Facility. In addition, the draft permit includes monitoring requirements which will provide information necessary for evaluating the effectiveness of the WWFTF's and screening and disinfection facility's use as CSO control measures. Water quality-based limits apply to the combined effluent at outfall 001.

C. Permit Requirements

In accordance with the National CSO Policy, the draft permit contains the following conditions for the CSO discharges:

(i) Dry weather discharges from CSO outfalls are prohibited. Dry weather discharges must be immediately reported to EPA and NHDES.

(ii) During wet weather, the discharges must not cause any exceedance of water quality standards.

(iii) The permittee shall meet the technology-based Nine Minimum Controls described above and shall comply with the implementation levels as set forth in Part I.B. of the draft permit.

(iii) Discharges from CSO outfalls to non-tidal waters shall not exceed 1,000 colonies per 100 ml of *Escherichia coli* bacteria in accordance with the New Hampshire Surface Water Quality Regulations (See Env-Wq 1703.06(c)).

(iv) The permittee shall review its entire NMC program and revise it as necessary. Documentation of this review and any resultant revisions made to the NMC program shall be submitted to EPA and NHDES **within 6 months of the effective date of the permit.** An annual report shall be provided by March 1st of each year which describes any subsequent revisions made to the NMC program and shall also include monitoring results from CSO discharges, and the status of CSO abatement projects.

In addition to the requirements described above, the operation of the SDF and the WWFTF are subject to additional technology-based effluent limitations and monitoring requirements. These CSO treatment facilities represent enhancements of the Nine Minimum Controls, allowing for greater use of the collection system for storage (NMC #2) and return of the flow to the POTW for treatment (NMC #4), removal of floatable and solid materials (NMC #6), and reduction of pathogenic bacteria through disinfection (NMC #7).

EPA has determined additional BCT/BAT effluent limitations using its best professional judgment (BPJ) that are consistent with the design parameters for the WWFTF as provided to NHDES and EPA. In making this determination EPA considered the factors identified in 40 C.F.R § 125.3(d), including the cost and benefits of the facility (analyzed in connection with the development of the city's LTCP); the newness of the facility, and the fact that the facility was engineered to meet the design parameters. The proposed BPJ limits in the draft permit are an average monthly TSS concentration of 30 mg/l and a minimum of 80 % reduction. The draft permit also proposes monitoring requirements for flow and BOD_5 for the WWFTF.

Water quality-based limitations for *E. coli* and total residual chlorine apply to the discharge from the Screening and Disinfection Facility, and are based on state water quality standards (see Env-Wq 1703.6(c) and Env-Wq. 1703.21, Table 1703.1, respectively). The proposed *E. coli* limit in the draft permit is 1,000 colonies/100 mL. The proposed limits for total residual chlorine are an average monthly concentration of 0.055 mg/l and a maximum daily concentration of 0.095 mg/l, respectively. These limits were derived from the TRC criteria established in the New Hampshire Water Quality Standards at Env-Wq 1700.21, Table 1703.1, and the available dilution in the vicinity of the discharge. The derivations of the dilution factor and the proposed TRC limits are provided in Attachment I.

The draft permit requires the permittee to notify EPA and NHDES in writing 60 days prior to the commencement of operation of the SDF and to include the outfall discharge number in this notification. The authorization to discharge and associated conditions which apply to the SDF shall become effective on the first day of the calendar month immediately following the date on this notification. EPA recognizes that the permittee will not have established an operational history of the SDF upon its commencement of operation which would allow for the identification and implementation of any operational changes that may be necessary for optimizing the treatment process so as to meet the effluent limitations proposed in the draft permit. The New Hamphshire Water Quality Standards do not include a provision for the incorporation of schedules for achieving compliance with permit limits in NPDES permits. Such schedules may be implemented through an Administrative Consent Order ("ACO"), and the permittee may contact the EPA Region I Compliance Office to explore this option.

Effluent from the WWFTF flows to the chlorine contact chamber of the WWTF, where it is combined with secondary effluent (and primary effluent, in the case of a bypass of secondary treatment) before being discharged to the Merrimack River through outfall 001 (Figure 3). Therefore, the "combined effluent" must meet the water quality-based limitations which apply to outfall 001.

In order to ensure the collection of data which will allow for a determination to be made regarding whether the operation of the WWFTF facility is consistent with the objectives and assumptions underlying the LTCP, the draft permit also requires the reporting of flow (treated flow as well as flow drained back to the POTW for secondary treatment), BOD_5, TSS, and precipitation data. Similarly, reporting of flow, BOD_5, activation frequency and duration is proposed for the screening and disinfection facility.

This monitoring will provide information necessary for understanding the operation of the collection system during wet weather and will allow for determinations to be made with respect to the effectiveness of its operation consistent with the Nine Minimum Controls.

D. Reopener/Additional CSO Control Measures

The draft permit requires an annual certification no later than January 15th of each year that states that all discharges from combined sewer outfalls were recorded, and other appropriate records and reports maintained for the previous calendar year.

In accordance with Part II.A.4. of the draft permit, this permit may be modified or reissued upon the completion of a long-term CSO control plan. Such modification may include performance standards for the selected controls, a post construction water quality assessment program, monitoring for compliance with water quality standards, and a reopener clause to be used in the event that the selected CSO controls fail to meet water quality standards. Section 301(b)(1)(C) requires that a permit include limits that may be necessary to protect federal and state water quality standards.

IX. OPERATION AND MAINTENANCE

Regulations regarding proper operation and maintenance are found at 40 CFR § 122.41(e). These regulations require, "that the permittee shall at all times operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit." The treatment plant and the collection system are included in the definition "facilities and systems of treatment and control" and are therefore subject to proper operation and maintenance requirements.

Similarly, a permittee has a "duty to mitigate" pursuant to 40 CFR § 122.41(d), which requires the permittee to "take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment."

General requirements for proper operation and maintenance and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Parts I.B., I.C., and I.D. of the draft permit. These requirements include mapping of the wastewater collection system, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to separate sewers to the extent necessary to prevent SSOs and I/I-related effluent violations at the wastewater treatment plant, and for maintaining alternate power where necessary.

X. INDUSTRIAL USERS

The permittee is required to administer a pretreatment program based on authority granted under 40 CFR Part 403 and Section 307 of the CWA. The permittee's pretreatment program received EPA approval on July 17, 1990 and, as a result, appropriate pretreatment program requirements were incorporated into the existing permit which were consistent with the approval and federal pretreatment regulations in effect when the permit was issued.

Periodically, the Federal Pretreatment Regulations in 40 CFR Part 403 are amended. Those amendments establish new requirements for implementation of the pretreatment program. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with the current Federal regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer use ordinance or regulation, as appropriate, to be consistent with Federal regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users. These requirements are necessary to ensure continued compliance with the NPDES permit.

In addition to the requirements described above, the draft permit requires the permittee to submit to EPA in writing, within 180 days of the effective date of the permit, a description of proposed changes to the permittee's pretreatment program deemed necessary to assure conformity with

current federal pretreatment regulations. These requirements are included in the draft permit to ensure that the pretreatment program is consistent and current with all pretreatment requirements in effect. Lastly, the permittee must continue to submit an annual pretreatment report by **March 1st**, detailing the activities of the program for the twelve month period ending 60 days prior to the due date.

XI. SLUDGE

Section 405(d) of the Clean Water Act (CWA) requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. Domestic sludge which is land applied, disposed of in a surface disposal unit, or fired in a sewage sludge incinerator is subject to Part 503 technical standards and to State Env-Wq 800 standards. Part 503 regulations have a self-implementing provision, however, the CWA requires implementation through permits. Domestic sludge which is disposed of in municipal solid waste landfills are in compliance with Part 503 regulations provided the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 CFR Part 258.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA-Region I has prepared a 72-page document entitled "*EPA Region I NPDES Permit Sludge Compliance Guidance* (USEPA 1999)" for use by the permittee in determining their appropriate sludge conditions for their
chosen method of sewage sludge use or disposal practices. This guidance document is available upon request from EPA Region 1 and may also be found at:
http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf .

The permittee is required to submit an annual report to EPA-Region I and NHDES-WD, by February 19th each year, containing the information specified in the *Sludge Compliance Guidance* document for their chosen method of sewage sludge use or disposal practices.

XII. ESSENTIAL FISH HABITAT

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish habitat (16 U.S.C. § 802(10)).

The Amendments broadly define "essential fish habitat" (EFH) as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. § 1802(10)). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH (50 CFR § 600.910(a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences or actions.

Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b)(a)(A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

Atlantic salmon (*Salmo salar*) is the only species for which EFH has been designated in the Merrimack River. According to the New Hampshire Fish and Game Department (NHF&G), no salmon fry are stocked in the Nashua River. In addition, NHF&G has reported that Atlantic salmon are not stocked in the Merrimack River in the area influenced by the discharge from the WWTF. This species is stocked further upstream in the Merrimack River watershed. The stretch of the river in the vicinity of the WWTF is used by salmon smolts in spring months for downstream passage to the sea. Adult Atlantic salmon returning to the river from the ocean do not travel upstream as far as the WWTF discharge area. They are collected at a dam in Lawrence, Massachusetts, primarily for use as broodstock.

EPA has determined that the draft permit has been conditioned in such a way so as to minimize any adverse impacts to EFH for the following reasons:

- This permit action is a reissuance of an existing NPDES permit;
- The WWTF has a dilution factor of 28.5;
- The WWTF withdraws no water from the Merrimack River; therefore, no life stages of EFH species are vulnerable to impingement or entrainment from this WWTF;
- The draft permit prohibits the WWTF discharge from causing a violation of State water quality standards;
- The draft permit contains water quality-based limits for total residual chlorine;
- The draft permit prohibits the discharge of pollutants or combinations of pollutants in toxic amounts;
- The permit requires toxicity testing two times per year to ensure that the discharge does not present toxicity problems;

EPA believes that the conditions and limitations contained within the proposed permit adequately protect all aquatic life, including those with designated EFH in the receiving water, and that further mitigation is not warranted. If adverse impacts to EFH are detected as a result of this permit action, or if new information is received that changes the basis for these conclusions, EPA will contact NMFS Habitat Division.

XIII. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act (ESA) of 1973, as amended (the "Act"), grants authority to and imposes requirements upon federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and the habitats of such species that have been designated as critical ("critical habitat").

Section 7(a)(2) of the Act requires every federal agency, in consultation with and with the assistance of the Secretary of the Interior, to ensure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence

of any listed species or result in the destruction or adverse modification of critical habitat. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species.

EPA has reviewed the federal endangered or threatened species of fish and wildlife to determine if any such listed species might potentially be impacted by the re-issuance of this NPDES permit. Shortnose sturgeon (*Acipenser brevirostrum*) and Atlantic sturgeon (*Acipenser oxyrinchus*) are the only two federally-protected fish species that have been documented in the Merrimack River. However, the upstream movement of these two species is restricted by the Essex Dam, in Lawrence, Massachusetts. This dam is approximately 13 river miles downstream of the influence of the Nashua WWTF discharge. Based on the normal distribution of these species, it is highly unlikely that they would be present in the vicinity of this discharge. Therefore, no Section 7 consultation with NMFS is required.

XIV. ANTIDEGRADATION

The New Hampshire water quality standards include an antidegradation provision which states that the existing designated uses and the level of water quality necessary to protect the existing uses shall be maintained and protected (Env-Wq 1708).

The draft permit contains limitations and conditions which are at least as stringent as those contained in the existing permit. The State of New Hampshire has indicated that there will be no lowering of water quality and no loss of existing designated uses in the receiving water as a result of this permit action, and that additional antidegradation review is not warranted at this time.

XV. MONITORING AND REPORTING REQUIREMENTS

The effluent monitoring requirements in the draft permit have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§§122.41 (j), 122.44 (l), and 122.48.

The draft permit includes new provisions related to Discharge Monitoring Report (DMR) submittals to EPA and the State. Specifically, the draft permit requires that, no later than one year following the effective date of the permit, the permittee submit all monitoring data and other reports required by the permit to EPA using NetDMR, unless the permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports (“opt-out request”).

NetDMR is a national web-based tool for regulated CWA permittees to submit DMRs electronically via a secure internet application to EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR §§ 122.41 and 403.12. NetDMR is accessed from: http://www.epa.gov/netdmr. EPA currently conducts free training on the use of NetDMR, and anticipates that the availability of this training will continue to assist permittees with the transition to use of NetDMR. To

participate in upcoming trainings, visit http://www.epa.gov/netdmr for contact information for New Hampshire.

The draft permit requires the permittee to report monitoring results obtained during each calendar month using NetDMR, no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA or to NHDES.

The draft permit also includes procedures for requesting an "opt-out". Permittees who believe they cannot use NetDMR due to technical or administrative infeasibilities, or other logical reasons, must demonstrate the reasonable basis that precludes the use of NetDMR. These permittees must submit the justification, in writing, to EPA at least sixty (60) days prior to the date the facility would otherwise be required to begin using NetDMR. Opt-outs become effective upon the date of written approval by EPA and are valid for twelve (12) months from the date of EPA approval. The opt-outs expire at the end of this twelve (12) month period. Upon expiration, the permittee must submit DMRs and reports to EPA using NetDMR, unless the permittee submits a renewed opt-out request sixty (60) days prior to expiration of its opt-out, and such a request is approved by EPA.

Until electronic reporting using NetDMR begins, or for those permittees who receive written approval from EPA to continue to submit hard copies of DMRs, the draft permit requires that submittal of DMRs and other reports required by the permit continue in hard copy format. Hard copies of DMRs shall be postmarked no later than the 15th day of the month following the completed reporting period.

XVI. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards or waives its right to certify as set forth in 40 CFR §124.53. State Water Quality Standards contain three major elements: Beneficial uses; Water Quality Criteria; and an Antidegradation Policy, all of which are part of the State's Water-Quality Certification under Section 401 of the Act. The only exception to this is that sludge conditions/requirements are not part of the Section 401 State Certification.

The staff of the NHDES-WD has reviewed the draft permit and advised EPA-Region I that the limitations are adequate to protect water quality. EPA-Region I has requested permit certification by the State and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 CFR §§124.53 and §124.55.

XVII. COMMENT PERIOD, REQUESTS FOR PUBLIC HEARINGS AND PROCEDURES FOR FINAL DECISIONS

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to:

Meridith Timony
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100 (Mail Code OEP06-01)
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1533
Fax: (617) 918-0533

Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the state agency. Such requests shall state the nature of the issue proposed to be raised at the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at the EPA office listed above.

Following the close of the comment period, and after a public hearing (if applicable), the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

Information concerning the draft permit may be obtained between the hours of 9:00 am and 5:00 pm (8:00 a.m. and 4:00 p.m. for the state), excluding holidays.

July 11, 2013
Date:

_____
Ken Moraff, Acting Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

Figures and Attachments

Figure 1 Nashua WWTF and Outfall 001

Aerial Image obtained from Google Maps (http://maps.google.com)

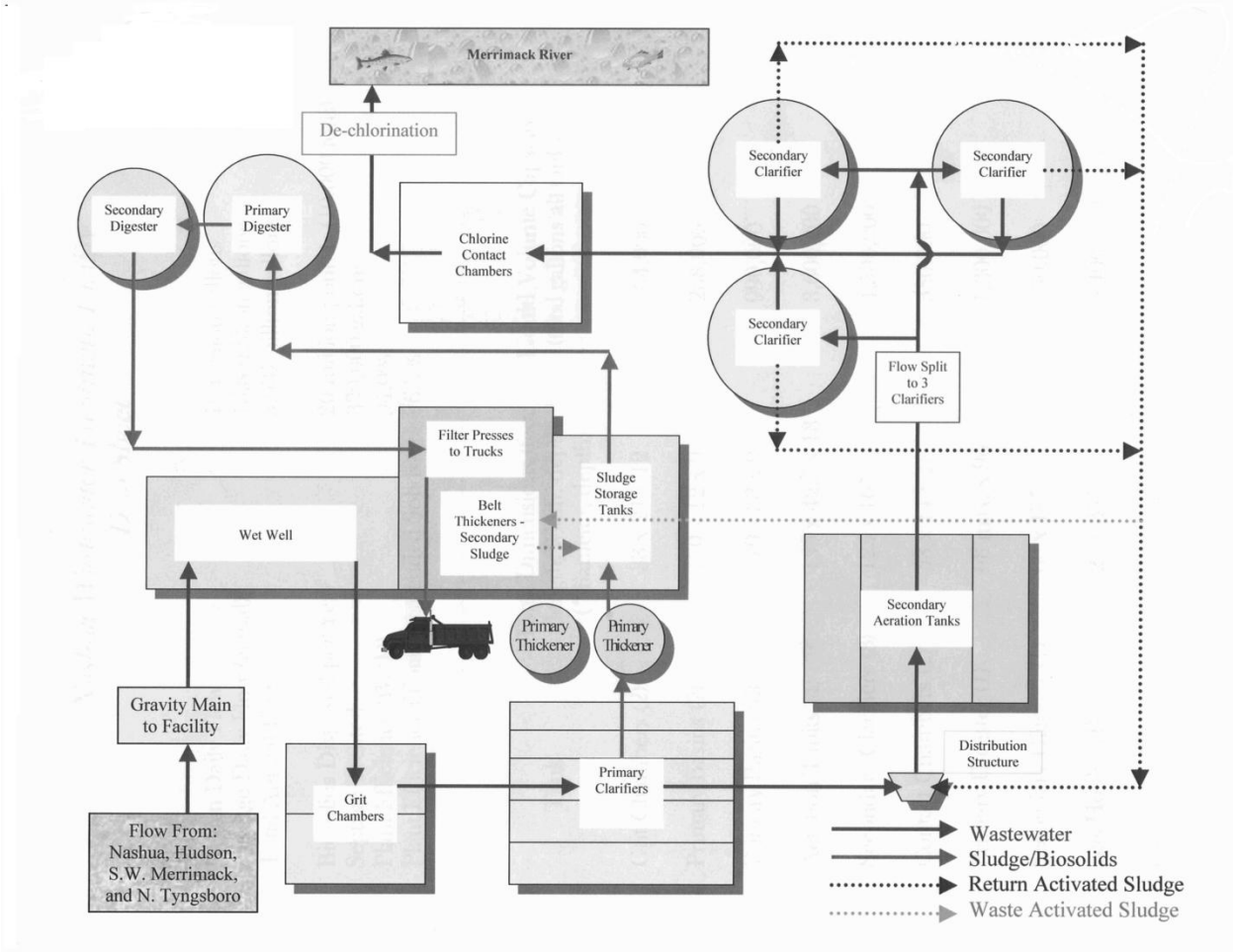

Figure 2 Nashua WWTF Process Flow Diagram

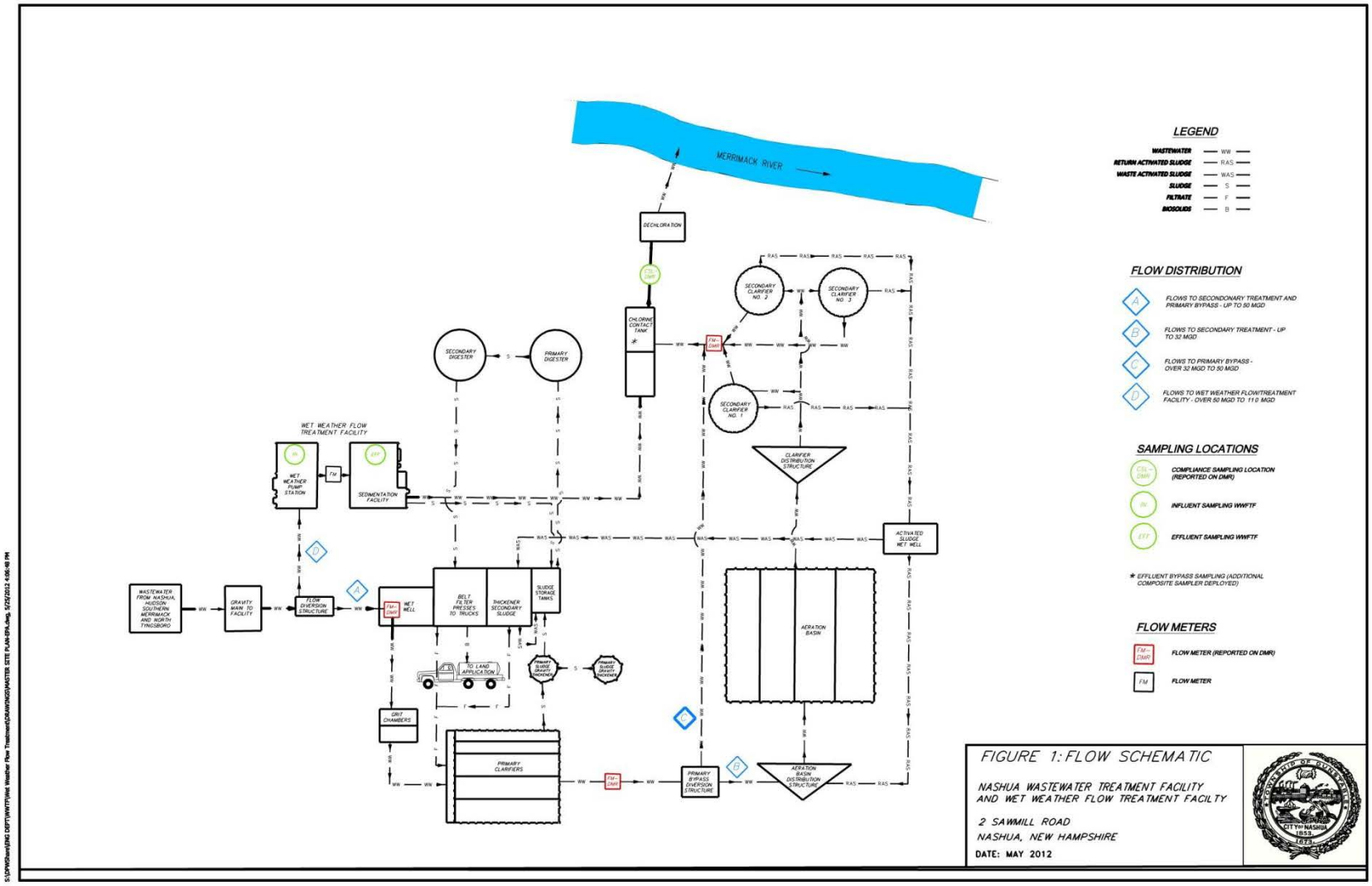

Figure 3 Wet Weather Flow Schematic

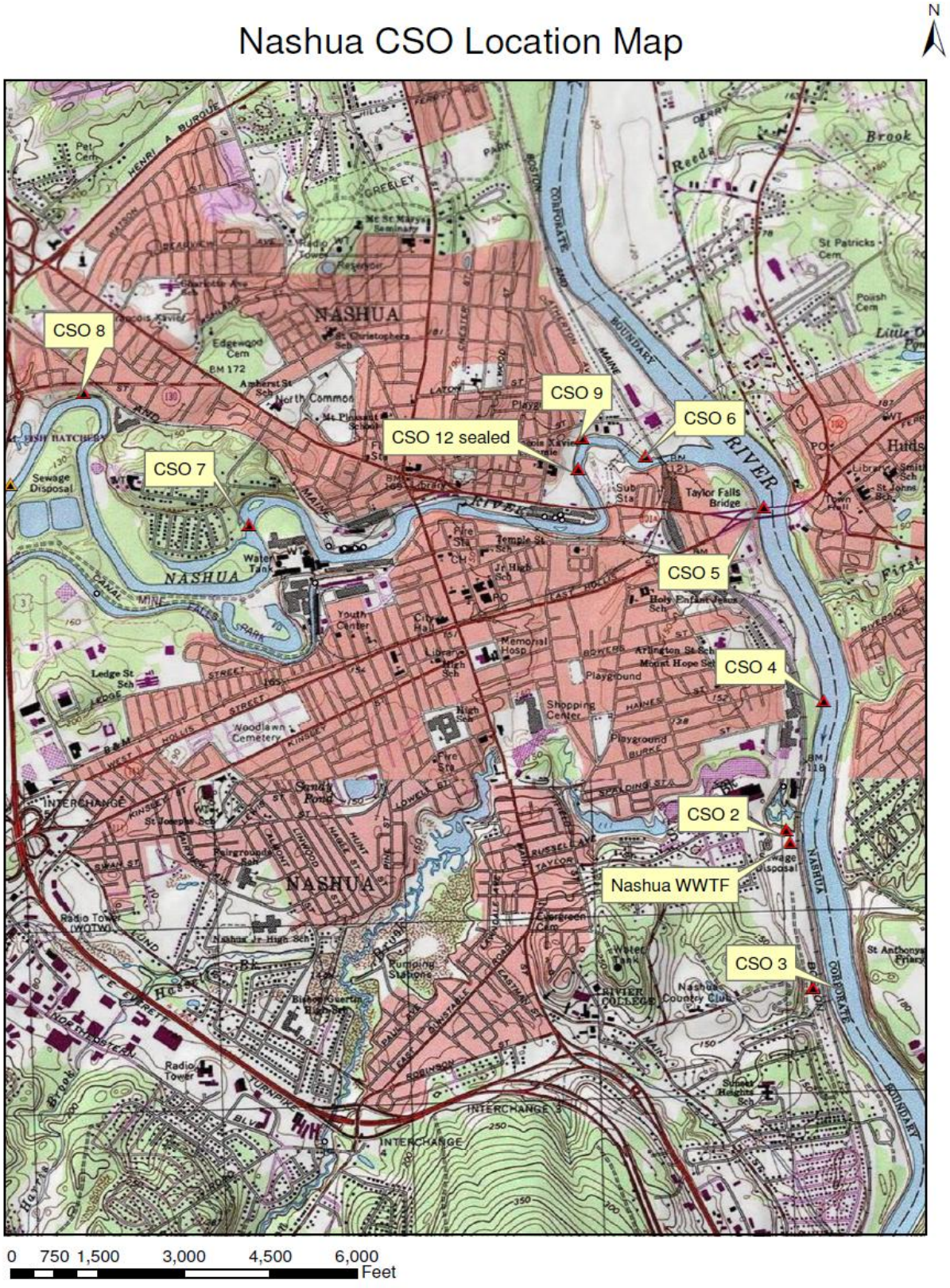

Figure 4 Nashua CSO Discharge Outfall Locations

RESPONSE TO COMMENTS
REISSUANCE OF NPDES PERMIT NO. NH0100170
CITY OF NASHUA
WASTEWATER TREATMENT FACILITY
NASHUA, NEW HAMPSHIRE

From July 23, 2013 through November 18, 2013, the U.S. Environmental Protection Agency (EPA-Region 1) and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) solicited public comments on the draft National Pollutant Discharge Elimination System ("NPDES") permit developed pursuant to an application submitted by the City of Nashua, New Hampshire, for the reissuance of its permit to discharge to the designated receiving waters.

EPA and NHDES-WD received comments from the Nashua River Watershed Association ("NRWA"), dated November 18, 2013; the City of Nashua, NH (the "permittee" or the "City"), dated November 18, 2013; and the City of Manchester, NH, dated November 14, 2013. Following a review of the comments received, EPA has made a final decision to issue the permit authorizing this discharge. In accordance with the provisions of 40 C.F.R. § 124.17, the comments received and EPA's responses to those comments, including a description of any changes made to the permit as a result of those comments as well as any clarifications EPA considers necessary, are described below.

A copy of the Final Permit may be obtained by calling or writing Meridith Timony, United States Environmental Protection Agency, 5 Post Office Square-Suite 100, Mail Code OEP06-1, Boston, Massachusetts 02109-3912; Telephone: (617) 918-1533. Copies of the Final Permit and the Response to Comments may also be obtained from the EPA Region I website at http://www.epa.gov/region1/npdes/index.html.

A. Summary of Changes to the Final Permit:

1. Screening and Disinfection Facility

Since the release of the Draft Permit for public comment, the City provided notification to EPA and NHDES of the completion of construction of the Screening and Disinfection Facility ("SDF") and associated outfall, which will provide screening and disinfection to combined flows that had previously been discharged through CSO Outfalls No. #005 and 006 to the Nashua and Merrimack Rivers, respectively. Flows from this facility will be discharged to the Merrimack River through CSO Outfall No. 014. As discussed in the Fact Sheet, the operation of the SDF is among the ongoing CSO controls implemented by the City that will reduce discharges of untreated wastewater through CSOs in accordance with the Consent Decree that was lodged on December 26, 2005 (as amended on March 31, 2009 (Civil Action No. 05-376-PB).

The authorization to discharge from Outfall No. 014 and associated conditions which apply to the SDF go into effect upon the effective date of the Final Permit. The following changes have been made to the Final Permit with respect to the SDF and CSO Outfall No. 014:

- Front Page and Attachment A– CSO Outfall No. 014 has been added to the list of outfalls that discharge to the Merrimack River.

- Part I.B.1. – CSO Outfall No. 014 is identified as an authorized CSO discharge outfall.

- Part I.B.5.b. – CSO Outfall No. 014 is identified as an authorized CSO discharge outfall.

- Part I.B.5.b. – Footnote # 1 of the Draft Permit, which required the City to provide notification to EPA and NHDES prior to the commencement of operation of the SDF, has been removed from the Final Permit.

2. Part I.A.1.a. – Inclusion of total phosphorus limit of 0.8 mg/l, which shall be in effect from April 1st – October 31st. See Response C.2.

3. Part I.A.1.a. – Footnote # 12 has been removed from the Final Permit, as provisions for modifying, revoking and/or reissuing the permit are included in Part II , Standard Conditions, as well as in 40 C.F.R. §§ 122.62 and 122.63. See Response B.11.

4. EPA has modified the language which defines dry weather in Part I.A.4. and I.B.2.d. to read as follows:

   "*The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt (defined as a day in which the temperature is greater than 32^{o} F), and 24 hours after a storm event to allow the storm-related flow to pass through the collection system and treatment facilities (as recorded by a hydrograph). The percent removal shall be calculated as a monthly average using the influent and effluent BOD_5 and TSS values collected during dry weather days."* The change was made to remove any ambiguity regarding the time it would take for the flow to pass through the collection system. See Response No. B.14.

5. Part I.B.1.c. - The due date for submitting the certification and supporting documentation of the review and revisions to the NMC implementation program has been changed to "*Within twelve months of the effective date of the permit"*. See Response B.17

6. Part I.B.2.g. - The requirements to provide both oral (i.e., within 24-hours") and written (within 5 days) to NHDES that were in the Draft Permit have been removed from the Final Permit. See Response B.20.

7. Part I.B.3.c. has been modified to read as "*Precipitation data for each day of the previous calendar year, including total rainfall, peak intensity, and average intensity*". See Response B.21.

8. Part I.B.5.a. - Footnote # 3 to Part I.B.5.a. of the Draft Permit has been removed from the Final Permit. Additionally, the monthly average effluent limitation of 30 mg/l for total suspended solids (TSS) contained in Part I.B.5.a. of the Draft Permit has been changed to a monitor only requirement in the Final Permit. See Responses B.10. and B.22.

9. Part I.B.5.a. - Footnote #8 and Part I.B.5.b. – Footnote #11 allows for the submittal of precipitation data that is collected in accordance with the City's Long Term Control Plan (LTCP) provided that the intensity and duration of each rain event whenever there is flow into the Wet Weather Flow Treatment Facility (WWFWTF) and/or Screening and Disinfection Facility (SDF), respectively, is submitted. See Response B.24.

10. A special condition has been added to the Final Permit that requires the operation of the wastewater treatment facility and the wet weather flow treatment facility during periods of wet weather to be consistent with the City of Nashua's High Flow Management Plan (HFMP), dated 2010, or the most recently–approved version of the HFMP (see Part I.C. of the Final Permit). See Response B.15.

11. Part I.D.4. – A statement has been added to clarify that any mapping of the collection system that has already been performed may be used to fulfill the requirements of Part I.D.4.

12. The Parts of the Final Permit have been re-numbered.

B. The following comments were received from Lisa M. Fauteux, Director, Division of Public Works, City of Nashua, New Hampshire, by letter dated November 18, 2013.

7Q10 DETERMINATION

Comment B.1.

EPA Region I used the S.L. Dingman Method to calculate the 7Q10 in the Merrimack River. EPA estimated the 7Q10 of the Merrimack River to be 784.1 cubic feet per second (cfs) using USGS gage station data from the Merrimack River below Manchester (01092000), the Souhegan River at Merrimack (01094000), and the Nashua River at East Pepperell (01096500), the Concord River Below R Meadow Branch (01099500), and the Merrimack River at Lowell, MA (0100000). The S.L. Dingman Method uses ungaged drainage areas to estimate a 7Q10. In this case, the ungaged drainage area between Manchester and Nashua and between Lowell and Manchester was used. EPA Region I also adjusted the upstream 7Q10 by subtracting the NWTF design flow; however, a more appropriate methodology is to subtract the NWTF's long-term average flow.

After consultation with the United States Geological Survey (USGS) in Massachusetts, it was determined that the log Pearson Fit Method for calculating the 7Q10 was more appropriate than using the S.L. Dingman Method. Hazen and Sawyer obtained station statistics for USGS gages 01092000 and 01100000. Using this data, a 7Q10 of 791 cfs was derived at Nashua using the log Pearson Fit Method. The 7Q10 of 791 cfs should be used for all analyses related to the NWTF permit, including the Reasonable Potential Analysis (RPA).

Response B.1.

It is unclear why the commenter finds the methodology applied by EPA in calculating the 7Q10 flow in the receiving water at the point of discharge, which incorporates Log-Pearson Type III statistics, to be inappropriate.

As described in the Fact Sheet, in areas where gaging data *was* available, the 7Q10 flows at the USGS gaging station sites were calculated using Log-Pearson Type III statistics, not the S.L. Dingman Method. In areas where gaging station data *was not* available (and no data exist), the S.L. Dingman Method was used to calculate the 7Q10 in the Merrimack River, as there was no data to which statistics like the log Pearson Fit Method could be applied (see Attachment B to the Fact Sheet that accompanied the Draft Permit).

The commenter also notes that "EPA Region I also adjusted the upstream 7Q10 by subtracting the NWTF design flow; however, a more appropriate methodology is to subtract the NWTF's long-term average flow." EPA's approach to performing reasonable potential analyses as well as in establishing water quality-based effluent limitations in NPDES permits issued to POTWs in New Hampshire is to apply a mass balance equation that assumes critical (7Q10) flow conditions in the receiving water, both upstream and downstream from the discharge, and that assumes the POTW is operating at design flow, rather than the long-term average flow, in order to ensure adequate protection of the receiving water under the most severe flow conditions. This is a protective, preventative approach, which is appropriate for waters suffering water quality impairments. *See also* 40 C.F.R. § 122.45(b) (…In the case of POTWs, permit effluent limitations, standards, or prohibitions shall be calculated based on design flow). Additionally, application of the facility's design flow is reasonable given that the effluent flow discharged from the facility from 2007-2012 had exceeded the design flow on several occasions, and that the median effluent flow discharged during this period approached the design flow[1]. In addition, this method of calculating 7Q10 flows is consistent with derivation of 7Q10 flows for other NPDES permits issued to POTWs in New Hampshire.

PART I.A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Comment B.2.

LANGUAGE CHANGE FOR MONITORING FREQUENCY
The previous permit required the measurement frequency for biochemical oxygen demand (BOD_5) and total suspended solids (TSS) to be weekdays whereas the Draft Permit requires the BOD_5 and TSS measurement frequency to be 5 days/week. We request that the measurement frequency for BOD_5 and TSS be changed to "*weekdays*" or to "*5 samples per calendar week*".

Response B.2.

[1] As shown in Attachment C to the Fact Sheet, the monthly average effluent flow discharged from the facility from March 2007 through March 2012 ranged from 8.1 mgd to 21.1 mgd, and the median flow was 11.4 mgd.

The monitoring frequency for BOD_5 and TSS in the Draft Permit is "5/Week", and is identical to the monitoring frequency in the permit that was issued to the City in 2000. In any case, the monitoring frequency of 5 days per week is broad enough to encompass the City's preferred sampling schedule (e.g., 5 samples per calendar week or weekdays) and shall remain in the Final Permit.

Comment B.3.

REDUCTION IN MONITORING REQUIREMENTS FOR TSS AND BOD

We request the permit to be modified to reduce the monitoring for BOD_5 and TSS. Effluent data from March 31, 2007 through March 31, 2012 was evaluated to determine the potential for reduced monitoring for these pollutants. The April 1996 EPA *Interim Guidance for Performance-Based Reductions of NPDES Monitoring Frequencies* method was used to determine the appropriate reductions. The long-term average BOD_5 was 46 percent of the permit limit. There was only one violation in 2010; however, a single violation that is more than two years old does not prohibit the reduction in monitoring frequency. According to EPA guidance, the BOD_5 monitoring frequency should be reduced from five samples per week to three samples per week. The long-term average TSS was 31 percent of the permit limit. There were no violations of the TSS limit during the period of record. As a result, the TSS monitoring frequency should be reduced from five samples per seek to two samples per week.

Response B.3.

EPA establishes, and grants reductions of, monitoring frequencies in NPDES permits on a case-by-case basis (*NPDES Permit Writers' Manual, Chapter. 8.1.3*, USEPA September 2010 [EPA-833-K-10-001]). *See* CWA §§ Sections 402(a)(2) and 301(b)(1)(C); 40 C.F.R. §§ 122.4(a) and (d); 122.43; 122.44(d); 122.44(i); 122.48(b). The *Interim Guidance for Performance-Based Reductions of NPDES Monitoring Frequencies*, referenced in the above comment, contains procedures for determining the appropriateness of reducing monitoring frequencies based on the performance of the facility in question. The Guidance suggests procedures to follow for determining reductions based on plant performance. It does not consider site-specific issues that may require more monitoring, even if the overall performance of the plant is satisfactory. As in many communities served by combined wastewater collection systems, the City's wastewater treatment facilities are affected by the intensity, duration and frequency of wet weather events. Since the issuance of the 2000 permit, the City has made significant investments in their wastewater collection system and treatment facilities to address the impacts of wet weather events. However, EPA lacks data at this time with respect to periods when the Wet Weather Flow Treatment Facility (WWFTF) is operated, which is a reason in EPA's judgment for keeping the monitoring requirements as written in the Draft Permit. In consideration of these site-specific factors, EPA has determined that the BOD_5 and TSS monitoring requirements in the Draft Permit are necessary to generate data to fully and adequately characterize the effluent quality and assess treatment efficiencies under varying flow conditions, including when the WWFTF is operated. Therefore, EPA finds that reducing the monitoring frequency for BOD_5 and TSS is not appropriate at this time, and the Final Permit remains unchanged from the Draft. The City is free to re-submit its request for a reduction in the monitoring requirements for TSS

and BOD_5 in the future in the form of a request for a permit modification once additional data have been collected, and EPA will consider the merits of that renewed request based on the larger data set that will then exist in the record.

Comment B.4.

Numeric Nutrient Criteria and Total Phosphorus Limit

EPA Region 1 has circumvented New Hampshire's narrative nutrient criteria by basing an effluent phosphorus limit on ecoregion reference conditions. In the Nashua NPDES permit, a phosphorus limit was imposed because the recreational chlorophyll *a* standard of 15 µg/l has been exceeded in the Merrimack River. The phosphorus limit was established using a mass-balance wasteload allocation procedure using the 7Q10 as the basis. The use of the wasteload allocation procedure is inappropriate and should not be used to establish nutrient limits. The effects of nutrients are long-term and affected by many external factors. Numeric nutrient criteria should be established with a site-specific study to establish the correlation between nutrients and a biological response. It does not appear that biological data has been collected in conjunction with chlorophyll *a* data to evaluate a biological response in the Merrimack River.

Irrespective of a site-specific numeric nutrient study, there does not appear to be any justification for the proposed phosphorus limit in the Nashua permit. We reviewed the *Upper Merrimack and Pemigewasset River Study Field Program 2009-2012 Monitoring Data Report*, U.S. Army Corps of Engineers dated December 2012. A review of this report indicates that the upstream and downstream data for chlorophyll *a* and total phosphorus appear to indicate that the NWTF discharge has no discernable impact on the receiving stream. For each sampling date, stream flow, along with upstream, downstream and NWTF effluent phosphorus concentrations were measured; however, a mass-balance relationship between effluent phosphorus concentration and instream phosphorus could not be inferred from the data. These findings suggest that "reasonable potential" does not exist for the Nashua discharge to cause or contribute to exceedances of the chlorophyll *a* recreation-based criterion. Furthermore, the data from the study also indicates that the Nashua discharge does not have reasonable potential to cause or contribute to violations of the narrative criteria for nutrients.

The total phosphorus limit should be removed from the permit. A site-specific study and modeling effort will determine the nutrient input versus biological response relationship in the Merrimack River watershed. The study should take into account both the point and non-point source contribution.

Response B.4.

EPA has addressed the specific comments in detail below, but as a preliminary matter, the EPA observes that most if not all of the legal/regulatory objections to the permit underlying the City's comments on the phosphorus limit have been squarely addressed in past decisions by the United States Environmental Appeals Board and by the United States Court of Appeals for the First Circuit. *See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2282 (2013) (upholding the Region's overall methodology for the imposing a phosphorus limit, including use of the Gold Book, among other information, to

establish a site-specific total phosphorus limit applicable to that particular discharge); *In re Upper Blackstone Water Pollution Abatement Dist.*, NPDES Appeal Nos. 08-11 to 08-18 & 09-06 (EAB May 28, 2010) (same); *see also, In re City of Attleboro*, NPDES Appeal No. 8-08 (EAB Sept. 15, 2009) (same). Most recently, the EAB comprehensively addressed the Region's approach to interpreting the State's narrative nutrient criterion to derive an effluent limitation in *In re Town of Newmarket Treatment Plant*, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013). EPA encourages the City to consult these decisions in conjunction with reviewing the Region's responses below.

EPA did not circumvent the narrative criteria for nutrients contained in the New Hampshire Water Quality Standards, but translated that existing criteria into a numeric effluent limitation based on the information (including site-specific data related to the effluent discharge and receiving waters) reasonably available during the permit development and reissuance process. As described in the Fact Sheet, EPA based the phosphorus limit in the Draft Permit on the Gold Book criterion, which was derived from an effects-based approach, rather than the ecoregional criterion, which was derived from a reference condition-based approach. See Fact Sheet at 19-20. EPA's overall approach to interpreting the State's narrative nutrient criterion to derive an effluent limitation is consistent with the requirements of 40 C.F.R. § 122.44(d) and has been addressed and upheld by the Environmental Appeals Board (EAB) (See Response to comment 8).

The New Hampshire Water Quality Standards do not contain criteria for chlorophyll *a.* As described in the Fact Sheet, chlorophyll *a* is a response indicator whose quantity may be correlated with the amount of phytoplankton (suspended plant biomass) present within the system (USEPA 2000, Chapra 1997, Thomann & Mueller 1987). Therefore, elevated instream chlorophyll *a* concentrations are indicative of nutrient enrichment. As such, NHDES applies a chlorophyll *a c*oncentration of 15 µg/l as a threshold value when making determinations as to whether the primary contact designated use is supported in a fresh water body under CWA Section 303(d) (see *2012 NHDES Consolidated Assessment and Listing Methodology (CALM)* (NHDES 2012)). Sections 301 and 402 of the Act, and implementing regulations at 40 C.F.R. § 122.44(d), are the provisions that govern this permitting action, not Section 303(d) and associated non-binding listing guidance such as the CALM. Therefore, the chlorophyll *a* threshold value that is used in making use support determinations is not directly applicable to this permitting action and was not determinative in EPA's permitting decision. This value was, however, one piece of information EPA considered in arriving at its decision to impose a water quality-based effluent limitation for nutrients.

It is worth noting that the chlorophyll *a* concentration of 15 µg/l used by NHDES is a threshold value for the protection of recreational uses, not for the protection of aquatic life uses, and that chlorophyll *a* values less than 15 µg/l are correlated with mesotrophic conditions in the literature (see Table 1 and Table 2).

Table 1 Freshwater System Trophic Status Based on Mean Chlorophyll *a* Concentration[1]

Trophic Status	Wetzel (2001)	Ryding and Rast (1989)	Smith (1998)	Novotny and Olem (1994)
Eutrophic	> 10 µg/l	6.7-31 µg/l	----------	> 10 µg/l
Mesotrophic	2-15 µg/l	3-7.4 µg/l	3.5-9 µg/l	4-10 µg/l
Oligotrophic	0.3-3 µg/l	0.8-3.4 µg/l	----------	< 4 µg/l

1. Adapted from *Ambient Water Quality for Dissolved Oxygen, Water Clarity, and Chlorophyll a for Chesapeake Bay and its Tidal Tributaries* (USEPA 2003)

Table 2 Nutrient (µg/l) and algal biomass criteria limits recommended to prevent nuisance conditions and water quality degradation in streams based either on nutrient-chlorophyll *a* relationships or preventing risks to stream impairment as indicated[1]

PERIPHYTON Maximum in mg/m^2						
TN	TP	DIN	SRP	Chlorophyll *a*	Impairment Risk	Source
				100-200	nuisance growth	Welch et al. 1988, 1989
275-650	38-90			100-200	nuisance growth	Dodds et al. 1997
1500	75			200	eutrophy	Dodds et al. 1998
300	20			150	nuisance growth	Clark Fork River Tri-State Council, MT
	20				*Cladophora* nuisance growth	Chetelat et al. 1999
	10-20				*Cladophora* nuisance growth	Stevenson unpubl. data
		430	60		eutrophy	UK Environ. Agency 1988
		100[1]	10[1]	200	nuisance growth	Biggs 2000
		25	3	100	reduced invertebrate diversity	Nordin 1985
			15	100	nuisance growth	Quinn 1991
		1000	10[2]	~100	eutrophy	Sosiak pers. comm.
PLANKTON Mean in µg/L						
TN	TP	DIN	SRP	Chlorophyll *a*	Impairment Risk	Source
300[3]	42			8	eutrophy	Van Nieuwenhuyse and Jones 1996
	70			15	chlorophyll action level	OAR 2000
250[3]	35			8	eutrophy	OECD 1992 (for lakes)

[1]30-day biomass accrual time
[2]Total Dissolved P
[3]Based on Redfield ratio of 7.2N:1P (Smith et al. 1997)

[1]From *Nutrient Criteria Technical Guidance Manual* (USEPA July 2000, Ch. 7, p.101 [EPA-822-B-00-002]))

The regulatory requirement for the establishment of a water quality based effluent-limit is based upon a determination that the pollutant of concern is or may be discharged at a level that will "cause, has the reasonable potential to cause, or contributes to an excursion above a State water quality standard, including State narrative criteria for water quality" (S*ee* 40 C.F.R. § 122.44(d)(1)(i)). The absence of numeric nutrient criteria does not preclude EPA from

establishing a water quality-based effluent limit in a NPDES permit. CWA § 301(b)(1)(C) and its implementing regulations at 40 C.F.R. § 122.44(d)(1), impose requirements on EPA to include in NPDES permits "any requirements…necessary to: (1) Achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality." In the absence of site-specific numeric criteria for the Merrimack River, or the development and adoption of statewide numeric criteria, EPA is compelled to establish limits that ensure compliance with all existing applicable criteria, which, in this case, are the narrative criteria found at Env-Wq 1703.14 (also see Response C.8.).

In New Hampshire, NPDES permit limits for discharges to rivers and streams are calculated such that applicable criteria are achieved under the "7Q10" flow conditions, or the "lowest average flow which occurs for 7 consecutive days on an annual basis with a recurrence interval of once in 10 years on average." *See* Env-Wq 1705.02(a) and (d). Also see Env-Wq 1702.44. EPA has simply written the permit in a manner that complies with applicable water quality standards as required by the CWA. Use of the 7Q10 flow is reasonable from a water quality perspective, as it ensures that water quality standards are met even in periods of critical low flow when the flow of the receiving water provides relatively little dilution to buffer impacts of pollutant loadings from the facility. Use of critical low flows is also consistent with the reasonably conservative approach the Region has adopted in nutrient permitting in general and that it has determined is necessary in this case in particular to break the ongoing cycle of eutrophication in the receiving waters. Please also see *In re City of Attleboro, MA Wastewater Treatment Plant*, NPDES Appeal No. 08-08, 14 E.A.D. __ (EAB, September 15, 2009) (discussing use of 7Q10 flow regimes in permit that vary from other TMDLs approved by the state and upholding the Region's determination to use 7Q10 as opposed to seasonal or annual average flows).

Upon finding that reasonable potential exists for the discharge from the Nashua Wastewater Treatment Facility ("WWTF") to cause or contribute to violations of water quality standards, EPA was obligated to impose a phosphorus limit on the discharge in accordance with the requirements of 40 C.F.R. § 122.44(d)(1) , and calculated that limit in accordance with section 122.44(d)(1)(vi). A detailed explanation of the legal and technical basis for the establishment of the phosphorus limit of the Draft Permit may be found on pages 19-24 of the Fact Sheet, as well as in Responses C.2., C.7., C.8. and C.15.

The intent of including the data presented in the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (United States Corps of Engineers ("USACE") December 2012) was to highlight the fact that the receiving water is exhibiting signs associated with eutrophication, and not to demonstrate a direct causal relationship between the discharge of phosphorus from the Nashua Wastewater Treatment Facility (WWTF) and the receiving water. These data were pieces of EPA's larger analysis of determining the need for a phosphorus effluent limitation under applicable regulations. The *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* does not replicate nor is it a substitute for the reasonable potential analysis performed by EPA in determining whether phosphorus is discharged at a level that will cause, or may cause or contribute to, violations of water quality standards.

The City contends that:

> "A review of this report indicates that the upstream and downstream data for chlorophyll *a* and total phosphorus appear to indicate that the NWTF discharge has no discernable impact on the receiving stream. For each sampling date, stream flow, along with upstream, downstream and NWTF effluent phosphorus concentrations were measured; however, a mass-balance relationship between effluent phosphorus concentration and instream phosphorus could not be inferred from the data."

EPA disagrees with the conclusory assertion that these data reveal "no discernable impact" of phosphorus on the receiving waters. While the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* does not in itself contain an analysis of the impact of the effluent discharged from the Nashua WWTF on the downstream receiving water, EPA applied the ambient and effluent phosphorus data presented in this report, as well as the receiving water 7Q10 flow and the design flow of the facility, to a mass balance equation, the result of which indicates that the discharge does in fact present reasonable potential to cause or contribute to excursions above the 0.1 mg/l total phosphorus target. Additionally, the receiving water data indicate chlorophyll *a* levels in excess of the threshold.

Based on the analysis presented in the Fact Sheet, which includes but is not limited to the information presented in the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report*), EPA has concluded that the phosphorus limit in the Final Permit is necessary to ensure compliance with water quality standards. Should additional information, including the results of a site-specific study and/or modeling effort, become available during the term of the Final Permit which changes EPA's conclusions with respect to the phosphorus limit, the permit may be modified in accordance with 40 C.F.R. § 122.62(a)(2).

Comment B.5.

Reasonable Potential Analysis for Metals

EPA Region 1 did not use the recommended method for the calculation of total recoverable permit limits from a dissolved criterion as outlined in EPA's *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (EPA 823-B-96-007, 1996). In this document, the EPA Office of Water advised that dissolved metal concentrations should be used for the application of aquatic life criteria for metals. With very few exceptions, the total recoverable-based criterion for each metal must be multiplied by a conversion factor to obtain a dissolved criterion that should not be exceeded in the water column. The wasteload allocation must be translated into a total recoverable metals permit limit. As such, the hardness-dependent Criteria Continuous Concentration (CCC) and Criteria Maximum Concentration (CMC) should be calculated using the following equations:

$$CCC = (\exp\{m_c[\ln(\text{stream hardness})] + b_c\}) \times (CCF)$$
$$CMC = (\exp\{_{ma[}\ln(\text{stream hardness})] + b_a\}) \times (CCF)$$

Where:

m_c, b_c, m_a, b_a = hardness-dependent coefficients
CCF = Chronic Conversion Factor

ACF = Acute Conversion Factor

The translator converts the value for dissolved metal at laboratory conditions to total recoverable metal at ambient conditions as follows:

$$f_d = C_{diss}/C_{total} = 1/[1 + \{[K_{po}] [ss^{(1+a)}] [10^{-6}]$$

Where:

ss = in-stream suspended solids concentration (mg/L)
K_{po}, a = partition coefficients (from guidance)

The instream allowable concentrations (IAC) are then calculated as follows:

Chronic IAC = CCC/f_d
Acute IAC = CMC/f_d

The calculated allowable effluent concentration is then:

$$C_W \leq (S_A) [C_m(Q_s+Q_w) - Q_sC_s]/Q_w$$

Where:

S_A = percent "Stream Allocation"
C_m = resultant in-stream concentration after mixing
C_w = concentration of pollutant in wastewater
C_s = stream background concentration
Q_w = wastewater flow
Q_s = stream low flow

Table 3 Summary of Revised Reasonable Potential Analysis for Copper and Lead

	Copper	Lead
Stream Background Concentration, µg/l	2.00	0.50
Fraction Dissolved (f_D)	0.35	0.18
Measured Effluent concentration, 95th percentile	30.20	2.58
CHRONIC		
Fish and Aquatic Life Water Quality Criteria	2.74	0.54
Instream Allowable Concentration	7.90	2.90
Maximum Allowable Effluent Concentration	172	71
Reasonable Potential (is Maximum Allowable < Effluent Concentration?)	NO	NO

ACUTE		
Fish and Aquatic Life Water Quality Criteria	3.63	14
Instream Allowable Concentration	11	76
Maximum Allowable Effluent Concentration	246	2,173
Reasonable Potential (is Maximum Allowable < Effluent Concentration?)	NO	NO

The facility effluent data is then compared with the allowable effluent concentrations to determine if reasonable potential exists for the discharge to result in a water quality exceedance. Typically, if the 95th percentile value exceeds the allowable concentration, then reasonable potential exists and a limit is applied. A revised Reasonable Potential Analysis was performed for copper and lead using the recalculated 7Q10, stream background data from upstream monitoring, a hardness of 25 mg/l, and a suspended solids concentration of 10 mg/L. Table 1 provides a summary of the revised RPA for copper and lead. Reasonable potential does not exist for either copper or lead to exceed water quality criteria as a result of the NWTF discharge. Limits for copper and lead should be removed from the permit.

Response B.5.

Contrary to the above comment, EPA's approach to developing the total recoverable copper and lead limits in the Draft Permit, which is described in detail below, is consistent with the recommended methodology found in *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]).

Although many inorganic components of domestic wastewater, including metals, are in the particulate form, differences in the chemical composition between effluent and receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007])[2]. Therefore, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Therefore, effluent limits for metals are expressed as total recoverable metals in accordance with the requirements of 40 C.F.R. § 122.45(c). The total recoverable concentration of a metal is a measure of both the dissolved and particulate fraction. In order to establish total recoverable limits that will ensure attainment of dissolved aquatic life criteria, conversion factors have been developed to reflect the

[2] *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]) was used as the basis for the use of the criteria conversion factor (CF). National Guidance requires that permits limits for metals are to be expressed in terms of total recoverable metal and not dissolved metal. As such, conversion factors are used to develop total recoverable limits from dissolved criteria. The conversion factor reflects how the discharge of a particular metal partitions between the particulate and dissolved form after mixing with the receiving water. In the absence of site-specific data describing how a particular discharge partitions in the receiving water, a default assumption equivalent to the criteria conversion factor is used in accordance with guidance.

partitioning of metals as the effluent mixes with the receiving water, allowing for the translation between a dissolved criterion and a total recoverable limit (and vice-versa). These conversion factors are the fraction of the total recoverable metal in the effluent that will be in the dissolved form in the receiving water (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]).

The New Hampshire Water Quality Standards contain water quality criteria for metals that are expressed in terms of dissolved metals. *See* Env-Wq 1703.21, Table 1703.1, Footnote i. Conversion factors for translating dissolved criteria into total recoverable limits are found in the New Hampshire Water Quality Standards at Env-Wq 1703.21, Table 1703.2 (also see *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]. In developing the Draft Permit, EPA applied these conversion factors to the metals criteria contained in the New Hampshire Water Quality Standards at Env-Wq 1703.21, Table 1, to translate between dissolved metals and total recoverable metals.

The equations used to derive the dissolved metals criteria contained within the state water quality standards as well as the conversion factors used to convert dissolved metals to total recoverable metals, are shown below in Table 2. *See* Env-Wq 1703.21, Table 1703.1.

Table 4 Water Quality Criteria for Metals

Metal	m_A*	b_A*	m_C**	b_C**	CF acute	CF chronic	Dissolved Criteria[1]		Total Recoverable Criteria	
							Acute Criteria (CMC) * (µg/L)	Chronic Criteria (CCC)** (µg/L)	Acute Criteria (CMC) (µg/L)	Chronic Criteria (CCC) (µg/L)
Cadmium	1.1280	-3.6867	0.7852	-2.7150	1.002	0.967	0.95	0.80	0.95	0.83
Chromium III	0.8190	3.7256	0.8190	0.6848	0.316	0.860	183.07	23.81	579.32	27.69
Copper	0.9422	-1.7000	0.8545	-1.7020	0.960	0.960	3.64	2.74	3.79	2.85
Lead	1.2730	-1.4600	1.2730	-4.7050	0.993	0.993	13.88	0.54	13.98	0.54
Nickel	0.8460	2.2550	0.8460	0.0584	0.998	0.997	144.92	16.10	145.21	16.14
Zinc	0.8473	0.8840	0.8473	0.8840	0.978	0.986	36.20	36.50	37.02	37.02
Aluminum	---	---	---	---	---	---	---	---	750	87

[1]Dissolved Criteria

Acute Criteria (CMC) = exp{ma*ln(hardness)+ba} * CF_{Acute}

Chronic Criteria (CCC) = exp{mc*ln(hardness)+bc} * $CF_{Chronic}$

[2]Total Recoverable Criteria

Acute Criteria (CMC) = Dissolved Acute Criteria/CF_{Acute}

Chronic Criteria (CCC) = Dissolved Chronic Critera/$CF_{Chronic}$

The reasonable potential analysis performed by EPA in developing the Draft Permit is provided in pages 15-18 of the Fact Sheet. The findings of this evaluation indicate that reasonable potential exists for the discharge of lead and copper from the Nashua WWTF to cause or contribute to excursions above the applicable acute and chronic water quality criteria for in the receiving water. As such, in accordance with 40 C.F.R. § 122.44(d)(1) and § 122.45(c), effluent limitations for lead and copper are included in the Final Permit. The derivation of these limits are shown in pages 15-18 of the Fact Sheet.

Comment B.6.

Sample Type for Total Residual Chlorine
The sample type for total residual chlorine should be changed from a 24-hour composite to a grab sample.

Response B.6.

The Draft Permit requires total residual chlorine samples to be collected as grab samples, not 24-hour composite samples as the commenter suggests. The Final Permit remains unchanged from the draft with respect to the sample type required for total residual chlorine monitoring.

Comment B.7.

Modification of pH Permit Limit
On August 24, 2012, the City of Nashua requested a modification of the pH permit limit from 6.5 to 8.0 standard units to 6.0 to 8.0 standard units. The City completed the pH adjustment demonstration project, the results of which support the reduction of the lower range of the pH limit from 6.5 to 6.0 standard units. The permit should be revised to reflect this change.

Response B.7.

As described in the Fact Sheet which accompanied the Draft Permit, the provision contained in the 2000 permit which would allow for a relaxation of the pH limit to outside the range of 6.5-8.0 standard units (SU), which is the designated pH range for Class B waters in the New Hampshire Water Quality Standards (Env-Wq 1703.18(b)), is no longer applicable due to the listing of the aquatic life designated use for the segment of the Merrimack River in the vicinity of the discharge as impaired due to pH in the *State of New Hampshire 2010 List of Threatened or Impaired Waters that Require a TMDL ("303(d) list")* (NHDES 2010)) (See Fact Sheet page 13). NHDES does not allow for modifications to the pH limit outside of the range specified in the Water Quality Standards when the water body is impaired for pH, which it is at this time. Therefore, the pH limit in the Final Permit remains unchanged from the draft.

Comment B.8.

Whole Effluent Toxicity Limit
Based on the revised calculation for 7Q10 and the procedures outlined in EPA's Guidance Manual, the 95th percentile for *Ceriodaphnia dubia* and *Pimephales promelas* were calculated to

be 92.9 percent and 63.9 percent, respectively. These values are different from the current permit values of 100 percent. Antibacksliding does not apply in the case, as the 2000 permit was written incorrectly. The LC_{50} should 11.69 percent based on a dilution factor of 28.5 with an instream allowable value of 0.3 TUa. The permit should be modified to reflect the correct LC_{50} values.

The NWTF has passed 22 consecutive WET tests. Therefore, based on reasonable potential, WET monitoring should be changed from semi-annual monitoring to annual monitoring.

Response B.8.

Please see ResponseB.1. regarding the calculation of the 7Q10 flow. EPA rejects that conclusion that the 7Q10 was incorrectly derived.

It is unclear why the commenter believes that the 2000 permit was written incorrectly. Further, the commenter does not explain where the specific values it references above came from, or how they were derived.[3]

Acute WET limits are established at an LC50 of 100, as opposed to being calculated from the dilution factor, in order to minimize the size of the mixing zone that will be subjected to acutely toxic levels of effluent. This is consistent with EPA and State mixing zone policies which require minimally sized mixing zones and no acute toxicity within the mixing zone. While an LC_{50} of 100 does not equate to no acute toxicity (it equates to 50% of the test organisms being killed), minimizing the size of the mixing zone minimizes the exposure period to acutely toxic levels of effluent and therefore minimizes or eliminates lethal impacts.

The WET testing requirements in the Draft Permit represent a reduction from those in the 2000 permit. This reduction was granted at the request of the City (See Fact Sheet at 25), in accordance with a provision contained in the 2000 permit that would allow for a reduction in the frequency of WET testing if specific conditions are met. This decision is partly in recognition of the facility's past performance, referenced in the comment above. Even given the facility's past performance, EPA does not believe that a once per year monitoring requirement is sufficient, given the sensitivity of aquatic life in the receiving waters to effluent toxicity, and the need to address any exceedances proactively and expeditiously, without the potential for a long lapse in time before EPA becomes aware of a problem. Therefore, the WET testing frequency in the Final Permit remains unchanged from the Draft Permit.

Comment B.9.

Whole Effluent Toxicity Monitoring

EPA Region I should not require monitoring for ammonia, hardness, aluminum, cadmium, copper, lead, nickel or zinc as part of EPA-approved WET testing. Certified WET Laboratories

[3] The Region is unsure where the 92.9 and 63.9% values came from. Assuming they are referring to the TSD, the Region calculated the 95th percentile daily max estimate for WET test results from 2007-2012, which were the results evaluated during the development of the Draft Permit. The 95th percentile daily max estimates are 105.5 (for *C. dubia*) and 126 (for *P. promelas*).

are required to follow standard quality assurance and control procedures. Furthermore, the NWTF has not had any recent WET violations that would require additional monitoring data as part of a Toxicity Identification/Reduction Evaluation (TI/RE). As such, the additional monitoring requirements included on the Effluent Limitations page and Footnote #14 should be removed from the permit.

Response B.9.

The requirement in the Draft Permit for the concurrent analyses of ammonia nitrogen (as N); hardness; alkalinity; and total recoverable aluminum, cadmium, copper, lead, nickel, and zinc in conjunction with WET testing is a standard requirement that is included in NPDES permits issued to all POTWs in New England that include WET testing requirements and is also a component of the EPA Region I Freshwater Acute and Chronic WET testing protocols, due to the likelihood for these metals to be present in the effluent discharged from a POTW. EPA includes monitoring for the parameters referenced above due to the risk of toxicity associated with discharges from domestic and industrial sources, and the commenter does not identify any water quality-based rationale for removing them. This requirement is not a substitute for any of the quality assurance and control procedures followed by the laboratory conducting the testing. The requirement in the Final Permit for the analyses of these additional parameters in conjunction with WET testing remains unchanged from the Draft Permit.

Comment B.10.

Footnote #3

Footnote #3 should be deleted from the permit. Part I.B.5. of the permit outlines the requirements for Effluent Limitations and Monitoring Requirements for the Wet Weather Flow Treatment Facility (WWFTF) discharge. The permitted compliance point for the NWTF consists of wet weather discharge, blended effluent and secondary treated effluent. A separate monitoring requirement for the secondary treated effluent does not meet the intent of EPA's policy on wet weather discharges. The removal of this footnote is supported by the Eighth Circuit Decision Iowa League of Cities versus Environmental Protection Agency, filed March 25, 2013 (refer to Section 6 of this letter).

Response B.10.

The requirements of footnote # 3 to Part I.B.5.a. (page 14 of 28) of the Draft Permit, which requires the percent removal of TSS in the effluent discharged from the Wet Weather Flow Treatment Facility to be maintained at a minimum of 80 percent, pertains to an internal outfall which does not discharge to the receiving water, but rather discharges to another treatment process before being discharged to the Merrimack River through Outfall No. 001, where the discharge is subject to effluent limitations. EPA has concluded that the Draft Permit requirements as originally proposed are not necessary in this case. Therefore, footnote # 3 to Part I.B.5.a. of the Draft Permit has been removed from the Final Permit, as has the monthly average effluent limitation for TSS that was included in Part I.B.5.a. of the Draft Permit

Comment B.11.

Footnote #12
Footnote #12 should be deleted from the permit. Language for reopening the permit is contained in NPDES Part II.A.2., Standard Conditions. A reopener clause specific to the NWTF is not justified.

Response B.11.

Footnote #12 has been removed from the Final Permit since Part II.A.4. contains reopener provisions for the permit.

Comment B.12.

Footnote #15 (shown as Footnote #2 in Draft Permit on page 5/28)
Footnote #15 should be removed from the permit. The Effluent Limitations and Monitoring Requirements are intended specifically to protect water quality. An extra statement that *"The discharge shall not cause or contribute to a violation of the water quality standards of the receiving water"* is not warranted.

Response B.12.

The language contained in Part I.A.2. of the Draft Permit is included in all NPDES permits issued to POTWs in New Hampshire, and remains unchanged in the Final Permit. While it is true that the permit is written to include limitations and conditions to assure compliance with water quality standards, EPA cannot reasonably be expected to anticipate all the water quality issues arising from the discharge. The CWA does not proscribe permit conditions stated in terms of water quality standards. EPA sees merit in including a more general, narrative, preventative permit provision that restates the commands of Section 301 and the implementing regulations at 40 C.F.R. §§ 122.4 and .44 to "ensure" compliance with quality standards. Doing so allows EPA to address, as necessary, ongoing water quality impairments caused or contributed to by such circumstances as changes in effluent quality that might otherwise meet permit conditions or the discharge of pollutants not identified in the City's permit application

Comment B.13.

Footnote #16 (shown as Footnote #3 in Draft Permit on page 5/28)
This footnote should be revised to be consistent with the New Hampshire narrative criteria for foam, as follows:

> *The discharge shall not contain substances that would settle so as to form harmful deposits or float as foam, debris, scum or other visible substances. The discharge shall not contain substances that produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render it unsuitable for its designated uses.*

Response B.13.

The language contained in Part I.A.3. of the Draft Permit is from the General Water Quality Criteria contained within the New Hampshire Water Quality Standards at Env-Wq 1703.03, and remains unchanged in the Final Permit.

Comment B .14.

Part I.A.1. Footnote #17 (shown as Footnote #4 in Draft Permit on page 6/28)
The language as currently stated in this footnote regarding 85 percent removal of TSS and BOD during dry weather is not protective of our facility due to the wet weather flow issues. EPA's definition of dry weather should not be used as a surrogate for dry weather flow conditions. CSO policy and guidance refer to dry weather flow as containing only non-precipitation flow. The NWTF requires at least 24 hours for the hydrograph from a storm event to leave the collection system and treatment facility. In addition, stored volumes from the Storage Facility and the Screening and Disinfection Facility will also impact influent flow totals. During this period, the facility meets all Effluent Limitation requirements; however, the influent flow is still dilute enough to violate the 85 percent removal requirements. As such, the following language changes are requested to this footnote:

> *The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt, and at least 24-hours after a storm event to allow the storm-flow hydrograph to pass through the collection and treatment facilities. The percent removal shall be calculated as a monthly average using the influent and effluent BOD_5 and TSS values collected during dry weather days.*

Response B.14.

The footnote referred to in the above comment actually pertains to the language contained in Part I.A.4., which requires the minimum 30-day average percent removal of BOD_5 and TSS be no less than 85% during periods of dry weather[4]. Dry weather is defined in Part I.A.4. of the Draft Permit as "*any calendar day on which there is less than 0.1 inch of rainfall and no snow melt*".

EPA has modified the definition of dry weather found in Part I.A.4. and I.B.2.d. of the Final Permit in response to the commenter's concern regarding the length of time it may take for increased flows resulting from wet weather events to pass through the collection system (and treatment facilities). To remove any ambiguity associated with the time for the storm-related flow (as recorded by a hydrograph) to pass through the collection system, the suggested language

[4] The provisions of 40 CFR § 133.103(a) allows for the application of an exception to the 85% BOD_5 and TSS removal requirements of 40 CFR § 133.102(a)(4)(iii) and (b)(3) in the event that a treatment works receiving flows from combined sewers is not able to achieve this level of BOD_5 and TSS reduction during wet weather.

in the above comment of "*at least 24-hours*" was changed to "*24 hours*" in Part I.A.4. of the Final Permit, which has reads as follows (modified language is in bold):

> "*The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt (defined as a day in which the temperature is greater than 32º F), and* ***24 hours after a storm event to allow the storm-related flow to pass through the collection system and treatment facilities (as recorded by a hydrograph)****. The percent removal shall be calculated as a monthly average using the influent and effluent BOD_5 and TSS values collected during dry weather days*."

Comment B.15.

Request for New Footnote to Part I.A.1.

The operation of our secondary treatment facility is outlined in our High Flow Management Plan dated September 30, 2010 and approved by EPA Region 1. We request the following language be added as a footnote to Part I.A.1:

> *The secondary treatment facility will be operated in accordance with the EPA-approved City of Nashua High Flow Management Plan.*

Response B.15.

A special condition has been added to the Final Permit that requires the operation of the wastewater treatment facility and the wet weather flow treatment facility during periods of wet weather to be consistent with the City of Nashua's High Flow Management Plan (HFMP), dated 2010, or the most recently–approved version of the HFMP. See Part I.C. of the Final Permit.

Part I.B.1. Combined Sewer Overflows

Comment B.16.

Definition of Dry Weather

EPA's definition of dry weather should not be used as a surrogate for dry weather flow conditions. CSO policy and guidance refer to dry weather flow as containing only non-precipitation flow. For the purposes of determining the applicability of the 85 percent removal requirement and what constitutes a dry weather overflow, the EPA's definition is overly restrictive. Nashua should be allowed to determine on a case-by-case basis whether the system flows contain precipitation-derived flow. The language in the first paragraph of Part I.B.1. should be revised to read, *"…These discharges are authorized only during wet weather (i.e., any period in which there is greater than 0.1 inches of rain and/or snow melt and at least 24-hours after a storm event."* For permit consistency, please refer to our comment in Section 2 of this letter regarding Footnote #17.

Response B.16.

EPA disagrees that the City should be given the discretion to determine on its own accord whether the system flows contain precipitation-derived flow. EPA believes an objective benchmark should be utilized to prevent confusion and to set clear expectations.

As discussed in Response B.14., EPA has made changes to the definition of dry weather in Part I.A.4. and I.B.2.d. of the Final Permit to accommodate the City's concerns regarding the time it may take for flows resulting from wet weather events to pass through the collection system and treatment facilities.

Comment B.17.

Part I.B.1.c.
We request that the language for reviewing and updating the Nine Minimum Controls (NMC) be changed to read *"within twelve months of the effective date of the permit".*

Response B.17.

The language contained in Part I.B.1.c. of the Final Permit has been changed to read as

> "***Within twelve months of the effective date of the permit****, the permittee shall review and update (as necessary) its program for implementing the Nine Minimum Controls, and shall submit to EPA and NHDES updated documentation of this program, which shall include a certification that this review has been performed and a description of any resultant revisions made to the program. EPA and NHDES consider that approvable documentation must include the minimum requirements set forth in Part I.B.2. of this permit and additional activities the permittee can reasonably undertake."*

Comment B.18.

Part I.B.1.d.
The Long Term Monitoring Plan requirements are intended specifically to protect water quality. If the CSO discharge is in compliance with the Long Term Monitoring Plan and the Effluent Limitations, then the City is in compliance with water quality standards. An extra statement that "*The discharge shall not cause a violation of the water quality standards of the receiving stream*" is not warranted and leaves the City and EPA vulnerable to third party lawsuits.

Response B.18.

The requirement that "The discharge shall not cause a violation of the water quality standards of the receiving stream" is consistent with the national CSO Control Policy, which requires that permits issued to CSO communities require permittees to comply with applicable water quality standards no later than the date allowed under the State's water quality standards, which has lapsed. 59 FR 18688. This requirement is expressed in the form of a narrative limitation, again consistent with the Policy, and shall remain in the Final Permit. See also Response B.12.

PART I.B.2. NINE MINIMUM CONTROL IMPLEMENTATION LEVELS

Comment B.19.

The Nashua NPDES permit contains provisions for Nine Minimum Controls (NMCs) for CSOs. A side-by-side comparison was performed with the year 2000 permit. The comparison indicated that Part I.B.2.a. to Part I.B.2.f. are similar to the previous permit with the exception of paragraph d., which addresses dry weather overflows and paragraph f., which includes the requirement for signs at CSO outfalls. Part I.B.2.g. and Part I.B.2.h. are new paragraphs to the 2013 Draft Permit addressing public notification and annual reporting, respectively.

The bulk of these requirements were carried over from the previous permit. These requirements are not consistent with either the Combined Sewer Overflows Guidance for Nine Minimum Controls (EPA, May 1995, 832-B-95-003) or the Combined Sewer Overflows Guidance for Permit Writers (EPA, August 1995, 832-B-95-008). The permit requires that Nashua review and update, if needed, its program for implementing the NMCs and that the program incorporate the Nine Minimum Control Implementation Levels outlined in Part I.B.2. of the permit as a threshold for EPA approval. These requirements are very prescriptive and could hardly be considered minimal. Additionally, some of the requirements are not appropriate given the circumstances of Nashua's CSO discharges. Appendix A of the CSO permit writers' guide provides example permit conditions for Phase II CSO permits. In this guidance, EPA organizes the permit conditions by each NMC along with the documentation necessary to evaluate compliance.

Part I.B.2. Nine Minimum Control compliance language should be revised for consistency with federal guidance. The Part I.B.2. language should be streamlined and appropriate for Nashua's system and CSO discharges as follows:

a. The permittee shall implement the nine minimum controls in accordance with the documentation provided to EPA and NHDES under Part I.B.1. of this permit, or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the item s listed below (Part I.B.2.) plus any other controls the permittee can feasibly implement as set forth in the documentation.

b. Properly Operate and Maintain the Collection System

    i. Adequate management, staffing and funding. The permittee's Nine Minimum Control Plan shall document the resources allocated (manpower, funding, equipment and training) to system operation and maintenance.

c. Inspection and Maintenance. The permittee shall inspect each CSO structure/regulator, and/or pumping station at a frequency necessary to ensure good working condition and compliance with the NMC. The permittee's Nine Minimum Control Plan shall document the inspection procedures to include: frequency of inspections, date/time, facility condition and any maintenance performed. The permittee shall maintain records of all inspections for a minimum of three years.

d. Maximize Use of the Collection System for Storage.

   i. The permittee shall maintain all dams, diversion structures or regulator settings to minimize discharge from the CSO outfalls and shall keep them free from obstructions.

   ii. The permittee shall evaluate measures that retard inflows and provide upstream detention.

   iii. The permittee's Nine Minimum Control Plan shall document alternatives considered for maximizing storage and the actions taken to do so.

e. Review and Modify Pretreatment Program

   i. The permittee shall evaluate the potential for non-domestic dischargers to impact CSO discharges and make necessary modifications to the pretreatment program.

   ii. The permittee's Nine Minimum Control Plan shall document evaluations and any modifications to the pretreatment program.

f. Maximize Flow to the NWTF

   i. The permittee shall operate the NWTF at the maximum level during wet weather flow conditions.

   ii. The permittee's Nine Minimum Control Plan shall document the actions taken to maximize flow and describe any changes to further maximize flow.

g. Prohibit Dry Weather CSOs.

   i. The permittee shall monitor the system for dry weather overflows (overflows that occur in the absence of wet weather flow conditions). Should a dry weather overflow occur, the permittee shall immediately begin corrective action.

   ii. The permittee's Nine Minimum Control Plan shall document and describe alternatives considered and actions taken to identify and correct dry weather overflows. The plan should also include procedures for notifying permitting authorities of dry weather overflows.

h. Control Solid and Floatable Materials

   i. The permittee shall implement measures that could include baffles, trash racks, static screens, catch basin controls, nets, booms, etc. to control solids and floatable materials in CSOs.

   ii. The permittee's Nine Minimum Control Plan shall document the procedures or technologies considered, a description of the controls implemented and plans for any future controls.

i. Implement a Pollution Prevention Program

   i. The permittee shall implement a pollution prevention program to reduce pollutants in CSO discharges. The program should include elements such as street cleaning, public education, product bans/use control and waste/refuse management.

   ii. The permittee's Nine Minimum Control Plan shall document the alternatives considered, the measures implemented and the expected benefit of the selected controls.

j. Notify the public of CSOs.

   i. The permittee shall implement a public notification plan to include adequate signage at CSO outfall points and other methods of notice including the use of media, mailers and the internet.

   ii. The permittee's Nine Minimum Control Plan shall list and describe the measures planned for implementation, the location where signs are posted along with the information provided on the signs and the procedures for issuing notices.

k. Monitor to Characterize CSO Impacts and the Efficacy of CSO Controls

   i. The permittee shall monitor CSO outfalls and determine any other information needed to properly characterize the system, CSO impacts and the effectiveness of control measures.

   ii. The permittee's Nine Minimum Control Plan shall include relevant information and data as well as any evaluation of that information in terms of CSO impacts and control efficacy.

Response B.19.

The commenter merely asserts that the permit is inconsistent with the *Combined Sewer Overflows Guidance for Nine Minimum Controls* (EPA, May 1995, 832-B-95-003) or the *Combined Sewer Overflows Guidance for Permit Writers* (EPA, August 1995, 832-B-95-008), which does not provide grounds to revise the Draft Permit provisions, and is mistaken in the belief that mini*mum* CSO controls must be mini*mal* and non-prescriptive. The requirements in Part I.B.2. of the Draft Permit contain elements of both a Phase I and Phase II NPDES permit, which, contrary to the above comment, are consistent with the 1994 CSO Control Policy as well as subsequent guidance developed for the implementation of this policy. While the expectation of the national CSO Control Policy is that the incorporation of CSO controls in NPDES permits will occur through a two-phased approach, it is oftentimes difficult to distinguish between Phase I and Phase II. The CSO Control Policy recognizes this and as such, is designed to accommodate variations in the design and implementation of CSO controls. As a result, NPDES permits issued to CSO communities often include requirements of both a Phase I and Phase II permits.

The above comment does not provide an explanation as to why some of the requirements in Part I.B.2. of the Draft Permit are not appropriate given the "circumstances of Nashua's CSO discharges". The permit conditions outlined in Appendix A of the *CSO Guidance for Permit Writers* (USEPA September 1995 [EPA 832-B-95-008]) and referenced extensively in the above comment, are, as the title implies, "Compilation of Example CSO Permit Conditions," and are not intended to be applied to each and every CSO permit without first giving due consideration to the specific details of each CSO community.

Most, if not all, of the items included in the commenter's suggested language for Part I.B.2., or their substantive equivalent, are found in the Draft Permit. These requirements (Part I.B.2. of the Draft Permit), were developed in accordance with the national CSO Control Policy and were established following an evaluation of the measures taken by the City to control discharges from CSOs as well as the impacts of wet weather-related flows on the combined collection system. CSOs are a very serious environmental and public concern, and the requirements in the permit are designed to address them in an effective manner, which many times includes prescriptive conditions so that EPA and the public can be assured that specific steps will be taken to prevent their occurrence and/or mitigate their impacts as expeditiously as possible. The requirements in Part I.B.2. of the Draft Permit remain unchanged in the Final Permit.

Comment B.20.

Part I.B.2.g.
The City requests the language for oral CSO discharge notification to NHDES-WD be changed from *"within 24 hours"* to *"the next business day"*.

Response B.20.

The requirements in Part I.B.2.g. of the Draft Permit, requiring the City to provide both oral (i.e., within 24-hours") and written (within 5 days) notification to NHDES of a CSO discharge have been removed from the Final Permit, as discharges from CSOs during wet weather events are authorized under the permit. However, the permittee is still required to notify EPA and NHDES within 24-hours of any CSO discharges that occur during dry weather conditions (see Part I.B.2.d. of the Final Permit). Expeditious notification of dry weather discharges is important given the public health and aquatic life impacts, and requiring notification on the next business day could introduce a significant delay if, for example, the discharge occurs on a Friday.

PART I.B.3. NINE MINIMUM CONTROLS ANNUAL REPORTING REQUIREMENT

Comment B.21.

The previous permit only required the submittal of a certification that CSO discharges were recorded and records maintained. The Draft Permit contains extensive annual report requirements. A few requirements are reasonable, such as records of activation frequencies and volumes of CSO discharged. Other reporting requirements are unclear, such as the requirement to report precipitation data for each day of the year as opposed to only days where a discharge actually occurred. Additionally, other parts of the permit require data collection at rainfall gages

at one-hour intervals while the annual report requires 15-minute intervals in order to calculate peak rainfall intensity. The proposed monitoring requirements appear to attempt to characterize the operation of the collection system prior to the implementation of any controls with the expectation that CSO discharges from this system would not be consistent with the CSO Control Policy. However, the proposed monitoring requirements are not consistent with the CSO Control Policy. CSO discharges are managed through use of the WWFTF at the wastewater plant and the SDF, which are part of Nashua's Long Term Control Plan.

New Hampshire rule Env-Wq 1703.03(c) requires that all CSOs meet an *E. coli* limit of 1,000 colonies per 100 mL at the end of the pipe. Additionally, the *New Hampshire Statewide Total Maximum Daily Load (TMDL) for Bacteria Impaired Waters*, September 2010 states, *"Although meeting ambient bacteria standards at the point of discharge for all sources is the goal of this TMDL, compliance will be based on ambient water quality and not water quality at the point of discharge (i.e., end of pipe). In addition, per Env-Wq 1703.06(c), for non-tidal CSO discharges in Class B waters, a bacteria criteria of 1,000 E. coli/100 mL shall be applied at the end of pipe."* It is clear that the disinfected CSO, WWFTF and SDF discharges will be in compliance with the TMDL and protective of instream uses, including downstream water supply.

Any monitoring and reporting requirements should be established to verify compliance with the effluent limitations, the NMC, and the TMDL. The Part I.B.1. requirement for annual *E. coli* monitoring from CSOs #002-#009 for permit compliance serves this purpose. The annual Reporting requirements in Part I.B.3. should be revised in the Final Permit to only include:

- Duration
- Volume
- Precipitation data (daily including the day prior to a discharge event)
- *E. coli* concentration (when measured)

Response B.21.

The commenter's suggestion that the reporting requirements in Part I.B. of the Draft Permit are inconsistent with the CSO Control Policy are unsubstantiated. As discussed in the Fact Sheet, since issuance of the 2000 permit, the City has implemented several of the CSO controls that were evaluated and selected in their Long Term Control Plan, including partial separation of the combined system, increasing the capacity for the off-line storage of combined flows, screening and disinfection, system optimization measures, and the operation of the Wet Weather Flow Treatment Facility. Based on the information that was available during the development of the Draft Permit, EPA was unable to determine whether wet weather flows are managed in a manner that is consistent with the Nine Minimum Controls (specifically, greater use of the collection system for storage (NMC #2) and return of the flow to the POTW for treatment (NMC #4)), the procedures established in the High Flow Management Plan[5] and the underlying assumptions set

[5] The City of Nashua submitted documentation of its plan for implementing the Nine Minimum Controls, titled "High Flow Management Plan for the Nashua Wastewater Treatment Plant", in November 1999. This document has

forth in the Long Term Control Plan[6]. The data and information collected and submitted in accordance with the monitoring requirements found in Part I.B. of the Draft Permit will allow for a characterization of the collection system and the Wet Weather Flow Treatment Facility to be made, which will assist in evaluating consistency with the NMC, and in turn, to assure compliance with the CSO-related requirements of permit. (CSO control policy, Part II.C.1., p. 18691).

EPA disagrees with the commenter's assertion that Part I.B.1 fully stands in for the more extensive requirements of Part I.B.3. The *E. coli* data that is collected in accordance with Part I.B.I. of the Final Permit will be used to determine compliance with the water-quality based *E. coli* limit, whereas Part I.B.3. of the Draft Permit requires the submittal of an annual report, the elements of which are to include the CSO discharge and precipitation data that were collected in accordance with Part I.B.2. of the permit, which will be used to evaluate compliance with the technology-based limits (i.e., the Nine Minimum controls). As previously stated in this response, the CSO discharge and precipitation data will provide information that is necessary for understanding the operation of the collection system during wet weather and to evaluate compliance with the Nine Minimum Controls (specifically, NMC #2 (maximum use of the collection system for storage), #4 (maximization of flow to the POTW) and #9 (monitoring to effectively characterize CSO impacts and the efficacy of CSO controls)). The data will also provide localized information relative to the conditions that result in discharges from individual CSOs.

EPA agrees with the commenter's contention that the precipitation data collection requirements in Parts I.B.3.c. of the Draft Permit are somewhat unclear. Therefore, the language in Part I.B.3.c. of the Final Permit has been changed to read as "*Precipitation data for each day of the previous calendar year, including total rainfall, peak intensity, and average intensity*".

WET WEATHER FLOW TREATMENT FACILITY AND SCREENING AND DISINFECTION FACILITY

Comment B.22.

The NWTF utilizes Actiflo units as treatment for flows exceeding the hydraulic capacity of the biological treatment facilities. The Draft Permit includes a number of monitoring requirements for this facility prior to blending with the effluent from the biological portion. These requirements in their entirety should be deleted to be consistent with the recent case law pertaining to blending. In a March 25, 2013 decision, the Eighth Circuit United States Court of Appeals found that *"effluent limitations apply at the end of the pipe"* and *"There is no indication that the secondary treatment regulations established situations in which it would be impractical to apply effluent limitations at the end of the pipe…"* The Eighth Circuit Court ruled *that "The EPA may regulate the pollutant levels in a waste stream that is discharged directly to the*

since undergone several revisions, with the most recent revision occurring in April 2010 to include procedures for handling wet weather-related flows at the POTW and Wet Weather Flow Treatment Facility.

[6]The City's Long Term Control Plan (LTCP) was submitted in 2003 (and amended in 2004). Specifically, the Long Term Control Plan predicts that the operation of the WWFTF will result in no untreated overflows in the largest storm in the typical year, or in the 5-year "actual" design storm

navigable waters of the United States through a "point source"; it is not authorized to regulate the pollution levels in a facility's internal waste stream. Therefore, insofar as the blending rule imposes secondary treatment regulations on flows within facilities, we vacate it as exceeding the EPA's statutory authority.

The Draft Permit also includes biochemical oxygen demand (BOD_5) and total suspended solids (TSS) monitoring requirements for the Screening and Disinfection Facility (SDF). The facility was not designed for BOD_5 and TSS removal; therefore, technology-based monitoring requirements are not appropriate. Additionally, the receiving stream is not impaired for dissolved oxygen or suspended solids, so there is no water quality basis for the monitoring requirements. Furthermore, the only controlling criteria in the City's Long Term Control Plan is monitoring and reporting for *E. coli*. EPA Region 1 should not be imposing effluent limitations other than total residual chlorine and *E. coli* on wet weather discharges per the Eighth Circuit Decision Iowa League of Cities versus EPA. The BOD_5 and TSS monitoring requirements should be deleted from the permit.

Response B.22.

As noted in Response B.10, Footnote # 3 to Part I.B.5.a. of the Draft Permit has been removed from the Final Permit and the monthly average effluent limitation of 30 mg/l for total suspended solids ("TSS") found in Part I.B.5.a of the Draft Permit has been changed to a monitor only requirement in the Final Permit. Sampling frequency remains at once per month.

The commenter's assertion that EPA's inclusion of monitoring requirements for the WWFTF and SDF are inconsistent with the cited case law are without merit. The case, which was from the Eighth Circuit, is inapposite. First, the monitoring requirements in Part I.B.5.a. of the Draft Permit, which pertain to the WWFTF, are not effluent limitations, and are not being imposed pursuant to Section 301(b)(1)(B), but instead under Section 308, 402, and the implementing regulations at 40 C.F.R. Part 122, which confer broad authority on EPA to monitor and gather information from POTWs. These monitor-only requirements are necessary to ensure the collection of data that will allow for a determination to be made regarding whether the operation of the facilities are consistent with the objectives and assumptions underlying the LTCP[7]. In addition, this monitoring will provide information necessary for understanding the operation of the collection system during wet weather and will allow for determinations to be made with respect to the effectiveness of its operation consistent with the Nine Minimum Controls.

With respect to the effluent limits and monitoring conditions in Part I.B.5.b. of the Draft Permit, which pertain to the SDF, the *Iowa League of Cities* decision is not applicable. The SDF is a stand-alone facility that does not involve blending with other effluents from the POTW or the WWFTF. This facility has a dedicated outfall which discharges to the Merrimack River. As with the WWFTF, the effluent limitations and monitoring requirements for the SDF are

[7] The specific levels of CSO control for each outfall are described in the Long Term Control Plan (LTCP) submitted by the City in 2003, as amended in 2004. The LTCP predicts that the operation of the WWFTF will result in no untreated overflows in the largest storm in the typical year, or in the 5-year "actual" design storm and that the operation of the SDF will result in no untreated CSOs in response to the largest storm in the typical year or the 2-year or 5-year "actual" storms.

necessary to allow for a determination to be made regarding whether the operation of the facilities are consistent with the objectives and assumptions underlying the LTCP and to provide information necessary for understanding the operation of the collection system during wet weather and will allow for determinations to be made with respect to the effectiveness of its operation consistent with the Nine Minimum Controls.

The requirements in Part I.B.5.a. and b. of the Final Permit remain unchanged from the Draft Permit.

Comment B.23.

Total Residual Chlorine

EPA Region 1 used the Merrimack River 7Q10 for calculating the Water Quality Based Effluent Limit (WQBELs) for the CSO discharges. The CSOs will only discharge during wet weather. EPA's NPDES Permit Writers' Manual indicates that for most pollutants and criteria, the critical flow in rivers and streams is a measure of the low flow of that river or stream; however, the critical condition could be different under a different discharge situation (i.e., a high flow event where a CSO from wet weather event are a significant issue). It is more appropriate to use the 30Q10 flow for reasonable potential during wet weather events. The RPA for total residual chlorine should be revised to reflect the correct dilution.

Response B.23.

Although CSO discharges typically occur as a result of wet weather-related flows, water quality-based effluent limitations must be established using applicable water quality standards. New Hampshire's Water Quality Standards (RSA 485-A:8 VI, Env-Wq 1705.02), require the use of 7Q10 flows for the establishment of water quality based effluent limitations. EPA has explained the water quality-based rationale for employing the 7Q10 flow elsewhere in the RTC. The total residual chlorine limits in Part I.B.5. of the Final Permit, which were based upon the 7Q10 flow of the receiving water, remain unchanged from the Draft Permit.

Comment B.24.

Part I.B.5.a. Footnotes #1, #2, #3, #4, #7 and #8

The Effluent Limitations Table in Part I.B.5.a. should not contain reporting requirements for the flow discharged from the WWTF to the chlorine contact tank or flow drained back to the NWTF. These flows are internal process flows and are not flows discharged to the Merrimack River. Per the Eighth Circuit Court Decisions Iowa League of Cities versus EPA, the Court ruled that the EPA may not impose arbitrary monitoring requirements on internal treatment processes and only end of pipe may be considered. As such, Part I.B.5.a. Footnotes #1, #2, #3, #4, #7 and #8 should be removed from the permit. Additionally, Footnote #9 requiring the City to monitor and report rainfall precipitation should be removed from the permit. Rainfall monitoring is already required as part of the City's Long Term Control Plan.

Response B.24.

See Response B.22.

EPA classified the outfall from the Wet Weather Flow Treatment Facility ("WWFTF") as an "internal outfall," since the effluent from the WWFTF is discharged to the chlorine contact chamber, where it is combined with secondary effluent prior to discharge to the receiving water. EPA included the flow monitoring requirements to better understand whether the WWFTF and bypass are operating in a manner that is consistent with the assumptions in the LTCP.

While EPA acknowledges that the discharge from the WWFTF is not to the receiving water, but rather to the chlorine contact chamber where the effluent is combined with secondary and primary effluents prior to discharge to the receiving water through Outfall No. 001, the flow monitoring requirements contained in Part I.B.5.a. of the permit will ensure that the operation of the WWFTF is consistent with the underlying assumptions contained in the City's Long Term Control Plan (LTCP) that was submitted by the City in 2003, as amended in 2004. Specifically, the LTCP predicts that the operation of the WWFTF will result in no untreated overflows in the largest storm in the typical year, or in the 5-year "actual" design storm. The flow monitoring requirements in Part I.B.5.a. of the Final Permit remain unchanged from the Draft Permit.

With the exception of footnote # 3 to Part I.B.5.a. of the Draft Permit, which has been removed from the Final Permit for the reasons discussed in Response B.10., the requirements in Part I.B.5.a. of the Draft Permit remain in the Final Permit. Footnote #9 to Part I.B.5.a. of the Draft Permit, has been modified in the Final Permit to clarify that precipitation data that is collected in accordance with the LTCP may be submitted to satisfy the requirement in Part I.B.5.a. provided that intensity (inches/hour) and duration (total hours/event) are provided.

Comment B.25.

Part I.B.5.b. Footnotes #1, #2, #3, #4, #5, #9, #10 and #11
The Effluent Limitations Table in Part I.B.5.b. should not contain reporting requirements for flow discharged into the SDF, discharged from the SDF, or flow drained back to the collection system per the Eighth Circuit Decision Iowa League of Cities versus EPA. As such, Part I.B.5.b. Footnotes #1, #2, #3, #4, #5, #9, #10 and #11 should be removed from the permit.

Response B.25.

The effluent from the SDF is discharged to the Merrimack River. Given that the SDF is a stand-alone facility with its own outfall to the Merrimack River and the effluent is not blended, the premise of the comment is incorrect. See Response B.22.

Comment B.26.

Part I.B.5.b. Footnote #12
The requirement to monitor and rainfall precipitation should be removed from the permit, as rainfall monitoring is already required as part of the City's Long Term Control Plan.

Response B.26

The precipitation data that is collected in accordance the LTCP may be used to satisfy the requirement in Part I.B.5.b. of the Final Permit, which remains unchanged from the Draft Permit. See Response B.24.

Comment B.27.

Request for New Footnote in Part I.B.5.a.

The operation of our WWFTF facility is outlined in our High Flow Management Plan dated September 30, 2010 and approved by EPA Region 1. We request the following language be added as a footnote to Part I.B5.b.:

The Wet Weather Flow Treatment Facility will be operated in accordance with the EPA-approved City of Nashua High Flow Management Plan.

Response B.27.

The following language has been added as a Special Condition (Part I.C.) in the Final Permit: "*Operation of the Wet Weather Flow Treatment Facility shall be in accordance with the most current EPA-approved High Flow Management Plan."*

Comment B.28.

Request for New Footnote in Part I.B.5.b.
The operation of our SDF is outlined in our High Flow Management Plan dated September 30, 2010 and approved by EPA Region 1. We request the following language be added as a footnote in Part I.B.5.b.:

The Screening and Disinfection Facility will be operated in accordance with the EPA-approved City of Nashua High Flow Management Plan.

Response B.28.

The operation of the SDF is not described in the HFMP.

Part I.D.4. Collection System Mapping

Comment B.29.

Collection system mapping is a requirement of the Long Term Control Plan, and should not be included as part of the NPDES permit. Part I.D.4. should be removed from the permit.

Response B.29.

The requirements in Part I.D.4. of the Draft Permit are being included in all NPDES permits issued to New Hampshire POTWs, and remain in the Final Permit. EPA does not perceive any drawback from making the requirement enforceable through the NPDES permit, and the permittee does not identify any. A statement has been added to Part I.D.4. clarifying that any mapping of the collection system that has been performed in accordance with the LTCP may be used to fulfill the requirements in Part I.D.4. of the Final Permit.

COLLECTION SYSTEM OPERATION AND MAINTENANCE PLAN

Comment B.30.

Part I.D.5.a.
We request that the schedule for the Collection System Operation and Maintenance Plan be changed from 6 months to 30 months of the effective date of the permit.

Response B.30.

The permittee has up to 24 months from the effective date of the permit to submit the full Collection System Operation and Maintenance Plan. Within the first 6 months of the effective date of the permit, the permittee is required to submit: (1) description of the collection system management goals, staffing, information management, and legal authorities; (2) A description of the overall condition of the collection system including a list of recent studies and construction activities; and (3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in Part I.E.5.b.1. through b.7.

The comments do not provide any reasons or explanation of the need to extend the schedule for the initial submittal of the collection system operation and maintenance plan from 6 to 30 months, therefore Part I.D.5. of the Final Permit remains unchanged from the Draft Permit. If the City wishes to submit a request to extend the deadline along with a justification of the request, EPA will consider an extension of the schedule through a permit modification.

Comment B.31.

Part I.D.5.b.
We request that the schedule for the Collection System Operation and Maintenance Plan submittal to EPA and NHDES be changed from 24 months to 36 months of the effective date of the permit.

Response B.31.

The comments do not provide any reasons or explanation of the need to extend the initial submittal of the collection system operation and maintenance plan from 24 to 36 months, therefore Part I.D.5. of the Final Permit remains unchanged from the Draft Permit. If the City

wishes to submit a request to extend the deadline, along with justification of the request, EPA will consider an extension of the schedule through a permit modification.

The due date for the submittal of the full Collection System Operation and Maintenance Plan in the Final Permit shall remain 24 months from the effective date.

Part I.H. Monitoring and Reporting

Comment B.32.

Part I.H.1.a.
We request that the schedule for submitting Discharge Monitoring Reports (DMRs) electronically using NetDMR be changed from one year to two years of the effective date of the permit.

Response B.32.

Many permittees have not had any difficulty complying with the NetDMR electronic reporting requirements within one year. The City has not provided any justification as to why they would not be able to comply with the NetDMR reporting requirements within one year of the effective date of the permit, therefore, the date on which DMRs are to be submitted electronically using NetDMR has been maintained in the Final Permit. If the City believes that they cannot use NetDMR due to technical or administrative infeasibilities, or for other logistical reasons, and can demonstrate a reasonable basis that precludes the use of NetDMR, they may submit a request to opt out of the NetDMR reporting requirements (i.e., an "opt-out" request) following the procedure in Part I.I. of the Final Permit.

Part I.I. STATE PERMIT CONDITIONS

Comment B.33.

State Permit Condition #5 states that the final effluent pH must be maintained in the range of 6.5 to 8.0 standard units. Please refer to our comment in Section 2 regarding the pH adjustment demonstration project. We request that this note be revised to reflect the new pH effluent permit limit range of 6.0 to 8.0 standard units.

Response B.33.

Please see Response B.7. regarding the pH limit in the Final Permit.

C. COMMENTS FROM THE CITY OF MANCHESTER, NEW HAMPSHIRE

OPENING COMMENT

The City of Manchester is providing the following comments to the Nashua Draft Permit (NH0100170). Manchester's comments will demonstrate that;

1. The EPA & NHDES have an extensive "sound science" document at their disposal, yet deferred to "Reasonable Potential" in setting a phosphorus limit;

2. The NHDES calculated a "Reasonable Potential" loading for phosphorus that will never be attained due to process changes that ensure phosphorus loading reductions at Merrimack and Manchester's WWTPs along with a proposed MS4 Permit that will reduce upstream TP loading significantly;

3. Nashua is a bigger plant than permitted upstream discharges yet Concord was given 90 lbs/month average discharge at 16 mgd design flow. Merrimack was given 168 lbs average monthly discharge and they are a 5 mgd designed facility. Concord was given 204 lbs average monthly discharge and they are designed at 10.1 mgd. There is no continuity in how permits are currently being proposed by the EPA;

4. The NHDES did not follow their "2010 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (CALM) in their "Reasonable Potential" calculation;

5. The most recent extensive Merrimack and Pemigewasset River Study demonstrates that there is no oxygen impairment within the entire length of the Merrimack River. This study indicates that there is no adverse impact from the present phosphorus loadings and subsequent chlorophyll *a* growth as measured and evidenced within the Merrimack River Study;

6. The Copper and Lead limits are within the contamination concentration assumptions as outlined with the CALM (Table 3-32) and therefore do not exhibit potential or "Reasonable Potential" to exceed the WQ criteria;

7. The EPA and NHDES are requiring an unfunded mandate to achieve nutrient and metals removals where scientific study has shown that none are currently required.

Response to Opening Comment

The issues and concerns raised in items one through seven in Manchester's opening comment appear throughout comments C.1. through C.21. and, as such, are addressed in EPA's responses to those comments.

As a threshold matter, the commenter should note that the permit is a federal permit that may be adopted by the state of New Hampshire, meaning that most, if not all, of the actions attributed above to NHDES should actually be attributed to EPA.

Additionally, the commenter should be aware that EPA imposes limits on a case-by-case basis, determined in large part by the size and location of the facility, as well as other site-specific factors. The Region's determination of the effluent limit for the Nashua WWTF is specific to the facility and the particular impacts on its receiving water. The statute and regulations require EPA to set permit effluent limits for each point source at the level that is necessary to ensure compliance with state water quality standards.

The issues and concerns raised in Manchester's opening comment are raised as individual comments and are addressed in EPA's response to those comments below.

Comment C.1.

The Nashua Draft Permit indicates on pg. 10 of 28, item H. that annual notification shall be noticed to the public. Manchester would like to see the method listed to which this must be accomplished as, "The permittee shall issue an annual notification to the public, *via the largest daily circulated newspaper*, which shall include…"

Response C.1

It is unclear why Manchester has requested that annual notification occur in the specific manner identified above, which will result in increased costs to be borne by Nashua with marginal added benefit. EPA does not believe that public notice has to occur via the largest daily circulated newspaper in order to accomplish the objective of notifying the public of the occurance of a CSO discharge. Utilizing the largest daily circulated newspaper to issue the annual notification required by Part I.B.2.g. of the Final Permit is, of course, one reasonable means the City may employ to satisfy the permit condition.

Comment C.2.

TOTAL PHOSPHORUS LIMIT

The permit pg 3 of 28 lists a monthly average for total phosphorus of 0.06 mg/l between April 1st and October 1st. There are a number of factors that play into this determination which will be discussed in sequence. Attachment B of the Draft Permit outlines how the 7Q10 is calculated with a resulting 7Q10 downstream flow of 784.1 cfs. The upstream 7Q10 is 759.4 cfs.

Table 4, on pg. 22 of 36, outlines two upstream sampling dates. The dates listed on table 4 are 10/5/2007 and 7/27/2010. The 10/5/2007 sample date has two short comings. It falls outside the proposed permit compliance dates of April 1st through October 1st. Second it is beyond the five-year data age requirement as outlined in the EPA approved NHDES CALM of five years (10/5/2012 five-year period end date and Nashua's Draft Permit was prepared in 2013). There is another sample available for 9/21/2010 which should have been calculated in Table 4 and the October 2007 data point should be removed from this subset. By following the criteria in the

NHDES CALM and including the data point from 9/21/2010, with a Chlor-a of 2.0 µg/l and a TP of 67 µg/l. Table 4 should read as follows:

Station	Date	Chlor-a µg/l	TP µg/l
02M-MER	7/27/2010	20.85	36
M070*	9/21/2010	2	67
MIN		2	67 [8]
MAX		20.85	67
AVG		11.425	51.5
Median		11.425	51.5

A map is included in Attachment 1 that demonstrates that M070 is synonymous with 02M-MER and the mentioned 03-MER of the 10/5/2007 sample.

Response C.2.

The monthly average total phosphorus limit contained in Part I.A.1. of the Draft Permit is 0.6 mg/l, not 0.06 mg/l as the stated in the above comment. With the exception of the first paragraph in the above comment, it is assumed that the commenter's references to the Draft Permit and the attachments to the Draft Permit are actually intended to reference the Fact Sheet and the attachments to the Fact Sheet which accompanied the Draft Permit.

Although the period in which the total phosphorus limit is effective was correctly identified as April 1st – October 31st in the Fact Sheet, it was incorrectly identified in Part I.A.1. of the Draft Permit as April 1st – October 1st. The Final Permit has been changed to reflect the correct period in which the total phosphorus limit is in effect as April 1st - October 31st.

While EPA agrees that the upstream total phosphorus data collected at station M070 (NHDES station 02M-MER) on 9/21/2010 should have been included in the reasonable potential analysis that was presented in the Fact Sheet, the commenter's argument that the phosphorus data collected on 10/5/2007 should be excluded from the analysis because it "falls outside of the permit compliance date" and is "beyond the five-year data age requirement as outlined in the EPA approved NHDES CALM of five years" is flawed. Sections 301 and 402 of the Act, and implementing regulations at 40 C.F.R. § 122.44(d), are the provisions that govern this permitting action, not Section 303(d) and associated non-binding listing guidance such as the CALM. Pursuant to those provisions, EPA is authorized to consider the best information reasonably available at the time of permit issuance, and is not bound by any definitive limitations regarding the age of data in making its permitting judgments. As described in the Fact Sheet, EPA reviewed data collected from March 2007 through March 2012 during the development of the Draft Permit. Therefore, EPA's inclusion of data collected on 10/5/2007 in its analysis is appropriate since this date falls within the selected data review period and is also within the season in which the proposed phosphorus limit would be in effect.

[8] [The minimum total phosphorus value in the comment was 67 – but it should be 36.]

The summary of the results of instream chlorophyll *a* and total phosphorus analyses conducted on samples collected within the segment of the receiving water into which the Nashua WWTF discharges (both upstream and downstream from the discharge) between 2005-2011 by NHDES as part of their Ambient River Monitoring Program (ARMP), and in 2010 by the Unites States Army Corps of Engineers (USACE) as part of the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (USACE December 2012 (prepared by CDM))[9] that was presented in Table 4 of the Fact Sheet has been revised to include the data collected upstream from the discharge at station 02M-MER on 9/21/2010, and is shown below in Table 5. Inclusion of the 9/21/2010 data yields a median upstream phosphorus concentration of 67 µg/l (0.067 mg/l).

Table 5 Instream Chlorophyll *a* and Total Phosphorus Concentrations Upstream From the Nashua WWTF

Station[1]	Date	Chlorophyll *a* (µg/l)	Total Phosphorus (µg/l)
Upstream of Nashua WWTF			
03-MER	10/5/2007	0.2	110
02M-MER	7/27/2010	20.85	36
02M-MER	9/21/2010	2	67
Min.		**0.2**	**36**
Max.		**20.85**	**110**
Avg.		**7.68**	**71**
Median		**2**	**67.0**

[1]Sampling Stations: 03-MER -1.2 miles upstream of Nashua WWTF, Rt. 111 bridge, E. Hollis St., Nashua
02M-MER (M070) - approximately 100 feet upstream of Nashua WWTF;

Following the approach described in the Fact Sheet to determine whether or not reasonable potential exists for the discharge from the Nashua WWTF to cause or contribute to violations of water quality standards, the median of the upstream data (0.067 mg/l) and the maximum concentration of total phosphorus that was detected in samples of the effluent[10] (2.16 mg/l) were applied to a mass balance equation to project a downstream phosphorus concentration of 0.133 mg/l, as shown below.

[9]NHDES ARMP OneStop database
Upper Merrimack and Pemigewasset River Study Monitoring Data Report (U.S. Army Corps of Engineers December 2012) (prepared by CDM) ftp://ftp.usace.army.mil/pub/nae/UMRB-REPORTJAN2011/UMPRS_Year1%20Data%20Report%20Appendix_Jan2011.pdf

[10] The maximum concentration of total phosphorus detected in samples of the effluent that were analyzed in conjunction with the *Upper Merrimack and Pemigewasset River Study*, U.S. Army Corps of Engineers, January 2011. There was one inadvertent reference in the fact sheet to the maximum effluent concentration of total phosphorus being 2.55 mg/l. The maximum effluent concentration from the *Upper Merrimack and Pemigewasset River Study* was 2.16 mg/l.

$$Q_dC_d + Q_sC_s = Q_rC_r$$

Where:

C_r = resultant downstream phosphorus concentration (mg/l)
Q_d = effluent flow (design flow = 16 mgd = 24.75 cfs)
C_d= maximum effluent phosphorus concentration (2.16 mg/l)
Q_s = upstream 7Q10 flow (759.4 cfs)
C_s = median instream phosphorus concentration, upstream from the discharge (0.067 mg/l)
Q_r = 7Q10 flow just downstream from the discharge (784.1 cfs)

$$C_r = (Q_sC_s + Q_dC_d) / Q_r$$

$$C_r = [(759.4 \text{ cfs} * 0.067 \text{ mg/l}) + (24.75 \text{ cfs} * 2.16 \text{ mg/l})] / 784.1\text{cfs} = 0.133 \text{ mg/l}$$

The projected downstream concentration of 0.133 mg/l is greater than the instream target of 0.090 mg/l (the Gold Book Criterion of 0.100 mg/l multiplied by a factor of 0.9 to reserve 10% of the assimilative capacity of the receiving water in accordance with the New Hampshire Water Quality Standards, see Env-Wq 1705.02) determined by EPA to represent a protective instream target based on EPA guidance and other relevant information in the administrative record, indicating that reasonable potential exists for the discharge of phosphorus from the Nashua WWTF to cause or contribute to violations of water quality standards in the downstream receiving water.

The commenter implies that had EPA used an upstream phosphorus concentration of 51.5 µg/l, there would be no reasonable potential for the Nashua WWTF to cause or contribute to violations of water quality standards. This is simply not the case, as application of an upstream phosphorus concentration (C_s) of 51.5 µg/l to the mass balance equation shown above results in a projected downstream concentration of 0.12 mg/l, which is greater than the instream target of 0.09 mg/l, as shown below.

$$C_r = [(759.4 \text{ cfs} * 0.0515 \text{ mg/l}) + (24.75 \text{ cfs} * 2.16 \text{ mg/l})] / 784.1\text{cfs} = 0.12 \text{ mg/l}$$

Because there is reasonable potential for the concentration of phosphorus discharged from the Nashua WWTF to cause or contribute to violations of water quality standards, the Final Permit includes a seasonal monthly average total phosphorus limit, which EPA has determined to be 0.8 mg/l, in accordance with 40 C.F.R. § 122.44(d)(1)(vi). This limit was calculated (see equation below) by rearranging the mass balance equation shown above and solving for C_d, which is the maximum allowable concentration of phosphorus that may be discharged and still meet the instream concentration target derived by EPA under § 122.44(d)(1)(vi) to implement the narrative nutrient criteria. This is an average monthly limit, which is in effect from April 1st – October 31st.

$$C_d = (Q_r C_r - Q_s C_s)/Q_d$$

Where:

C_d= maximum effluent phosphorus concentration (limit) (mg/l)
C_r = resultant downstream phosphorus concentration, equal to Gold Book criterion * 0.9 (0.090 mg/l)
Q_d = effluent flow (design flow = 16 mgd = 24.75 cfs)
Q_s = upstream 7Q10 flow (759.4 cfs)
C_s = median instream phosphorus concentration, upstream from the discharge (0.067 mg/l)
Q_r = 7Q10 flow just downstream from the discharge (784.1 cfs)

$$C_d = [(784.1 \text{ cfs} * 0.090 \text{ mg/l}) - (759.4 \text{ cfs} * 0.067 \text{ mg/l})]/24.75 \text{ cfs} = 0.800 \text{ mg/l}$$

Comment C.3.

The Phosphorus section in the Fact Sheet says, *"nutrients can promote the growth of nuisance algae and rooted aquatic plants and that elevated levels of nutrients will cause excessive algal and/or plant growth resulting in reduced water clarity, poor aesthetic quality and impaired aquatic habitat which in turn reduces in-stream dissolved oxygen concentrations."*

The Nashua Draft Permit requires an average monthly total phosphorus limit of 60 pounds (16 mgd design flow and 0.6 mg/l monthly average discharge of TP). *The actual median in-stream phosphorus concentration is 51.5 µg/l. By adding the effluent concentration (after dilution) to the new background concentration, there is potential to be at 130 µg/l (corrected calculation, pg. 23 of 36 of the Fact Sheet). NHDES States, "This indicates that reasonable potential exists for the discharge of phosphorus from the Nashua WWTP to cause or contribute violations of the WQ standards in the downstream receiving water."* As attested within these comments, there is currently no impairment within the Merrimack River caused by TP. There is also an omission by the EPA in not reviewing the current and future nutrient reductions from the "Reasonable "Potential" calculations as permits and process changes are happening just upstream of the Nashua WWTP.

Response C.3.

The above comment includes several inaccurate statements. First, the Draft Permit does not contain a mass-based limit for total phosphorus, as implied in the above comment.

Secondly, as described in Response C.2., by applying a median upstream concentration of 67 µg/l (which includes the data collected on 9/21/2010) to the reasonable potential analysis, the projected concentration of total phosphorus that can be expected to occur downstream from the Nashua WWTF under critical flow conditions is 0.133 mg/l, which is greater than the in stream target of 0.090 mg/l (the Gold Book Criterion of 0.100 mg/l multiplied by a factor of 0.9 to reserve 10% of the assimilative capacity of the receiving water in accordance with the New Hampshire Water Quality Standards found at Env-Wq 1705.02). Therefore, reasonable potential exists for the discharge to cause or contribute to violations of water quality standards.

Lastly, the listing of the Merrimack River as impaired for chlorophyll *a* in the 303(d) listing (in conjunction with the water quality data and analysis underlying this finding) as well as the findings of the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (USACE December 2012)) are indications that the River is being negatively impacted by nutrients.

A more detailed response regarding "current and future nutrient reductions" may be found in Responses C.4. and C.6.

Comment C.4.

The City of Nashua's permit indicated that they had a reasonable potential of discharging 340.3 lbs of TP to the Merrimack River on a peak design day (16 mgd at 2.55 mg/l TP). The Town of Merrimack is now using the Block and Hong process for removal of TP. They have been consistently able to reduce their loads over this summer's operating range by > 50% and that is without any chemical addition. In the Merrimack Permit the EPA stated that the reasonable potential for the Merrimack Discharge was 594 lbs TP (5 mgd at 14 mg/l TP) or an instream concentration of 0.212 mg/l. The Merrimack WWTP has experimented with biological nutrient removal over the summer period of 2013. The average discharge is 6 mg/l with a flow of 1.8 mgd. This is an actual discharge of 90 lbs TP. This is the expected future maximum as there is little to no growth foreseen within the community over the next couple of years. Their Draft Permit allowed a daily average of 168 lbs. of discharge per day as a permit limit. The monthly mas loading calculates to an average daily phosphorus discharge of 4mg/l at 5 mgd. Nashua's Draft Permit is for $1/6^{th}$ of the TP discharge that was allocated within Merrimack's discharge permit a few months prior. A question is why is there such a disparity between the TP allocation between two municipalities that are within 10 miles of each other along the same stretch of the river? The City of Concord was permitted for 2.42 mg/l of TP discharge at and design flow of 10.1 mgd. That is a loading of 203.8 lbs of TP that is > 2 times the allowable mass loading given to Nashua

The Town of Merrimack has proven that there can be a 500 lb reduction under their "Reasonable Potential" maximum TP load calculation as outlined in their Draft Permit. This proves that the "Reasonable Potential" condition is extremely conservative, has no basis in scientific fact, and can never transpire within Nashua's permit period.

Response C.4.

The contention that EPA may not establish a phosphorus limit that is inconsistent with the limitations in permits issued to upstream municipalities is without basis. The Region takes into account site-specific circumstances particular to each discharge before imposing an effluent limitation. In determining the need for a permit limit, EPA accounts for the concentration of a given pollutant in the effluent (discharge concentration); the percentage of effluent in the receiving water immediately downstream of the discharge under the critical low flow conditions identified in the state water quality standards (available dilution); and the concentration of pollutants upstream of the discharge (background) to determine how much the discharge can

contribute such that the resulting mix downstream does not exceed the criterion. *NPDES Permit Writers' Manual*, Chapter 6 ([EPA-833-K-10-001], USEPA September 2010).

The monthly average limit of 165 lbs/day that is contained within the permit that was recently issued to the Merrimack WWTF, which discharges to the Merrimack River upstream of Nashua, was established upon finding that there is reasonable potential for the discharge to exceed the Gold Book value based upon an analysis of site-specific parameters, including the receiving water 7Q10 flow, background total phosphorus levels, the design flow of the facility and the concentration of total phosphorus detected in the effluent. In making reasonable potential determinations, EPA models the effect of a discharge under critical conditions through the application of the maximum effluent concentration, median upstream concentration, and critical flow values (i.e., receiving water 7Q10 flow and effluent flow equal to the design flow) to its analysis. As such, EPA would not expect a substantial reduction in downstream total phosphorus concentrations unless the **average** discharge from an upstream point-source is reduced. Based on an average seasonal flow of 2.17 mgd and an average effluent total phosphorus concentration of 6.5 mg/l (based on data collected from April through October over the last five years), the current average phosphorus loading from the Merrimack WWTP is 118 lbs/day. Hence, although the limit does effectually prevent future increases in total phosphorus while limiting the upper extreme of current loadings, it is not expected to result in a significant reduction from current average loadings. As such, a substantial reduction in the instream phosphorus concentration upstream from the Nashua WWTF would not be expected as a result of the recently-issued Merrimack permit.

The conclusions drawn by the commenter regarding upstream reductions, which are based upon a comparison of the current average loading (from the summer of 2013) of 90 lbs/day (based on an **average** effluent concentration of 6 mg/l and an average effluent flow value of 1.8 mgd), to the **maximum** potential loading of 594 lbs/day (based upon a maximum effluent concentration of 14 mg/l and a maximum effluent flow value of 5 mgd), are not appropriate because the effluent values are based on different averaging periods.

In conclusion, the discharge of phosphorus from the Merrimack WWTF in quantities equal to the permitted load (165 lbs/day) will be well above their current average discharge load of 118 lbs/day, and is not likely to result in a substantial reduction in upstream phosphorus concentrations just upstream from the Nashua WWTF.

Comment C.5.

Manchester is in the process of installing a Modified Johannesburg Process for biological phosphorus removal. Manchester currently discharges 477 lbs of TP to the Merrimack on an average day (22 mgd at 2.6 mg/l TP). Bio-Win modeling has demonstrated that Manchester will consistently achieve a 1 mg/l or less TP effluent discharge with bio-P removal. That would mean a reduction to 183 lbs of TP to the Merrimack River on an average day (294 lb reduction from current loading levels). This reduction taken with the 500 lbs actualized reduction from "Reasonable Potential" expectation from Merrimack's discharge is almost 800 lbs TP removed from the future "Reasonable Potential" load into the Merrimack River daily.

Response C.5.

EPA agrees that the reduction in average total phosphorus loadings from the Manchester WWTF as described above could substantially improve downstream total phosphorus concentrations. However, at this time this reduction has not been realized, since the treatment technology described above is not yet active. Hence, EPA is required to make permitting decisions using information that is currently available.

Comment C.6.

An 800 lb "Reasonable Potential" actualized reduction with a 7Q10 flow rate of 789 cfs (509 mgd) downstream of Nashua provides for 0.188 mg/l removal of TP from the Merrimack River. This is greater than the 0.139 calculated "Reasonable Potential" limit outlined in the Nashua Draft Permit. It would leave an in stream loading of 0.024 mg/l from the Reasonable Potential discharge from the Town of Merrimack's Draft Permit (212 μg/l maximum facility discharge at 5 mgd with a concentration of 14 mg/l). This does not include the TP reductions that will be achieved by the pending MS4 permits that will require TP reductions from all communities south of Concord. The EPA is only looking at the potential additions to the Merrimack River, but has not factored in the real reductions that have transpired since the 2010 sampling and will transpire over this permit period. It is impossible to reach any of the in stream "Reasonable Potential" conditions as outlined in the Nashua or Merrimack Draft Permits.

Response C.6.

As described above, the 800 lb reduction referred to by the commenter does not represent an actual reduction in upstream loadings. The reduction attributed to the Merrimack WWTF is not based on average loadings and the reduction attributed to Manchester is based on an expected reduction resulting from a treatment plant upgrade that has not been implemented as of yet. Similarly, any pending MS4 permits which are not currently being implemented to reduce total phosphorus loadings in the proximity of the Nashua discharge would not be applied in this analysis. In summary, the Nashua permit limit was developed based on site-specific parameters which EPA believes have not been significantly affected by other recent permitting actions in the Merrimack River. Hence, the total phosphorus limit of 0.8 mg/l is established in the Final Permit.

Comment C.7.

As the Army Corps study has demonstrated that the Merrimack River has no current impacts from nutrient or algae impacts, it is safe to say that with the above mentioned TP removals, the Merrimack River quality will only get better (Note that the Phase II study indicates the Merrimack River is currently in compliance with WQ criteria as outlined in the NHDES CALM). There is no reasonable potential for the Merrimack River to be any more impacted from TP loads than what was measured in the Phase II Merrimack Study (prior to the installations of the Block and Hong process at Merrimack and the pending nutrient upgrade at Manchester). This is reason enough to include at a maximum a monitor only provision in the Nashua permit for TP with no concentration or mass based nutrient limit for phosphorus

In Nashua's Fact Sheet, the 303(d) list, primary contact recreational uses are impaired by chlorophyll *a* and E-coli bacteria and aquatic life uses are impaired by aluminum and pH. The Fact Sheet states, "*When a State has not established a numeric water quality criterion for a specific pollutant that is present in the effluent in a concentration that causes or has a reasonable to cause a violation of the narrative water quality standards, the permitting authority must establish effluent limits in one of three ways."* One is by calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use. The second determined on a case-by-case basis using SWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information. Third, is based on an indicator parameter.

The EPA has not demonstrated that TP is causing a WQ violation and has not factored in reductions in their "Reasonable Potential" argument.

Response C.7.

Contrary to the above comment, the Merrimack River is in fact exhibiting the effects of eutrophication. Elevated concentrations of chlorophyll *a* is one of the clearest indicators of cultural eutrophication. As discussed in the Fact Sheet, and elaborated upon throughout this Response to Comments document, chlorophyll *a* is identified as causing impairment of the primary contact recreation designated use in the segment of the Merrimack River into which the Nashua WWTF discharges (requiring the development of a TMDL, which is scheduled for completion in 2019) in the *State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (Assessment Unit ID: NHRIV700061206-24; see *State of New Hampshire Final 2010 Section 303(d) Surface Water Quality List* (NHDES 2010)). Additionally, the data presented in Figures 1 and 3 (see Response C.8.), from the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (December 2012), illustrate that both chlorophyll *a* and total phosphorus levels increase appreciably upstream to downstream, particularly in the vicinity of the Nashua WWTF, which suggests the receiving water is being negatively impacted by elevated nutrient levels, particularly in the lower reaches that were sampled. It is also worth noting that the flows recorded at the nearest USGS gaging station located upstream from the Nashua WWTF (USGS gaging station No. 01092000, Merrimack River near Goffs Falls, below Manchester) on the sampling dates for the data presented in the figures included in Response C.8. were an order of magnitude greater than the 7Q10 flow for that gage. Therefore, it is reasonable to expect that the observed effects would be greater under 7Q10 flow conditions.

In consideration of the numeric instream phosphorus target, the available effluent and receiving water data, the projected receiving water concentrations, and evidence of impairments in the receiving as evidenced by elevated instream quantities of chlorophyll *a* and total phosphorus, EPA has determined that the discharge of phosphorus from the Nashua WWTF has the reasonable potential to cause, or contribute to exceedances of New Hampshire's Water Quality Standards. As such, EPA is required to include a total phosphorus limit in the permit.[11]

[11] The Region takes into account site-specific circumstances particular to each discharge before imposing an effluent limitation. The commenter should note, however, that the Region's overall approach to calculating numeric

Comment C.8.

LOW DISSOLVED OXYGEN INDICATES NUTRIENT AND CHLORPHYLL-A PROBLEMS

The draft Nashua permit pg. 20 of 36 states at the start of paragraph 3, "**While phosphorus is a causal indicator of eutrophication, chlorophyll *a* and dissolved oxygen are response indicators** whose quantities may be correlated with…**elevated concentrations of chlorophyll *a*, excessive algal and macrophyte growth, and low levels of dissolved oxygen are all effects of nutrient enrichment."** As there were no oxygen violations, as noted in the below discovery, or instances of excessive algal and macrophyte growth, there is no evidence that phosphorus levels are causing degradation.

The most recent 'Upper Merrimack and Pemigewasset River Study Field Program' (MRP-Study) that was conducted between 2009 and 2012, as funded by the USACOE, contains numerous data. For brevity sake this document will be referred to as MPR-Study. The CALM states, "*Surface water quality assessments are intended to determine the current designated use support. Use of out-dated information can result in assessments that are not representative of actual conditions in the water body… Obviously the more current the data the more accurate the assessment…. The maximum data age requirement for lakes and ponds is 10 years versus five years for other water body types.*" (CALM – Section 3.1.11 Data Age).

One of the goals of the Section 305(b) of the CWA is to assess all surface waters. To assess a large population such as surface waters, there are two generally accepted data collection schemes. The first is a consensus which requires examination of every unit in the population. A more practical and economic approach is to conduct a sample survey which involves sampling a portion of the population through probability (or random) sampling…. Probabilistic assessments are most useful for 305(b) reporting purposes… which might otherwise be impossible to do using the census approach" (CALM – Section 3.1.27 Probabilistic Assessments).

The extensive MPR-Study is not only the most current data available, but in this rare instance includes an entire population of data for the largest river in the state, rare by any scientific standard as pointed out by both the EPA and NHDES. The CALM states, "*The number of samples needed to make a use support decision plays a large role in an assessments defensibility and believability…. The more data there is the more confident one can be that the data represents actual conditions. In statistical terms the entire collection of all measurements is called the population. Since it is impossible to sample the entire population, it is necessary to try to describe the population based on a subset of the measurement. By doing so, some error is always introduced*" (CALM Section 3.1.17). In this instance the entire population was not only sampled once, but twice during lower flow critical conditions.

One sampling event happened on July 27, 2010 when the flow was at 2.5 times the 7Q10. The measured upstream phosphorus was 36 µg/l. Upstream flow was 2.5 X the 7Q10 equaling 1,225

phosphorus limits to implement narrative water quality criteria has been upheld by the U.S. Environmental Appeals Board and the First Circuit Court of Appeals.

mgd that would give an upstream TP loading of 368 lbs. The other was on September 21, 2010 when the flow was at 1.5 times the 7Q10 at 67 µg/l giving an upstream TP concentration of 411 lbs. The newly calculated in stream median is 51.5 µg/l. This at the 7Q10 would give an instream load of 218 lbs at 7Q10 flows. This is 60% or less of the calculated "Reasonable Potential" loading when measured on these days with no adverse impact to the WQ of the Merrimack River. When you look at the reductions outlined above that are currently happening along the Merrimack River with Merrimack's nutrient treatment and the nutrient treatment proposed at the Manchester WWTP within two years, there will be no greater loading to the Merrimack River than what was measured during the summer 2010 sampling events. There is no potential for Nashua to grow to 16 mgd daily and no potential for the river concentration below Nashua to reach 130 µg/l for TP as Merrimack has significantly reduced its TP discharge and Manchester will be doing this as well in two years. The 0.6 mg/l limit is unnecessary when viewing the above actual conditions and result in an expensive unnecessary unfunded upgrade for Nashua.

Appendix C of the MPR-Study has 140 pages of data tables. Within these data tables is the most extensive sampling that has ever occurred on the entire Merrimack River within the boundaries of New Hampshire. Contained within these pages are 945 actual field sample events for dissolved oxygen (DO). In review of all the 945 DO data sets the lowest observed DO reading during the two critical events occurred at station M042 on July 27th. The DO was 5.5 mg/l with a saturation of 69%. A follow up DO was taken with a subsequent DO reading of 6.4 mg/l and a saturation of 77.8% (Attachment 1). It appears for whatever reason, the initial reading was compromised and should not be considered as the DO increased by 0.9 mg/l and the saturation by 8.8%.

Two other DO samples within the myriad of the critical low flow sampling period should be considered suspect. One of the DO samples was taken at station M049 during the September 21st critical low flow event at 3:30 PM (DO 5.7 mg/l with a saturation of 65.5%) with a follow up sample at 3:45 PM (DO 5.7 with a saturation of 65.3%). On first look these two samples are almost identical and one would think the samples are statistically correct. However, the Winkler DO test for 3:30 PM reads 8.0 mg/l which is 2.3 mg/l higher than the meter reading [Attachment 2 and 2(b)]. This adds doubt to the DO readings.

The other DO sample was done on September 21st. M047 had a DO of 6.1 mg/l and 72.4% saturation at 2:35 PM and retest DO of 6.8 mg/l with a saturation of 71.5% at 2:50 PM. The M047 test is questionable due to the fact the Winkler DO test for 2:35 PM had a reading of 7.9 mg/l for DO (Attachment 3).

There were no field samples of the 945 below the 5.0 mg/l limit for Class B waters. Two sampling stations on the Merrimack River had saturation limits below the 75% designation. These were Station M006 with a DO of 6.1 mg/l and a saturation of 71.6% on July 27th. Station M025 had a DO of 5.9 and saturation of 72.2% on July 27th (significantly upstream from the Nashua outfall).

Should oxygen saturation be assessed separately from the DO mg/l levels only two samples fall within the criteria as cited in the population samples. The CALM has a 10% rule for

impairment, "*For water quality assessments, there are basically two types of error Type I, the water body is assessed as impaired when it is really fully supporting and Type II, the water body is assessed as fully supporting when it is really impaired….DES employed the "binomial approach; in previous reporting cycles. The binomial approach, however, was criticized by some as being too lenient because the number of exceedances needed for a water body to be considered impaired increased with the total sample size, and at least 3 exceedances were needed for total sample sizes of 10 or less. The concern was that some water bodies were not being listed which were actually impaired. In response to these concerns DES decided to abandon the binomial approach starting with the 2006 cycle and adopt the slightly more stringent ten percent rule (i.e. 10% rule for determining use support"* (CALM-Section 3.1.17 Minimum Number of Samples – 10 Percent Rule). No field samples demonstrated a DO of less than 5 mg/l and only a couple of saturation levels fell below the 75%. Note: In 2006 NHDES dropped the assessment methodology from the binominal approach 30% to determine impairment to the 10% rule. This is a 66% reduction that is significantly more restrictive than the binominal approach.

The CALM states, "Any data submitted to the NHDES is first reviewed against the existing protocols in the CALM document. In the event the CALM does not include protocols to adequately assess a particular data set, DES staff review the data in the context of the NH water quality standards and prepare a written summary that includes a review of data, the applicable water quality standards, and a recommendation of attainment status. Nothing in the CALM shall be construed as a basis for not evaluating a submitted dataset" (CALM – Section 1.2.1 Assessment and Listing Methodology).

As referenced within the CALM and verified via sound-science through the MRP-Study, there is no DO impairment on in the Merrimack River. The NHDES is taking the unscientific approach by station that "Reasonable Potential" in the Nashua Draft Permit for TP discharge will cause future violations of the dissolved oxygen standard and excessive algal/macrophyte growth. Based on the two critical low-flow period sampling events, that comprise the most current data, it was demonstrated that there is no dissolved oxygen impairment within the Merrimack River and no excessive algal/macrophyte growth. This reasoning assures a Type I error for dissolved oxygen and phosphorus as outlined in the CALM.

Response C.8.

See Responses C.4 and C.5. regarding anticipated (but not yet existing) upstream reductions

EPA has addressed the specific comments in detail below, but as a preliminary matter, the Region observes that most if not all of the legal/regulatory objections to the permit underlying Manchester's comments on DO and other issues have been squarely addressed in past decisions by the United States Environmental Appeals Board and by the United States Court of Appeals for the First Circuit. *See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2282 (2013) (upholding the Region's overall methodology for imposing a phosphorus limit, including use of the Gold Book, among other information, to establish a site-specific total phosphorus limit applicable to that particular discharge); *In re Upper Blackstone Water Pollution Abatement Dist.*, NPDES Appeal Nos. 08-11

to 08-18 & 09-06 (EAB May 28, 2010) (same); *see also, In re City of Attleboro*, NPDES Appeal No. 8-08 (EAB Sept. 15, 2009) (same). Most recently, the EAB comprehensively addressed the Region's approach to interpreting the State's narrative nutrient criterion to derive an effluent limitation in *In re Town of Newmarket Treatment Plant*, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013). EPA encourages the Town to consult the specific portions of these decisions noted below in conjunction with reviewing the Region's responses below. They are available at:

Upper Blackstone First Circuit Decision Affirming Imposition of Phosphorus and Nitrogen Limits

http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/2D0D249E441A18F185257B6600725F04/$File/1st%20cir..pdf

Page	Issue
30, 33-34	Finding that the CWA and EPA regulations allow EPA to proceed with permit reissuance even where there is uncertainty in the existing data without waiting until better science can be developed or more data gathered
31	Discussing risk associated with waiting to address to nutrient-based cultural eutrophication
32	Addressing claim that EPA should have "relied on more recent data" where EPA has no reason to question the continuing validity of data on which it relied
36	Discussing MERL model's use of correlations between data sets, rather than cause-and-effect models, in development of nutrient permit limit
50-53	Upholding EPA's use of national and regional guidance criteria, including the Gold Book value of 0.1 mg/l, in conjunction with site-specific data in determining phosphorus limit

Upper Blackstone EAB Decision Affirming Imposition of Phosphorus and Nitrogen Limits

http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/NPDES%20Permit%20Appeals%20(CWA)/34E841C87F346D94852577360068976F/$File/Denying%20Review....pdf

Page	Issue
31-32	Finding that affirmative reasonable potential determination requires neither demonstration of causation nor certainty ("greater than a mere possibility)
80-83	Finding EPA's approach of establishing a range of target ambient values for phosphorus from EPA nationally recommended criteria guidance to be a regulatorily-authorized method for determining a phosphorus limit
83	Rejecting request for delay in imposition of phosphorus limit pending additional data or causal demonstrations in light of, *inter alia*, Region's conservative approach to nutrient permitting and overall objectives of the CWA

Attleboro EAB Decision Affirming Imposition of Phosphorus and Nitrogen Limits

http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/NPDES%20Permit%20Appeals%20(CWA)/D506EBEE22A1035E8525763300499A78/$File/Denying%20NPDES%2008...84.pdf

Page	Issue
63	Upholding EPA's use of recommended Gold Book values and low flow conditions in determining phosphorus limit
65	Finding that EPA need not demonstrate actual impacts to the receiving water prior to imposing a permit effluent limit
72-73	Finding that EPA may reasonably consider current background conditions despite any expected future reductions

Newmarket EAB Decision Affirming Implementation of the Narrative Nutrient Criterion

http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Recent~Additions/97CCD304C9B7E58585257C3500799108/$File/Order%20Denying%20Review.pdf

Page	Issue
49-51	Rejecting request for delay in imposition of nutrient limit pending additional data or causal demonstrations in light of, *inter alia*, Region's conservative approach to nutrient permitting and overall objectives of the CWA
54 n 23	Finding that "reasonable potential" determination does not require a conclusive demonstration of cause and effect

Overall, Manchester's comments reflect a flawed understanding of the legal framework for NPDES permitting, including the regulatory standard for imposing necessary effluent limitations in a permit. As established by the decisions cited above, and as evidenced by the plain language of the statute and regulations, a waterbody need not be listed as impaired for a pollutant in order for the Region to impose an effluent limitation for that pollutant in an NPDES permit. Sections 301 and 402 of the Act, and implementing regulations at 40 C.F.R. § 122.44(d), are the provisions that govern this permitting action, not Section 303(d) and associated non-binding listing guidance such as CALM.

Under CWA section 402, 33 U.S.C. § 1342, EPA may issue NPDES permits "for the discharge of any pollutant, or combination of pollutants" if the permit conditions assure that the discharge complies with certain requirements, including those of section 301 of the CWA, 33 U.S.C. § 1311. Section 301(b)(1)(C), 33 U.S.C. § 1311(b)(1)(C), of the Act requires that NPDES permits include effluent limits more stringent than technology-based limits whenever:

> necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations…or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to [the CWA].

NPDES permits must contain effluent limitations necessary to attain and maintain WQS, without consideration of the cost, availability or effectiveness of treatment technologies. *See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2282 (2013).

EPA has implemented its Sections 301(b)(1)(C) and 402 of the Act through numerous regulations, which specify when the Region must include permit conditions, water quality-based effluent limitations or other requirements in NPDES permits. Most trenchantly, 40 C.F.R. § 122.4(d) *prohibits* issuance of an NPDES permit "[w]hen the imposition of conditions cannot *ensure* [emphasis added] compliance with the applicable water quality requirements of all affected States." Section 122.44(d)(1) is similarly broad in scope and obligates the Region to include in NPDES permits "any requirements…necessary to: (1) Achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

EPA's regulations set out the process for the Region to determine whether permit limits are "necessary" to achieve WQS and for the formulation of these requirements. *See* 40 C.F.R. § 122.44(d). Permit writers are first required to determine whether pollutants "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion" of the narrative or numeric criteria set forth in the WQS. *Id.* § 122.44(d)(1)(i). EPA guidance directs that this "reasonable potential" analysis be based on "worst-case" conditions. *In re Washington Aqueduct Water Supply Sys*., 11 E.A.D. 565, 584 (EAB 2004). If a discharge is found to cause, have the reasonable potential to cause, or contribute to an excursion of a state water quality criterion, then a permit *must* contain effluent limits as stringent as necessary to achieve the WQS. 40 C.F.R. § 122.44(d)(1), (5).

Even assuming that there is no evidence of exceedances of water quality standards for DO —a conclusion with which the Region disagrees, as described below—it is well established under Board precedent and guidance that EPA does *not* need to wait for the water quality violations to occur prior to imposing a protective effluent limitation in an NPDES permit. The requirement to impose a permit limit is not only premised on a finding that the pollutant discharges "are" at a level that "causes" violation of the applicable water quality standards, but the requirement is also triggered by a finding that the facility's pollutant discharges "may" be at a level that "contributes" to or has the "reasonable potential" to cause a violation. 40 C.F.R. § 122.44(d)(1)(i). The regulation requires water quality-based effluent limits even when there is some degree of uncertainty regarding both the precise pollutant discharge levels and the potential causal effects of those discharges, so long as the record is sufficient to establish that there is a "reasonable potential" for that discharge to cause or contribute to a violation of water quality standards. EPA in the Final Rule Preamble for 40 C.F.R. § 122.44(d)(1) dispels any doubt over the necessity of proving an impairment and causation of that impairment prior to either deriving a numeric instream target to implement a narrative water quality criterion, or imposing a water quality-based effluent limitation to implement that criterion:

> "Several commenters asked if it was necessary to show in-stream impact, or to show adverse effects on human health before invoking [§ 122.44(d)(1)(vi)] as a basis for establishing water quality-based limits on a pollutant of concern. It is not necessary to show adverse effects on

> aquatic life or human health to invoke this paragraph []. The CWA does not require such a demonstration and it is EPA's position that it is not necessary to demonstrate such effects before establishing limits on a pollutant of concern." 54 Fed. Reg. 23,868, 23,878 (June 2, 1989).

"Reasonable potential" requires some degree of certainty greater than a mere possibility, but it leaves to the permit writer's scientific and technical judgment how much certainty is necessary. The regulations, thus, require a precautionary approach when determining whether the permit must contain a water quality-based effluent limit for a particular pollutant.

The contention that the Region should be limited to the CALM and the MRP-Study in making its reasonable potential determinations is unfounded, as is the vague allegation that the data and approaches the Region did consider are somehow scientifically or technically unsound. In determining whether a discharge has the reasonable potential to cause or contribute to a WQS violation, "the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent . . . and where appropriate, the dilution of the effluent in the receiving water." 40 C.F.R. § 122.44; *see also* 54 Fed. Reg. 23,868, 23,873 (June 2, 1989) ("[A] permitting authority has a significant amount of flexibility in determining whether a particular discharge has a reasonable potential to cause an excursion above a water quality criterion, taking the factors in subparagraph (ii) into account"). It is the Region's position that, in making reasonable potential determinations, no one source of information should necessarily be given definitive weight, nor should the absence of any particular information source necessarily preclude EPA from establishing an effluent limit. The approach of utilizing available technical materials generated by EPA and States, as supplemented by other information reasonably available at the time of permit reissuance, is also reasonable in light of federal regulations requiring EPA to include requirements that will achieve state water quality standards when reissuing a permit and prohibiting issuance of a permit when the imposition of conditions cannot ensure compliance with the applicable state water quality requirements of all affected States. *See* 40 C.F.R. §§ 122.4(d), 122.44(d)(1); *see also* CWA §§ 301(b)(1)(C) and 401(a)(2).

Responses to Specific Comments

As discussed above, whether or not a receiving water segment is listed on the State's 305(b) and 303(d) lists does not determine whether a limit should be included in an NPDES permit. The absence of such a listing is irrelevant from a regulatory standpoint in instances where the Region otherwise concludes that the discharge has the reasonable potential to cause or contribute to a water quality standards violation. While NPDES determinations may be informed by State water quality assessments and listings, such listings are not prerequisites for determining that NPDES permit limits are necessary. EPA's regulations do not require that determinations on water quality-based effluent limits necessarily be consistent with existing state 303(d) listing designations. Impairment designations are not made according to the same standard that governs NPDES permitting decisions; permitting regulations require the imposition of effluent limits whenever a pollutant discharge "causes, has the reasonable potential to cause, or contributes to" a water quality violation. In determining the existence of reasonable potential, the Region considered the Section 303(d) listing to be one relevant factor pointing toward imposition of a

limit but conducted additional analysis before concluding that a limit was necessary. EPA has used the available data and in the Fact Sheet articulated a rational approach allowable under the regulations to determine that the facility has the reasonable potential to cause or contribute to a water quality violation. This approach is not the same as that used in 303(d) listing procedures, nor is it required to be.[12] EPA's reasonable potential determination for phosphorus is provided on pages 19 – 24 of the Fact Sheet, with further analysis provided below.

The State of New Hampshire's 2010 *Final List of Threatened or Impaired Waters That Require a TMDL* designates the Merrimack River segment receiving the discharge from the Nashua WWTF (NHRIV700061206-24) as impaired for chlorophyll *a*. Such designation is cause for concern, and was taken into consideration during the development of the Draft Permit, as an impairment due to chlorophyll *a* is indicative of nutrient enrichment in the vicinity of the discharge

The Region has reviewed the MPR-Study cited by Manchester. Contrary to the commenter's view, the Region concludes that the MPR-Study does not undermine the Region's permitting decision in this case.

The Upper Merrimack and Pemigewasset River Study referenced in this comment includes the results of chlorophyll *a* and total phosphorus analyses that were conducted on samples collected upstream of the Nashua WWTF on July 27, 2010 and September 21, 2010. These results are depicted below in the Figures 1 and 2, and indicate an increase in instream chlorophyll *a* and total phosphorus concentrations in the vicinity of the Nashua WWTF. The conditions present in the receiving water on the sampling dates were observed when flows in the river were approximately 2.5 and 1.5 times (respectively) the 7Q10 flow, as measured at the nearest USGS gaging station located upstream from the Nashua WWTF (USGS gaging station No. 01092000, Merrimack River near Goffs Falls, below Manchester). One can reasonably expect that the observed conditions would be greater under 7Q10 flow conditions.

The MPR-study also includes the results of two types of DO analyses: field tests and Winkler tests. Put simply, field tests are instantaneous DO measurements taken in the field using portable DO meters, and Winkler tests are samples that were preserved and later analyzed in the lab. These samples were collected as single grab samples at each sampling location. This is not the preferred data/condition for assessing DO conditions described in the CALM. The CALM's preferred method is that such determinations be based on a series of measurements taken at the same location one hour apart over a 24 hour period. When preferred data is not available, assessments may be done for individual grab samples according to criteria found in Part 3.2.4, Indicator 1, Notes 5.c.2.a and 5.c.2.b. For DO concentration in a Class B water, any sample collected between 05:00 and 08:00 with less than 4.5 mg/l DO is an exceedance. For percent saturation, any sample collected between 05:00 and 10:00 with DO saturation less than 45

[12] While 40 CFR § 122.44 does require consistency with some state determinations, for example requiring that effluent limit be "consistent with the requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA," §122.44(d)(1)(vii)(B), there is no such mention of State listing decisions pursuant to CWA sections 305 and 303(d). Indeed, the State listing materials are not even mentioned in the list of "relevant information" set forth in 122.44(d)(1)(vi)(A), nor in the reasonable potential provision of the regulation.

percent or any sample collected between 14:00 and 19:00 with DO saturation less than 70 percent is an exceedance.

EPA acknowledges that the DO field tests on July 27 and September 21, 2010, the two sampling days with receiving water flow closest to 7Q10 flow, did not show any violations of the 5.0 mg/l criterion. However, almost all of the Winkler tests taken on September 21, 2010 both upstream and downstream of the Nashua WWTF discharge were significantly below this criterion (approximately 32 out of 33 Winkler tests that day were under 5 mg/l along the Merrimack River). Of the 33 Winkler tests that day, seven were taken between 05:00 and 08:00. Six out of those seven tests were below 4.5 mg/l, violating the CALM's criterion. The State's minimum DO criterion is applicable under all receiving water flow conditions.

In addition, the commenter referenced five field tests on these two days (July 27 and September 21, 2010) that were less than 75% DO saturation (one at M042, two at M049 and two at M047), but considers them questionable due to a higher DO value in either a retest or a corresponding Winkler test. In the first example, a DO saturation of 69.0% was measured at station M042 on July 27, 2010, but a second measurement (77.8%) at the same location and time was above the criterion. These samples were taken at 6:25 PM indicating that the 69% measurement is a violation per the CALM (i.e., less than 70% between 14:00 and 19:00) while the 77.8% measurement was not.

In the second example, at station M049 on September 21, 2010, two DO % saturation measurements (65.5% and 65.3%) were taken. These samples were taken at 3:30 AM and 3:45 AM, respectively, so would not be exceedances per the CALM. The commenter suggests that these are questionable because both of these were at 5.7 mg/l DO and a corresponding Winkler test was 8.0 mg/l. In the final example, at station M047 on September 21, 2010 two DO % saturation measurements (72.4% and 71.5%) were taken. These samples were taken at 2:35 AM and 2:50 AM, respectively, so would not be exceedances per the CALM. The commenter suggests that these are questionable because these measurements were at DO concentrations of 6.1 and 6.8 mg/l respectively and a corresponding Winkler test was 7.9 mg/l. Although EPA does acknowledge some discrepancies seem to exist between corresponding percent saturation and concentration measurements in the data, one (69% at station M042) of the five field tests referenced by the commenter is determined to be a violation per the CALM.

In summary, a review of all the relevant data shows that there are some discrepancies between the field tests and the Winkler tests. In some cases, the Winkler tests resulted in violations of the DO concentration criterion (5 mg/l) while corresponding field tests did not. In other cases, the field tests showed DO percent saturation violations, while corresponding Winkler tests do not indicate a violation. As mentioned, EPA agrees that there is some discrepancy between the field tests and Winkler tests at various sampling locations, but does not have sufficient QA/QC information to determine which data points most closely characterize the actual DO concentrations. EPA believes that the data does raise a significant level of concern regarding instream DO in the Merrimack River. As noted previously, these data were not determinative in EPA's reasonable potential calculations or in the decision to include a limit on total phosphorus in the permit.

EPA also notes that in many cases low DO may not be the best indicator of eutrophication. Depending on the time of day and water depth during sampling, a better indicator may be DO supersaturation and increased levels of chlorophyll *a*. Based upon the diurnal cycle of algae, these indicators represent evidence of algal growth (typically occurring during the day near the water surface), whereas low DO saturation represents evidence of algal die-off (typically occurring during the night near the river bottom). In this case, although there were only a few measurements below the 75% DO saturation criterion, a review of the data report from the July 2010 sampling event does indicate significant DO supersaturation (>100%) as well as increased levels of chlorophyll *a* (>15 µg/l) in the vicinity of the Nashua WWTF. Figures 1 and 2[13], shown below 3[13], illustrate the levels of chlorophyll *a* and DO saturation, respectively, along the Merrimack River on July 27. 2010. Both DO saturation and chlorophyll *a* levels increase appreciably as the Merrimack River flows from upstream to downstream, particularly in the vicinity of the Nashua WWTF. This data correlates with instream phosphorus concentrations detected in samples of the receiving water, as shown below in Figure 3[13], that were collected both upstream and downstream from the Nashua WWTF, which suggests eutrophic effects are present and the current discharge of phosphorus from the Nashua WWTF has the reasonable potential to cause or contribute to these effects. Hence, the permit contains a total phosphorus limit.

[13] From *the Upper Merrimack and Pemigewasset River Study Monitoring Data Report (*USACE December 2012))

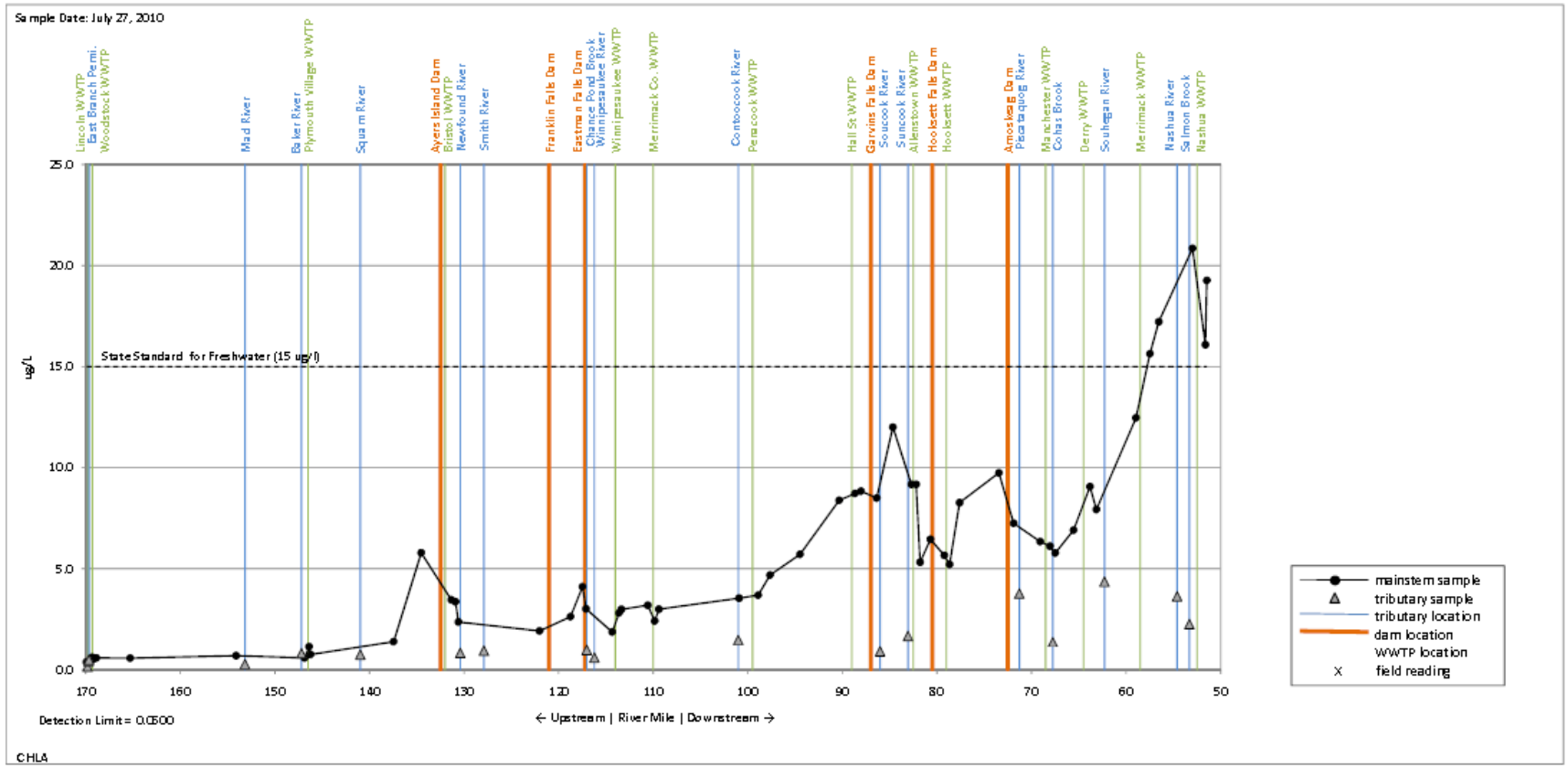

Figure 1 Instream Chlorophyll *a* Concentrations – July 27, 2010 (from the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (USACE December 2012))

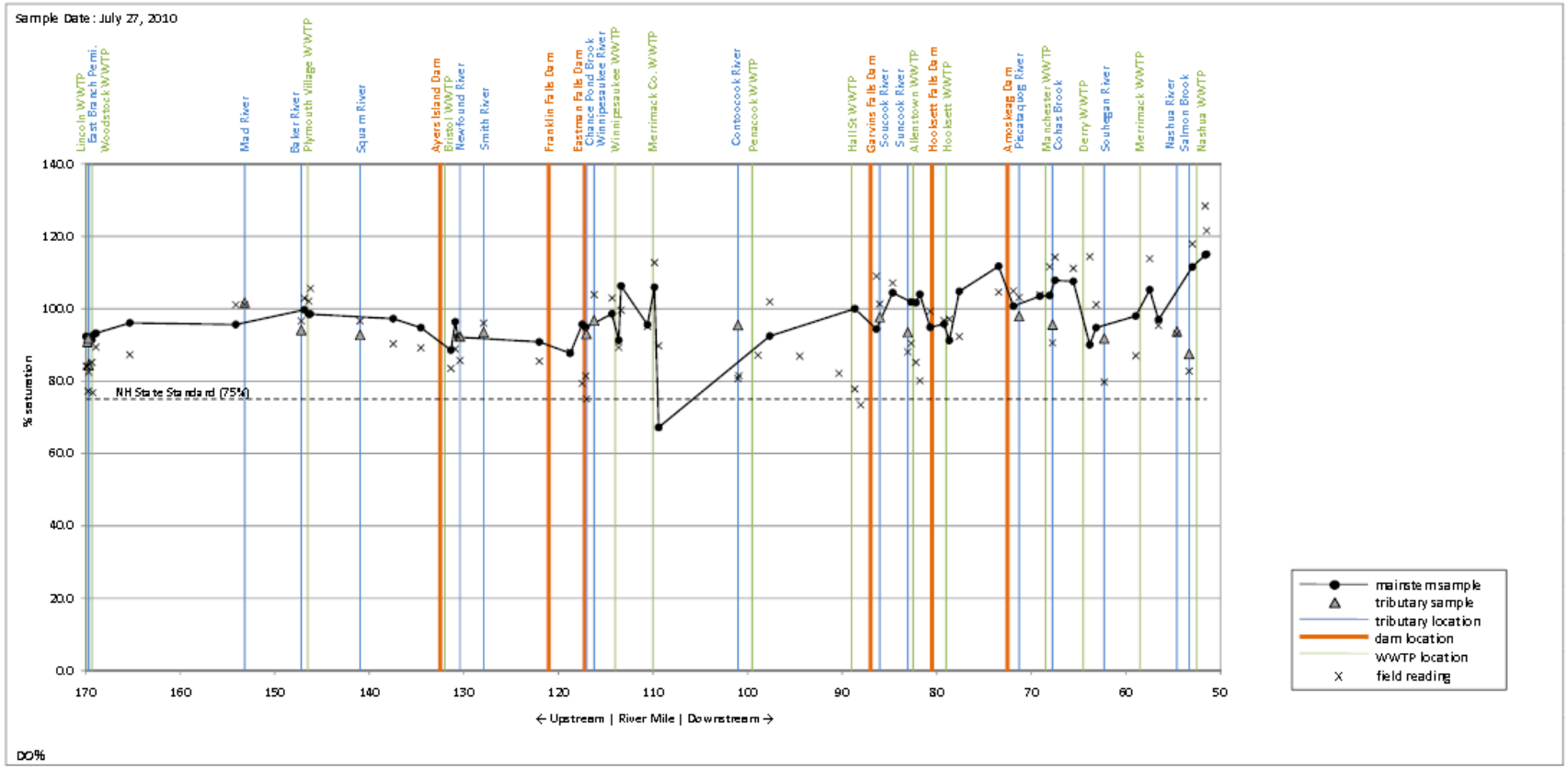

Figure 2 Dissolved Oxygen Percent Saturation- July 27, 2010 (from the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (USACE December 2012))

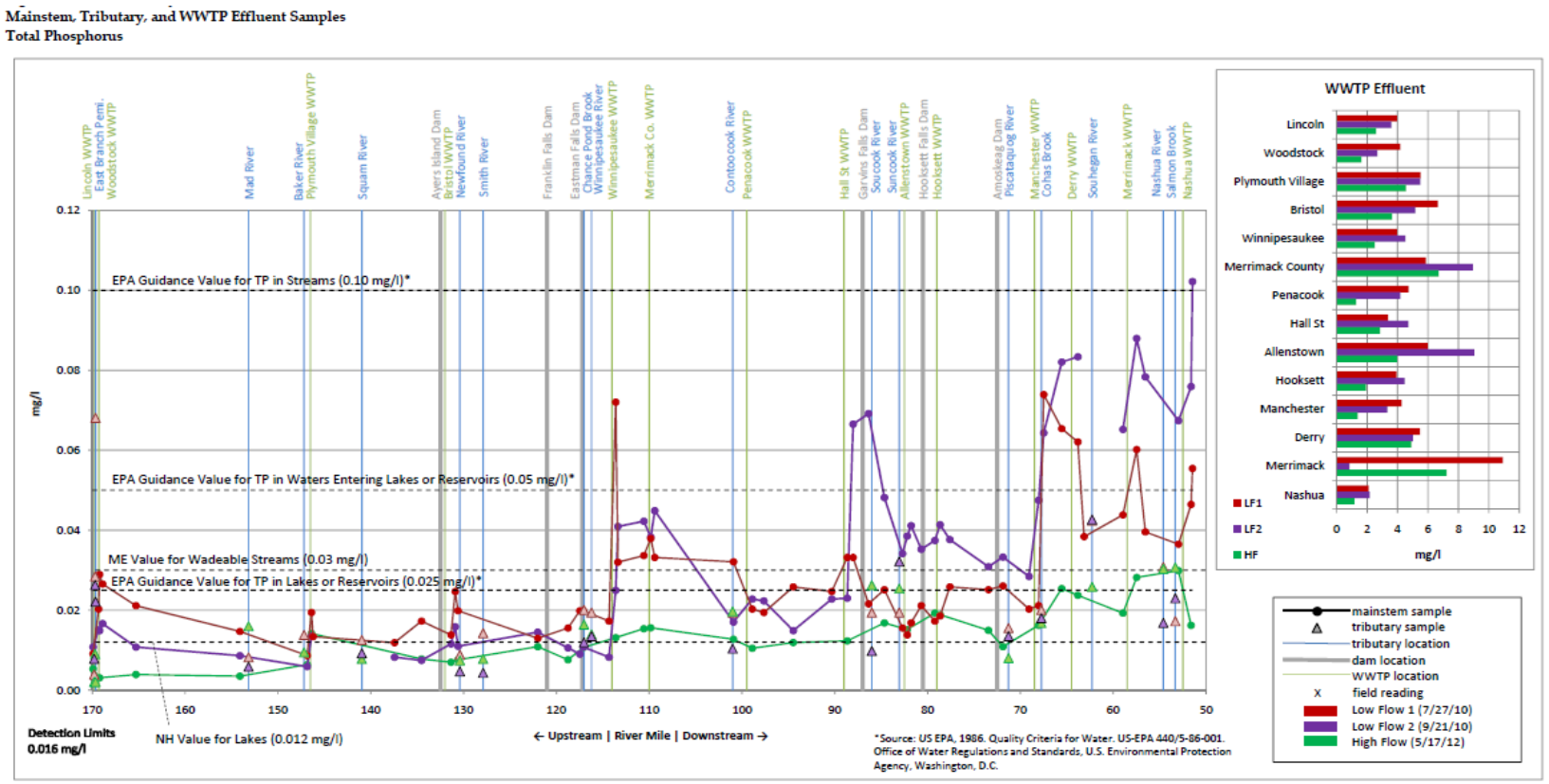

Figure 3 Instream Total Phosphorus (from the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (USACE December 2012))

Comment C.9.

COPPER

Attachment H of Nashua's Draft Permit has a determination for reasonable potential for Copper. The Merrimack River is only listed as impaired for the metal Aluminum as outlined in paragraph 3 on page 11 of 36. There is no 303(d) impairment for copper. Attachment D (pg. xv) of the Draft Permit lists WET testing upstream from Nashua's outfall. The maximum concentration is 11 µg/l, the average is 2 µg/l and the median is 2 µg/l. None of these samples were taken via clean sampling techniques. Table 3-32 of the NHDES CALM lists WQ criteria for non-clean sampling as 15.7 µg/l for freshwater chronic. As the average/median upstream concentration is 2µg/l as sampled by non-clean methods, there is no WQ impairment evidenced in the Merrimack River for Copper when sampled using non-clean sampling techniques.

When you take the non-clean sampling concentration for copper (15.6 µg/l), as outlined in Table 3-32 of the CALM and multiply that by the dilution factor of 28.5 you get a copper discharge concentration of 447 µg/l for typical non-clean sampling conditions and not the 20 µg/l that is listed in the Draft Permit.

Also note in Attachment H at the bottom of page xxii, that the Draft Permit makes reference to the chronic aluminum criterion (87 µg/l) and does not correctly reference the Copper criterion as outlined in the NHDES CALM.

Response C.9.

EPA assumes that the commenter intended to reference Attachments D and H to the Fact Sheet which accompanied the Draft Permit. EPA also notes that Attachment H to the Fact Sheet, which provides an example reasonable potential analysis, included an incorrect reference to the chronic aluminum criterion. The correct reference is to the chronic copper criterion of 2.85 µg/l.

Sections 301 and 402 of the Act, and implementing regulations at 40 C.F.R. § 122.44(d), are the provisions that govern this permitting action, not Section 303(d) and associated non-binding listing guidance such as the CALM. Therefore, the CALM methodology (the methodology by which the state determines whether to list a receiving water as impaired) is not determinative. EPA's decision to include a water quality-based effluent limitation in the permit for a particular pollutant is not dependent on the receiving water being listed as impaired for that pollutant

Upon establishing that there was a reasonable potential for the discharge of copper from the Nashua WWTF to cause or contribute to excursions above the applicable water quality criteria, EPA was compelled to include a copper effluent limit sufficiently stringent to ensure compliance with standards. *See* 40 C.F.R. § 122.44(d)(1). This limit must be imposed whether or not the Merrimack River is designated as impaired for copper on the 303(d) list.

Inclusion of the metals data that were presented in the Fact Sheet is appropriate, as they represent samples that were collected in accordance with the *Freshwater Acute Whole Effluent Toxicity Test Procedure and Protocol* (February 28, 2011). Although permittees are welcome to submit data collected using methods whose level of sophistication exceeds that required by the

Freshwater Acute Whole Effluent Toxicity Test Procedure and Protocol (February 28, 2011), they are not required to do so, and EPA is not required to refrain from calculating NPDES permit limits and to indefinitely forestall their implementation in the absence of such data.

Comment C.10.

LEAD

Attachment H of Nashua's Draft Permit has a determination for reasonable potential for Lead. The Merrimack River is only listed as impaired for the metal Aluminum as outlined in paragraph 3 on page 11 of 36. There is no 303(d) impairment for Lead. Table 2 on pg 18 of 35 indicates a median upstream concentration of 0.5 µg/l. Footnote 5 states (Establishing a limit equal to the criterion would be appropriate because the median upstream concentration exceeds 90% of this value (.54 X .9 + 0.486 µg/l) of the Draft Permit lists WET testing upstream from Nashua's outfall. Table 3-32 of the NHDES CALM lists WQ criteria for non-clean sampling as 4.8 µg/l for freshwater chronic. As the upstream median is 0.5 µg/l (12.5% of allowed in-stream lead for non-sampling techniques) there is no WQ impairment for Lead as measured upstream and it is unfounded to set a lead limit in the Nashua permit as stated in footnote 5.

When you take the non-clean sampling concentration for lead (4.8 µg/l), as outlined in Table 3-32 of the CALM and multiply that by the dilution factor of 28.5 you get a lead discharge concentration of 137 µg/l and not the 0.54 µg/l that is listed in the Draft Permit. It may be appropriate for the EPA to nudge permittees toward the practice of clean sampling techniques as the EPA has moved permitted toward electronic DMR reporting, otherwise Table 3-32 of the CALM should be the guidance for metals concentrations when developing metals limitations.

Also note that when the DMRs are submitted the EPA does not allow a < or ND factor in the sheet. It has been requested that the detection limit be submitted to allow the program to accept the data. There is no indication in the Draft Permit if some of the data supplied was less than the detection limit or of the ND designation where a detection limit was used. The need to have a number in all spaces on the DMR skews the average and median concentrations toward higher calculations.

Response C.10.

Attachment H of the Fact Sheet includes an example reasonable potential determination for copper, not lead, as stated in the comment.

EPA has several issues with this comment. The commenter applies the metals criterion contained in NHDES's CALM, which are applied when the data is from samples that were collected using non-clean sampling techniques. These criteria, however, have not been approved by EPA nor have they been adopted into the State WQS.

The commenter also arrives at a proposed limit of 137 µg/l by multiplying the dilution factor by the criteria value found in the CALM. The commenter does not account for the 90% reserve capacity of the receiving water, as required by the NH WQS, nor does it account for background concentrations.

NHDES applies the values found in Table 3-32 of the CALM when making determinations as to whether the aquatic life designated use is supported in a fresh water body under CWA Section 303(d) (see *2012 NHDES Consolidated Assessment and Listing Methodology (CALM)* (NHDES 2012)). Sections 301 and 402 of the Act, and implementing regulations at 40 C.F.R. § 122.44(d), are the provisions that govern this permitting action, not Section 303(d) and associated non-binding listing guidance such as the CALM. Therefore, the values used in making use support determinations is not directly applicable to this permitting action and was not determinative in EPA's permitting decision.

EPA's decision to include a water quality-based effluent limitation in the permit for a particular pollutant is not dependent on the receiving water being listed as impaired for that pollutant. Upon establishing that there was a reasonable potential for the discharge of lead from the Nashua WWTF to cause or contribute to excursions above the applicable water quality criteria, EPA was compelled to include an effluent limit for lead that is sufficiently stringent to ensure compliance with standards. *See* 40 C.F.R. § 122.44(d)(1). This limit must be imposed whether or not the Merrimack River is designated as impaired for lead on the 303(d) list.

EPA acknowledges that there is currently no code available for signifying a test result that is less than the detection limit. However, the results of metals analyses conducted on samples of the effluent and receiving water in conjunction with WET tests, as well as the detection limits for these analyses, are provided in the WET test reports that are submitted to EPA and NHDES. Attachment D of the Fact Sheet, which includes effluent and receiving water metals data, clearly indicates those results which were reported as "non-detect," and also notes that these results were assigned a value equal to 0.

Comment C.11.

UNFUNDED MANDATE

Article 28-a of the State's Constitution, Bill of Rights, adopted on November 28, 1984 states, "The state shall not mandate or assign any new expanded or modified programs or responsibilities to any political subdivision in such a way as to necessitate additional local expenditures by the political subdivision unless such programs or responsibilities are fully funded by the state or unless such programs or responsibilities are approved for funding by a vote of the local legislative body of the political subdivision."

Section 541-A:25 Unfunded State Mandates II of the Administrative Procedures Act State, "Such programs also include, but are not limited to, functions such as police, fire and rescue, roads and bridges, solid waste, sewer and water, and construction and maintenance of buildings and other municipal facilities or other facilities or functions undertaken by a political subdivision."

The NHDES is establishing new limits for phosphorus, copper and lead at the Nashua WWTP and within the Merrimack River where clearly, the "sound science" data of the MPR-Study indicates there is no impairment in the Merrimack River. Without the establishment of TMDLs the appearance of regulatory overreach is prominent when viewing the different TP loads for Concord, Merrimack and Nashua. The "Reasonable Potential" loadings as expressed in the

permit narrative were at times exceeded during the extensive consensus/population MPR-Study with no impairment results. This contradicts the NHDES' "Reasonable Potential" argument as evident through the massive amount of data collected in the Phase II MPR-Study. The MPR-Study demonstrates that a phosphorus limit is not needed for the Merrimack WWTP and that the Merrimack River is in compliance with WQ standards.

The Army Corps of Engineers along with the NHDES and several municipal stakeholders has begun Phase III of the MRP-Study that will specifically measure metals by clean-sampling techniques. The data gathered from this third round of extensive sampling will determine whether or not there is metals contamination in the Merrimack River from Manchester through Amesbury Massachusetts. It is premature at this time to insist there is contamination within the Merrimack by viewing data that was not sampled via clean-sampling techniques. The sampled data is below the limits criteria for non-clean sampling concentration as outlined in the CALM, Table 3-32 and insistence in placing these concentrations in Nashua's permit is an unfunded mandate.

The NHDES "Reasonable Potential" argument is mandating Nashua to upgrade their facility to meet phosphorus removal capabilities far below those mass limits given to upstream WWTPs that will cost the City millions of dollars for design, construction, equipment and ongoing operations and maintenance costs. It is clear that the average monthly concentration limit of 0.6 mg/l limit included in the Draft Permit based on "reasonable potential", but clearly contradicted by the scientific findings of the MPR-Study, is an unfunded mandate that will cost the rate payers of Nashua unneeded expenses to achieve a reduction of a pollutant that does not currently, nor will it during the next permit cycle, cause a water quality violation.

The NHDES must revisit the mass loading allocations give to Concord and proposed for Merrimack and assure that Nashua and other future permittees like Manchester, Derry and Hudson are all receiving equal riparian rights and would be assured with an established TMDL.

Response C.11.

It is assumed that the reference in the third paragraph to the Merrimack WWTP was intended to be for the Nashua WWTF.

By its terms, Section 541-A:25 Unfunded State Mandates II applies to the State, not EPA in issuing a federal NPDES permit. To the extent that the reference to "unfunded mandates" also refers to the requirements of the Unfunded Mandate Reform Act of 1995 (UMRA), the UMRA is inapplicable to this permitting action. The UMRA applies to rulemaking, and not individual NPDES permit decisions. For example, in *In re City of Blackfoot Wastewater Treatment Facility*, NPDES Appeal No. 00-32 (EAB September 17, 2001), the Environmental Appeals Board denied a petition for review of compliance with UMRA on grounds that UMRA applies only to regulations, not to individual NPDES permits, which are more akin to licenses than a regulation.

The State generally adopts federal NPDES permits as State permits so that facilities can lawfully discharge wastewater under State law, specifically RSA 485-A:13, I(a). However, no issue

under Part I, Article 28-a of the N.H. Constitution arises when that happens. Any costs incurred to comply with the federal NPDES permit are attributable to the federal action in issuing the permit. The costs to Nashua to comply with the permit will not increase as a result of the State's adoption of the federal NPDES permit as a state permit. There thus are no "additional local expenditures" that can be attributed to the State's actions. RSA 541-A:25, which is the General Court's interpretation of Part I, Article 28-a, likewise does not apply to this case. RSA 541-A:25, I, to which the language quoted by Manchester refers, establishes that the section applies to a "state agency to which rulemaking authority has been granted". The Department is not aware of any case in which RSA 541-A:25 has been applied outside of a rulemaking proceeding.

EPA assists in financing the cost of treatment needed to achieve compliance with the Clean Water Act through the Clean Water Act State Revolving Fund (SRF). Through the SRF program, New Hampshire maintains revolving loan funds to provide low cost financing for a wide range of water quality infrastructure projects. Funds to establish or capitalize the SRF program are provided through federal government grants and state matching funds (equal to 20% of federal government grants). EPA has provided New Hampshire with a total of $358,419,565 in Clean Water Act SRF grant funds for the period from 1989 through 2012.

Regarding the "sound-science" data of the MPR-Study, the commenter does not accurately characterize the data or the findings of the study (see Responses C.7. and C.8.). EPA believes that the data support the reasonable potential determination presented in the Fact Sheet.

Comment C.12.

STATUTORY AND REGULATORY AUTHORITY

Phosphorus

The proposed permit includes a water quality-based effluent limitation for phosphorus even though New Hampshire does not have numeric nutrient criteria. EPA included this limitation in an attempt to interpret and implement the state's narrative criteria with respect to phosphorus. (Fact Sheet at 10) The pertinent part of this standard reads as follows:

> Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring… Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards.

Env-WS 1703.14.

The Fact Sheet (at 11) further notes that cultural eutrophication is defined in Env-Ws 1702.15 as, "… the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen."

This limitation was based upon application of EPA's 1986 Gold Book value for flowing waters. The Fact Sheet with the Draft Permit states that the Gold Book criterion was used because it was

developed from an effects-based approach versus eco-regional criteria which are based on reference conditions. (Fact Sheet at 11)

> "The effects-based approach provides a threshold value above which adverse effects (i.e., water quality impairments) are likely to occur. It applies empirical observations of a causal variable (i.e., phosphorus) and a response variable (i.e., chlorophyll *a*) associated with designated use impairments."

At a minimum, this narrative standard requires that there be a demonstration that the discharge is causing impairment, either excessive plant growth that impairs uses or plant growth that causes a dissolved oxygen criteria violation. Moreover, in applying the Gold Book criterion, there needs to be some showing that use impairment is occurring due to plant growth caused by the discharge of phosphorus from anthropogenic sources.

However, the only demonstration provided in the Fact Sheet is that the discharge from the City of Nashua POTW may cause an exceedance of the Gold Book value based on mixing under design flow conditions. EPA attempts to justify this approach citing 40 C.F.R. § 122.44(d)(1). As discussed below, application of the Gold Book criterion as presented in the Fact Sheet is not supported by any Clean Water Act (CWA) requirements. In issuing the Draft Permit, the Region has made three very important unsubstantiated assumptions: first, the Merrimack River is impaired by nutrients; second, the applicable numeric criteria should be the 0.1 mg/L suggested as a possible objective in the 1986 Quality Criteria of Water ("Gold Book"), and; three, the Town of Nashua WWTF is causing or contributing to an excursion above the assigned instream phosphorus criteria. As explained below, we have several significant objections with the assumptions and determinations made by the Region in developing this limit.

Response C.12.

The commenter incorrectly cites the phosphorus discussion in the Fact Sheet as being found on pages 10 and 11. The phosphorus section in the Fact Sheet is found pages on 19-24.

Please see Response C.8 for a detailed explanation of the legal and regulatory basis for imposing water quality based effluent limits in NPDES permits.

EPA will address these comments in detail as they are raised specifically below.

Comment C.13.

1. Misapplication of 40 C.F.R. § 122.44(d)

The CWA is a "science-based" statute that requires the establishment of criteria "accurately reflecting the latest scientific information" regarding "…the effects of pollutants on biological community diversity, productivity and stability…" Section 304(a)(1); *accord*, 40 C.F.R. 131.3(c) (criteria developed by EPA are based on "the effect of a constituent on a particular aquatic species"). No criteria (including a narrative criteria interpretation) can be approved unless it is "based on a sound scientific rationale". 40 C.F.R. 131.11(a). Likewise, the effluent

limit generated to meet the "applicable standard" must be demonstrated to be "necessary" and "which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria". 40 C.F.R. 122.44(d)(1)(vi). Obviously compliance with the statute and applicable regulations requires an objective scientific assessment to show that the selected approach is both necessary and sufficient to achieve criteria compliance.[14]

Given the language of the Act and the implementing regulations, it is not surprising that Courts have determined "that neither the language of the Act nor the intent of Congress appears to contemplate liability without causation" NAMF v. EPA, 719 F. 2d 624, 640 (3rd. Cir. 1983); Ark. Poul. Fed. V. EPA, 852 F. 2d 324, 328 (8th Cir. 1988) (the discharge must at least be "a cause" of the violation.) In the TMDL context, such nutrient wasteload allocations must be based on a documented "cause and effect" relationship using appropriate water quality models:

> An integral part of the TMDL process is the analysis of cause-effect relationships via a mathematical model of loading input and resulting water quality response.[15]

On its face, 122.44(d) itself indicates that more restrictive limits only apply if the discharge "causes" a water quality criteria excursion[16] as discussed in the *Upper Blackstone* decision. The *Upper Blackstone* decisions repeatedly refer to the fact that nutrients were demonstrated to be "causing" extensive "cultural eutrophication" as the basis for imposing more restrictive limitations.[17]

Because there are no such analyses for Merrimack River, EPA asserts that it may use the procedures identified in Section (d)(1)(vi) to not only develop an effluent limitation but to also use that endpoint to declare that the waters do not attain the state's narrative standard in the first instance. EPA is interpreting 122.44(d) in a manner inconsistent with the rule language, as well as the structure of the Act. Had EPA not done this, these stringent permit limits would never have been imposed.

A created numeric value cannot be used to determine that narrative criteria (which describes a desired physical or biological condition in the water body) are being violated. As with the New Hampshire narrative criteria, the Rhode Island narrative in the *Upper Blackstone* case also was based on preventing "cultural eutrophication" as evidenced by nutrients causing excessive algal

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[14] Sufficient does not mean that the individual facility must ensure WQS are attained, but that the selected criteria, when achieved will produce this result.

[15] Technical Guidance Manual for Developing Total Maximum Daily Loads Book 2: Rivers and Streams; Part 1: Biochemical Oxygen Demand/ Dissolved Oxygen and Nutrients/ Eutrophication. USEPA March 1997 at 4-27.

[16] The "or contributes" language means it is contributing to the "cause" of the violation.

[17] ***Upper Blackstone Water Pollution Abatement Dist. v. EPA*, 690 F.3d 9 (1st Cir. 2012)**
"An influx of nitrogen and phosphorus from sewage treatment plants ***is causing serious problems*** for the River's waters and those downstream. The Blackstone, Seekonk, and Providence Rivers, and Narragansett Bay, all suffer from severe cultural eutrophication." (at 11). "State water quality standards generally supplement these effluent limitations, so that where one or more point source dischargers, otherwise compliant with federal conditions, are nonetheless ***causing a violation of state water quality standards***, they may be further regulated to alleviate the water quality violation. Id. *§ 1311(b)(1)(C)* (at 14);

growth, low DO and other deleterious effects. In that case, the court first looked to see if the effects of "cultural eutrophication" existed and were documented to be caused by nutrients:

> An influx of nitrogen and phosphorus from sewage treatment plants is causing serious problems for the River's waters and those downstream. The Blackstone, Seekonk, and Providence Rivers, and Narragansett Bay, all suffer from severe cultural eutrophication.(at 11)…. Here, the EPA states, and the record reflects, that the MERL model demonstrated the relationship between nitrogen loading, dissolved oxygen, and chlorophyll *a* production for a range of loading scenarios in a water environment similar to the Bay's. (at 27). ***Subsequently,*** in order to address the severe and ongoing phosphorus-driven cultural eutrophication in the Blackstone River, the EPA incorporated a more stringent phosphorus limit into the 2008 permit. In formulating this limit, the EPA considered the national and regional guidance criteria and recommended values it had recently published. (at 31) (Emphasis supplied)

After this fact was confirmed the court determined that EPA's derivation of permit limits using the methods described in Section (vi) was acceptable, not that EPA could claim impairments based on those values absent documenting cultural eutrophication caused by excessive nutrient loads.

Under EPA's approach used in the City of Nashua's NPDES permit, "cultural eutrophication" (the condition intended to be regulated under the adopted narrative criteria) is equated with a numeric value to conclude more restrictive limits are "necessary" *even if the water body is not exhibiting signs of cultural eutrophication.* However, the NPDES regulation was intended to implement the adopted standard as closely as possible with the state's intent – not to substitute a new numeric value in place of it. See, *Am Iron and Steele v. EPA.*

The structure of the rule and "relevant" preamble discussion[18] confirms this is how the rule is to apply. Under Section 122.44(d)(1)(ii) the permit writer first determines if "a discharge… causes or contributes to an instream excursion". In the case of a narrative standard one looks to see if the characteristics that are intended to be prevented are evidenced in the waters (i.e., cultural eutrophication causing some type of system imbalance). If it is determined that an excursion is occurring (or likely to occur) then and only then "the permitting authority must establish effluent limits using one or more of the following methods…" The structure of the rule is clear; the methods for picking a protective instream level are only used to set the effluent limits, not to decide that the waters are in violation of the narrative standard. The 1989 preamble discussion

[18] The preamble indicates that one does not need to wait for impairment to trigger the application of a more restrictive limit under 122.44(d). That is true, but irrelevant. One may project a violation of a narrative standard (i.e., that "cultural eutrophication" is predicted to occur in the future) if adequate modeling or other reliable predictive capabilities are available, considering the physical parameters of the system. This would restrict future load INCREASES. However, in this instance, EPA is dramatically lowering the existing load to the system, claiming that it is currently far too high. In this case, EPA should be able to readily identify the existing cultural eutrophication and identify, with a reasonable scientific certainty, how phosphorus caused the excessive plant growth to occur. However, there is no such demonstration.

further supported that the methods used to derive the effluent limit was not the same method used to determine if an excursion existed:

> Subparagraph (i) should assist the permitting authority in determining whether it is necessary, under Federal regulations, to establish limits for a pollutant. Note, however, this is different from calculating water quality-based effluent limits. …Proposed subparagraph (iv) addresses the situation in which…the permitting authority does not have a numeric criteria to use *in deriving a water quality-based limit.*" 54 Fed. Reg. 1303,104 January 12, 1989 (emphasis supplied)

As is clear from these quotes, Section (vi) is used to set the permit limits *after the excursion (violation) is identified*, not to declare the waters in exceedance (violation) of a state's narrative standard. Any other approach would turn the structure of the Act on its head.[19] EPA is not implementing the adopted narrative standard; EPA is replacing it with a new numeric standard as if it was the adopted narrative standard. That plainly violates the Alaska Rule and 40 C.F.R. 131.21.

EPA is simply jumping over that process by claiming that exceeding a non-specific nutrient concentration constitutes a narrative criteria violation, regardless of whether or not nutrients are actually causing excessive plant growth or DO violations. Thus, it is apparent, that EPA's latest position is a major reinterpretation of 40 C.F.R. 122.44(d), without rulemaking and contrary to the structure of the Act. It is thus, therefore, patently illegal and may not be applied in this instance. *U.S. Telecom. Ass'n v. FCC*, 400 F.3d 29 at 35 ('a substantive change in the regulation,' requires notice and comment) (quoting *Shalala v. Guernsey Mem'l Hosp.*, 514 U.S. 87, 100 (1995).

Response C.13.

The criteria approval and TMDL process, and regulations and guidance pertaining thereto, are not directly applicable to this permit proceeding. There is no approved phosphorus TMDL for the segment of the Merrimack River into which the Nashua WWTF discharges. Moreover, EPA is implementing an existing narrative water quality standard for nutrients under Section 402 and 40 C.F.R. Part 122, so the criteria approval process is not relevant to its determinations. Manchester's legal objections have been resolved by the EAB's decision in *In re Town of Newmarket Treatment Plant*, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013), *slip op.* at 62-64, including the applicability of the Alaska Rule and whether the Region's

[19]Under EPA's approach, under Section 303(d) a state could determine that an area is not exhibiting "cultural eutrophication" and therefore not place the water on the Section 303(d) impaired waters list, regardless of the nutrient concentration present. However, when it comes time for permitting, EPA substitutes its chosen numeric criteria for the narrative standard and determines that a more restrictive limit is needed to meet the narrative criteria, contrary to Section 301(b)(1)(C) and the Section 303(d) determination which only allows the imposition of more restrictive water quality based limits where "necessary to meet the applicable water quality standards." The applicable standard is the narrative definition of the intended biological condition (e.g., no excessive plant growth).

derivation of an instream target for a pollutant under 40 C.F.R. § 122.44(d)(1) amounted to an illegal rulemaking.[20]

The commenter misquotes 40 C.F.R. §122.44(d)(1)(ii) above as stating that a permit writer first determines if "*a discharge… causes or contributes to an instream excursion*." The regulation actually states that the permitting authority must determine whether "*a discharge causes, has the reasonable potential to cause, or contributes to an instream excursion.*" As stated in Response C.8. above and restated here, EPA is not required to demonstrate that nutrients are "causing" extensive "cultural eutrophication" but simply that there is the "reasonable potential to cause" such water quality excursions.

Manchester's interpretation of the First Circuit's decision in Upper Blackstone is entirely without merit. Manchester contends that the *Upper Blackstone* decision actually stands for the proposition that "causation" must be proven prior to imposition of a water quality-based effluent limitation under 40 C.F.R. § 122.44(d), superficially pointing to the Court's use of the word "causing" and its reference to EPA's conclusion, based on a laboratory experiment, "that the basic causal relationship demonstrated in the MERL experiments 'corresponds to what is actually occurring in the Providence /Seekonk River system.'" Although the Court in *Upper Blackstone* may indeed have been convinced that EPA's record demonstrated that the District's treatment plant was "causing" a water quality standards excursion, it nowhere suggested that such a finding was necessary prior to imposing a water quality-based effluent limitation. On the contrary, the court specifically acknowledges the full breadth of the regulations:

> EPA regulations require permitting authorities to include in NPDES permits conditions which control all pollutants or pollutant parameters . . . [that] are or may be discharged at a level which will cause, *have the reasonable potential to cause*, [emphasis supplied] or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. We thus reject the notion that in order to strengthen the District's discharge limits, the EPA must show that the new limits, in and of themselves, will cure any water quality problems [internal quotation marks and citations omitted]. *Upper Blackstone Water Pollution Abatement Dist. v. U. S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012).

Manchester's reading of the case is impossible to reconcile with the Court's view that, "[R]ecognizing…the developing nature of [the field]…[t]he [EPA] Administrator may apply his expertise to draw conclusions from suspected, but not completely substantiated, relationships between facts, from trends among facts, from theoretical projections from imperfect data, from probative preliminary data not yet certifiable as 'fact,' and the like." *Id.* at 24 (quoting *Ethyl Corp. v. EPA*, 541 F.2d 1, 27-28 (D.C. Cir. 1976). Manchester should be aware that the

[20] This is unsurprising, as the Region notes that the commenter has merely copied and pasted portions of petitioner's submissions in the Newmarket permit appeal. *See* http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal%20Number/E3E03BFDEDDDF6D485257B21006F63D0/$File/Reply%20to%20EPA's%20Memo%20in%20Opposition%20...40.pdf. EPA rebutted that filing at http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal%20Number/B85DF6EB6B3EC40B85257B320044E0D9/$File/Respondent%20EPA's%20Sur-Reply...46.pdf and, in the interest of efficiency, incorporates those responses here.

reasonable potential determinations in the Blackstone permit were *not* based on a causal model, but correlations among data sets, as here.

Similarly, Manchester badly misreads the Board's decision in the Blackstone case, where it held, the "[Agency] does not need to justify the decision to impose a permit limit based on a site-specific demonstration that nutrients are causing the claimed impairments in the water body of concern, but need only demonstrate that the discharge causes, *has the reasonable potential to cause, or contributes* to an in-stream excursion above a numeric or narrative criteria within a state water quality standard." *In re Upper Blackstone Water Pollution Abatement Dist*., NPDES Appeal Nos. 08-11 to 08-18 & 09-06, slip op. at 32 (May 28, 2010).

EPA rejects the commenter's premise that the receiving waters are not evidencing signs of cultural eutrophication. As described in Responses C.7. and C.8. above, EPA believes there is sufficient evidence of algal growth and DO violations in the Merrimack River in the receiving water in the vicinity of the discharge to conclude that New Hampshire's narrative criteria regarding cultural eutrophication have been violated. In fact, the segment of the Merrimack River into which the Nashua WWTF discharges (NHRIV700061206-24), is impaired for chlorophyll *a*, which is indicative of nutrient enrichment. This is contrary to the commenter's assertion that EPA is equating cultural eutrophication with a numeric value "*even if the water body is not exhibiting signs of cultural eutrophication.*" In fact, the data illustrates DO supersaturation (>100%) and an increase in chlorophyll *a* (>15 µg/l), both of which are indications that cultural eutrophication is occurring in the vicinity of the discharge. Also contrary to the comment above, EPA is not required to demonstrate that the receiving water does not attain water quality standards before applying a permit limit. Nor is EPA required to demonstrate that an excursion is "likely to occur." Rather, EPA is required to demonstrate that there is *reasonable potential* for the discharge to cause or contribute to a water quality violation. In this case, reasonable potential was determined based upon the documented excursions above the EPA interpreted numeric criterion (0.1 mg/l) combined with instream evidence of excessive downstream algal growth.

Manchester's claim that EPA erred by consulting 40 C.F.R. § 122.44(d)(1)(vi)(A) for guidance on how to interpret the narrative criterion is unfounded. EPA in issuing an NPDES permit must, by necessity, translate existing narrative criteria into instream numeric concentrations when developing water quality-based effluent limitations. *Am. Paper Inst., Inc. v. EPA*, 996 F.2d 346, 351 (D.C. Cir. 1993). The process of translating or interpreting a narrative criterion is governed by 40 C.F.R. § 122.44(d)(1)(vi), subsection (A) of which describes a process for calculating a protective instream numeric concentration for the pollutant of concern. This calculated numeric instream target, along with other information relied on by EPA such as evidence of elevated chlorophyll *a* and total phosphorus levels in the receiving waters, is facially relevant and material to EPA's determination of whether the receiving water's assimilative capacity for phosphorus had been reached, and whether a reasonable potential for the discharge to cause, or to contribute, to a water quality criterion exceedance exists. The commenter fails to identify any reason why EPA should be precluded from utilizing an instream numeric target as a part of its reasonable potential analysis, which as described above was intended to be a flexible process to allow the permit writer to carry out the objectives of the Act, including ensuring compliance with state

water quality standards. The commenter, moreover, neglects to describe what alternative technical methodology, other than a conclusive cause-and-effect demonstration, it would employ in order to make such a reasonable potential determination.

The proposed numeric thresholds are neither new nor revised water quality standards, so the alleged significance of the "Alaska Rule" is misplaced. In this instance, the only applicable standard in the State water quality standards are *existing* approved narrative criteria for nutrients, which, as explained above, require translation or interpretation in order to yield a numeric effluent limitation. The legal/regulatory requirements associated with criteria adoption are not applicable to permitting decisions based on existing criteria, such as the New Hampshire narrative nutrient criterion applicable in this proceeding.

Similarly, issues associated with impaired waters designation are more appropriately addressed through the 303(d) listing process. Independent of any State decisions associated with 303(d) lists, EPA clearly documented a reasonable potential to exceed the narrative nutrient criteria in the Fact Sheet and has affirmed that conclusion through this Response to Comments document.

As stated in footnote (12) above, "the preamble indicates that one does not need to wait for impairment to trigger the application of a more restrictive limit under 122.44(d)." The commenter claims that this is irrelevant because it should be interpreted to apply to future increased loads. However, the preamble specifically states that "more restrictive limits" may be applied, indicating a reduction from current levels, and furthermore says nothing about any reasonable potential findings having to be based on cause-and-effect models or demonstrations.

Comment C.14.

2. Waters Not Listed as Nutrient Impaired

Under section 303(d) of the Clean Water Act, New Hampshire is given primary authority for identifying which of its waterbodies are not meeting the governing water quality standards and for what reasons. EPA has limited authority (inapplicable in this instance) to intrude into this State responsibility. With regard to Merrimack River, New Hampshire has never identified the waterbody as nutrient impaired on the State's 303(d).[21] Moreover, Region 1 specifically approved New Hampshire's decision not list the waterbody as nutrient impaired, indicating that the current instream conditions and loadings are acceptable. If EPA wishes to amend a State's 303(d) listing decision, there is a specific process for doing so. Until such steps are taken, however, EPA has no authority to presume nutrients are impairing Merrimack River or assert that a narrative criteria violation related to nutrients exists in this waterbody.

Response C.14.

See Responses C.8. and C.13. for a more detailed discussion.

[21] As mentioned in the Draft Permit, stretches of the Merrimack River are identified as impaired by aluminum, dissolved oxygen, pH, and *Escherichia coli*. Unlike numerous other waterbodies in New Hampshire, chlorophyll *a* (surrogate for plant growth) is not the basis of impairment.

Including a limit in the permit for a particular pollutant is not dependent on the receiving water being listed as impaired for that pollutant. Regardless of whether waters are listed as impaired under Section 303(d), EPA has an independent duty under Section 301(b)(1)(C) of the Act to impose limits as stringent as necessary to meet applicable water quality standards. As stated in Response C.13., "The preamble indicates that one does not need to wait for impairment to trigger the application of a more restrictive limit under 40 C.F.R. § 122.44(d)."

Comment C.15.

3. State Narrative Criteria Misapplied

Currently, the only duly promulgated New Hampshire water quality criteria addressing nutrients in estuaries are found at Env-Wq 1703.14(b), which states:

> *Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring*. (emphasis supplied). The regulations continue:
>
> *Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated … to ensure attainment and maintenance of water quality standards.* Env-Wq 1703.14(c).
>
> *"Cultural eutrophication" is defined as "human-induced addition of wastes containing nutrients to surface waters which results in excessive plant growth and/or a decrease in dissolved oxygen."* Env-Wq 1702.15.

DES also has a narrative standard regarding "aquatic community integrity," which indicates, in relevant part, that "differences from naturally occurring conditions shall be limited to non-detrimental differences in community structure and function." Env-Wq 1703.19(b).

The key evidentiary component of the narrative nutrient criterion is that a violation is only found when it is demonstrated that phosphorus *is causing* an impairment (*e.g.*, "in such concentrations that would impair"; "human-induced addition of … nutrients … which results in"). This requires a "cause and effect" demonstration to find a violation of the narrative criteria. In issuing the Draft Permit, EPA relied on the Gold Book phosphorus criterion as an appropriate "narrative translator" and applied the Gold Book phosphorus criterion as though it represented a toxic substance by applying the criterion at the 7Q10 stream flow. However, the Gold Book notes that phosphorus concentrations critical to noxious plant growth vary and nuisance growth may result from a particular concentration of phosphate in one geographical area but not in another. Thus, even the Gold Book, upon which EPA relied upon to identify a potential criterion, cautioned that adverse effects cannot be assumed but must be confirmed.

To claim a nutrient limitation is necessary to eliminate use impairments and protect ecological resources under the state's narrative standard, EPA must first demonstrate that the nutrient at issue (phosphorus) caused the impairment, otherwise defined as "cultural eutrophication" (excessive algal growth causing impairment such as DO violations – Env-Wq 1702.15) under

state law. Moreover, any "narrative translator" must be based on a system-specific defined "cause and effect" relationship showing the nutrients have caused such "cultural eutrophication."

The permit action is premised on the *assumption* that the waters are nutrient impaired, that the Gold Book phosphorus criterion is an appropriate numeric translator, and that a simple mass balance under design conditions is sufficient to demonstrate reasonable potential. However, there is no indication that "cultural eutrophication" has occurred as a result of the discharge, and the 303(d) list does not identify the waters as impaired by nutrients.

- **Deposition Testimony Confirmed Cause and Effect Demonstration Required for Narrative Criteria Violation**

The DES has identified the Great Bay Estuary as nutrient impaired based on a scientifically deficient draft criteria document specific to the estuary, and EPA has applied the draft criteria in setting NPDES limits for several municipal dischargers to the estuary. This action was challenged and several DES staff were deposed and gave testimony on application of the state's narrative nutrient criteria. Mr. Paul Currier of DES confirmed that any claim of narrative criteria violations requires a documented *causal relationship* between nutrients and excessive plant growth adversely impacting designated uses (*See* Currier Dep. at 18, 19, 134)[22].

The Gold Book phosphorus criterion cannot be a proper translator of the existing narrative criteria without a causal demonstration that phosphorus is causing cultural eutrophication. Moreover, both Mr. Currier and Mr. Trowbridge noted that merely exceeding values contained in the draft 2009 Criteria (and, in this case, the Gold Book criterion) does not provide a demonstration that a narrative violation exists. (Currier Dep. at 80; Trowbridge Dep. at 332-333)

Based on these sworn acknowledgements on how state law is intended to operate, it was improper for EPA to presume that the exceeding the Gold Book levels will or has caused impairment anywhere in the Merrimack River. It was equally improper for EPA to presume that attaining compliance with the numeric values contained in the Gold Book, was necessary to avoid violating the state's narrative criteria. Finally, it was also improper to presume that the Gold Book criterion accurately reflected the level of scientific demonstration required by the existing narrative standard to designate waters as nutrient impaired. Such speculation is not a basis for narrative criteria implementation and does not constitute "weight of evidence" that phosphorus has triggered narrative criteria violations as assumed in EPA's proposed permitting action. Consequently, the necessary evidence to support use of the Gold Book criterion as a "narrative translator" has not been provided and the use of the Gold Book criterion is this permit action is arbitrary and capricious.

Response C.15.

Deposition testimony of NHDES staff (or rather Manchester's argumentative interpretation thereof) does not supplant EPA's obligations under section 301(b)(1)(C) of the Act to ensure

[22] Full copies of the Currier, Short and Trowbridge Depositions, plus exhibits have been provided to EPA by the Coalition's counsel. Due to the voluminous nature of those documents they are not being resubmitted with these comments.

compliance with state water quality standards or to implement its regulations, including those pertaining to reasonable potential. Again, Manchester's legal objections have been resolved by the EAB's decision *In re Town of Newmarket Treatment Plant*, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013), including issues relating to cause-and-effect and relevance of the NHDES depositions, which the Region adopts here. EPA simply fails to see the relevance of deposition testimony in an unrelated state court proceeding to the federal permit proceeding here.

Manchester appears to believe that EPA's NPDES regulations require cause-and-effect proof between a pollutant discharge and a water quality impairment before the permit writer can derive a numeric instream target to interpret a narrative water quality criterion, or impose a water quality-based effluent limitation to implement that criterion. Manchester fundamentally misunderstands—or simply ignores—the legal threshold under 40 C.F.R. § 122.44(d)(1)(i) for determining the need for a water quality-based effluent limitation (***i.e.***, "reasonable potential"), and the types of information that may be used to establish that limit (***e.g.***, "relevant information"). ***Id.*** at § 122.44(d)(1)(vi). Under NPDES regulation, permit issuers are required to determine whether a given point source discharge "cause[s], ha[s] the reasonable potential to cause, or contribute[s] to an excursion above" the narrative or numeric criteria set forth in state water quality standards. 40 C.F.R. § 122.44(d)(1)(i). Thus, the regulations require nothing more than a *reasonable potential to cause, or contribute to* an excursion of a numeric or narrative state water quality criterion; whenever such a potential exists, a permit must contain effluent limits to meet state water quality standards. ***See id.*** § 122.44(d)(1), (5) (providing in part that a permit must incorporate any more stringent limits required by CWA § 301(b)(1)(C)). "'Reasonable potential' requires some degree of certainty greater than a mere possibility, but it leaves to the permit writer's scientific and technical judgment how much certainty is necessary." ***See In re Upper Blackstone Water Pollution Abatement Dist.***, NPDES Appeal Nos. 08-11 to 08-18 & 09-06, slip op. at 32-33, n.29 (May 28, 2010). As EPA's preamble to its final rulemaking promulgating 40 C.F.R. § 122.44(d)(1)(vi) explained:

> Some commenters said that the phrase "reasonable potential to cause" was too vague and could apply to permittees that are not actually exceeding a water quality criterion. EPA does not believe that it is appropriate to be more specific because a permitting authority has a significant amount of flexibility in determining whether a particular discharge has a reasonable potential to cause an excursion above a water quality criterion, taking the factors in subparagraph (ii) into account.

54 Fed. Reg. 23,868, 23,873 (June 2, 1989). This regulatory provision has been upheld as a reasonable, authorized approach of necessary gap-filling in the CWA statutory scheme as it provides permit writers with guidance on how to interpret state narrative water quality standards in deriving effluent limitations. ***See Am. Paper Inst. v. EPA***, 996 F.2d 346, 348, 351 (D.C. Cir. 1993); ***see also Am. Iron & Steel Inst. v. EPA***, 115 F.3d 979, 990-991 (D.C. Cir. 1997). ***Upper Blackstone***, slip op. at 31-32 (The "regulations . . . require a precautionary approach when determining whether the permit must contain a[n] effluent limit for a particular pollutant."); ***accord Upper Blackstone Water Pollution Abatement Dist. v. U. S. EPA***, 690 F.3d 9, 33 (1st Cir. 2012) ("EPA regulations require permitting authorities to include in NPDES permits conditions which control all pollutants or pollutant parameters . . . [that] are or may be discharged at a level

which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. We thus reject the notion that in order to strengthen the District's discharge limits, the EPA must show that the new limits, in and of themselves, will cure any water quality problems." (internal quotation marks and citations omitted)). EPA in the Final Rule Preamble for 40 C.F.R. § 122.44(d)(1) dispels any doubt over the necessity of proving an impairment and causation of that impairment prior to either deriving a numeric instream target to implement a narrative water quality criterion, or imposing a water quality-based effluent limitation to implement that criterion:

> Several commenters asked if it was necessary to show in-stream impact, or to show adverse effects on human health before invoking [§ 122.44(d)(1)(vi)] as a basis for establishing water quality-based limits on a pollutant of concern. It is not necessary to show adverse effects on aquatic life or human health to invoke this paragraph [iv]. The CWA does not require such a demonstration and it is EPA's position that it is not necessary to demonstrate such effects before establishing limits on a pollutant of concern.

54 Fed. Reg. at 23,878. EPA's preamble explanation of what is actually required is at odds with the City's view that a mathematical model, or controlled experiment, demonstrating direct cause and effect related to harm is the standard to which EPA should be held in the NPDES permitting process.

EPA agrees that merely exceeding the 0.1 mg/l instream value does not demonstrate that a narrative water quality violation is occurring. However, such a violation does not need to be demonstrated in order to determine that a discharge has the reasonable potential to cause or contribute to a future violation. In this case, however, EPA believes that evidence of a violation does exist (*see, e.g.*, Response C.7.. and C.8.) which confirms the reasonable potential determination and supports the inclusion of a total phosphorus permit limit. EPA imposed the limit only after weighing all the evidence before it, including water quality data pertinent to cultural eutrophication, as well as different methodological approaches and values from the scientific literature.

Comment C.16.

4. No Evidence of Excessive Algal Growth

The conceptual model relating nutrients to aquatic life impairment requires that nutrient loads stimulate aquatic plant growth which, in turn, causes an adverse effect (e.g., dissolved oxygen criteria violations, impaired macroinvertebrate communities). That is, "cultural eutrophication" is a prerequisite to narrative criteria implementation. This model is well known and documented in EPA's Gold Book (1986), the Technical Guidance Manual for Developing Total Maximum Daily Loads (EPA, 1995)[23], the Protocol for Developing Nutrient TMDLs (EPA, 1999)[24], and

[23] USEPA. September 1995. Technical Guidance Manual for Developing Total Maximum Daily Loads. Book II: Streams and Rivers. Part 1: Biochemical Oxygen Demand/Dissolved Oxygen and Nutrients/Eutrophication. EPA 823-B-95-007.
[24] USEPA. November 1999. Protocol for Developing Nutrient TMDLs. First Edition. EPA 841-B-99-007

EPA's guidance on Using Stressor-response Relationships to Derive Numeric Nutrient Criteria (2010)[25].

> [I]f the maximum possible chlorophyll *a* level that could be achieved is extremely low, it will usually be safe to conclude that nutrients do not pose a problem in relation to water column algae.
>
> In most natural systems, especially flowing streams, the actual chlorophyll *a* levels that occur will be substantially less than the maximum potential under a combination of ideal conditions. Collection of chlorophyll *a* data could be used to verify the estimated chlorophyll *a l*evels and to determine whether a problem exists.
>
> (Technical Guidance Manual at 4-8)

If the designated use impairment identified for the Merrimack River (chlorophyll *a*, primary contact recreation as outlined on pg. 11 of 36 of the Draft Permit) is due to phosphorus, there must be a showing that algal levels in the river are elevated and these elevated algal levels cause or contribute to the low dissolved oxygen. However, there are no data reported in the Fact Sheet that address algal concentrations in the river that contributed to low dissolved oxygen. Without any data to support a key component of the conceptual model, EPA's presumption that phosphorus is causing a violation of the state's narrative criteria is arbitrary and capricious.

Response C.16

As described in Responses C.7. and C.8. above, EPA believes there is sufficient evidence of algal growth in the Merrimack River in the vicinity of the discharge to conclude that New Hampshire's narrative criteria have been violated. The data illustrates DO supersaturation (>100%) and a peak in chlorophyll *a* (>15 µg/l), both of which are indications that "cultural eutrophication" is occurring downstream of the discharge. As described in the Fact Sheet, the 15 µg/l threshold used by the NHDES CALM for primary contact recreation is only a guideline used for recreational purposes, not for aquatic life. The segment of the Merrimack River receiving the Nashua WWTF's discharge is within Ecoregion VIII, Nutrient Poor Largely Glaciated Upper Midwest and Northeast. The recommended criteria for this ecoregion is a total phosphorus concentration of 10 µg/l (0.01 mg/l) and a chlorophyll *a* concentration of 0.63 µg/l (0.00063 mg/l) (*Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII* (USEPA December 2001 [EPA 822-B-01-015]). Additionally, the following table provides a summary from the literature of the trophic status for fresh water systems as characterized by mean chlorophyll *a*[26].

[25] USEPA. November 2010. Using Stressor-response Relationships to Derive Numeric Nutrient Criteria. EPA-820-S-10-001.

[26] Algae are either the direct or indirect cause of most problems related to excessive nutrient enrichment; e.g., algae are directly responsible for excessive, unsightly periphyton mats or surface plankton scums, and may cause high turbidity, and algae are indirectly responsible for diurnal changes in DO and pH. Chl *a* is a photosynthetic pigment and sensitive indicator of algal biomass. It can be considered the most

Freshwater System Trophic Status Based on Mean Chlorophyll *a**				
Trophic Status	Wetzel (2001)	Ryding and Rast (1989)	Smith (1998)	Novotny and Olem (1994)
Eutrophic	> 10 µg/l	6.7 – 31 µg/l	---	>10 µg/l
Mesotrophic	2 – 15 µg/l	3 – 7.4 µg/l	3.5 – 9 µg/l	4 – 10 µg/l
Oligotrophic	0.3 – 3 µg/l	0.8 – 3.4 µg/l	---	< 4 µg/l

* Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll *a* for the Chesapeake Bay and Its Tidal Tributaries. U.S. EPA Region III. April 2003.

Based upon this literature, freshwater systems may be characterized as eutrophic at chlorophyll *a* concentrations as low as 6.7 µg/l. Compare this to the chlorophyll *a* samples collected in the vicinity of the Nashua discharge on July 27, 2010, which range from 16.09 µg/l to 19.26 µg/l (See Table 4 of the Fact Sheet, which references data presented in the *Upper Merrimack and Pemigewasset River Study Field Program 2009-2012 Monitoring Data Report*, U.S. Army Corps of Engineers dated December 2012)).

Applying the CALM state indicator threshold for primary contact recreation, the State of New Hampshire's 2010 *Final List of Threatened or Impaired Waters That Require a TMDL* designates the segment of the Merrimack River into which the Nashua WWTF discharges (NHRIV700061206-24) as impaired for chlorophyll *a*.

In consideration of the available information, which suggests eutrophic conditions in the Merrimack River are currently occurring, as well as the finding that the discharge has reasonable potential to cause or contribute to a violation of water quality standards, the total phosphorus limit in the Final Permit is necessary.

Comment C.17.

5. Gold Book Not Applicable as Criteria without Site-Specific Data Confirmation

As described above, EPA simply assumed that the Gold Book's 0.1 mg/L preliminary recommendation for phosphorus was the applicable instream target for the Merrimack River without using any site-specific data to confirm (1) the existence of a nutrient impairment or (2) whether such a criterion is necessary to protect the applicable uses. In so doing, EPA has effectively adopted a numeric criterion for all similar-situated waters in the state (i.e., free-flowing without a direct link to a lake or reservoir). Moreover, in this case, EPA has effectively concluded that 0.1 mg/l limit should be applied to all flowing waters without considering any of the relevant physical factors or whether the nutrient level is actually causing any use impairment. Such EPA action is both procedurally and substantively improper. First, States have primary authority to amend existing water quality standards and all amendments (state or federal) must be subjected to a public notice and comment process. For other states where EPA has determined that a numeric criterion was the applicable translator for a state's narrative standard, EPA has undergone notice and comment rulemaking. This is required by 40 C.F.R. §§ 131.21 and 22.

important biological response variable for nutrient-related problems. *Nutrient Criteria Technical Guidance Manual Rivers and Streams* (EPA-822-B-00-002 July 2000).

EPA's recent nutrient criteria adoption action in Florida was an example of such agency decision-making. Second, the Gold Book does not recommend that a 0.1 mg/L TP nutrient level be established for streams. Rather, the Gold Book expressly qualifies its recommendation for nutrients because of the dynamic interplay nutrients have with individual ecosystems and the range of potentially appropriate nutrient levels given varied site-specific conditions.[27] Thus, the Region has also failed to properly apply the recommended approach specified in the "Gold Book."

Response C.17.

As already explained, the Region imposed permit limits on a site-specific basis and has *not* "adopted a numeric criterion for all similar-situated waters in the state" in implementing the existing narrative criteria. Rather, the Region has translated the State's narrative criterion in accordance with 40 C.F.R. § 122.44(d)(1)(ii) and (vi), which allow consideration of EPA technical guidance and recommended criteria, including the Gold Book. The record clearly shows that EPA evaluated site-specific data in making a determination that a phosphorus limit was "necessary" within the meaning of regulations governing the NPDES permitting process.

Contrary to the comment, the Gold Book does cite the 0.1 mg/l as a recommended value for free-flowing streams. However, EPA agrees that the Gold Book elaborates on site-specific natural conditions that dictate the consideration of either a more or less stringent phosphorus level. Specifically, page 241 of the Gold Book states:

> "*There are natural conditions, also, that would dictate the consideration of either a more or less stringent phosphorus level. Eutrophication problems may occur in waters where the phosphorus concentration is less than that indicated above [100 μg/l] and, obviously, such waters would need more stringent nutrient limits. Likewise, there are those waters within the Nation where phosphorus is not now a limiting nutrient and where the need for phosphorus limits is substantially diminished. Such conditions are described in the last paragraph of this rationale.*"

This rationale indicates that in any free-flowing stream where total phosphorus is a limiting nutrient (such as the portion of the Merrimack River in question), the recommended total phosphorus value would be either 100 μg/l or less, if eutrophication problems could potentially occur at a lower concentration. The paragraph referenced above is found on page 243 of the Gold Book as follows:

"*It should be recognized that a number of specific exceptions can occur to reduce the threat of phosphorus as a contributor to lake eutrophy:*

1. Naturally occurring phenomena may limit the development of plant nuisances.

[27] Quality Criteria of Water (Gold Book) EPA 440/5-86-001 (May 1, 1986) (Recognizing that instream phosphorus levels "do not directly impact streams and rivers" and that "a number of specific exceptions can occur to reduce the threat of phosphorus"). Furthermore, EPA's document entitled "National Recommended Water Quality Criteria – Correction" (USEPA April 1999) specifies that no numeric recommendation has been proposed for phosphorus – only a "narrative statement" applies. This narrative statement requires consideration of site-specific information on whether or not the nutrient level is actually causing excessive plant growth and impairment of uses.

2. Technological or cost-effective limitations may help control introduced pollutants.
3. Waters may be highly laden with natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis.
4. Some waters morphometric features of steep banks, great depth, and substantial flows contribute to a history of no plant problems. Waters may be managed primarily for waterfowl or other wildlife.
5. In some waters nutrient other than phosphorus is limiting to plant growth: the level and nature of such limiting nutrient would not be expected to increase to an extent that would influence eutrophication.
6. In some waters phosphorus control cannot be sufficiently effective under present technology to make phosphorus the limiting nutrient."

In this case, the Nashua WWTF discharges into a free-flowing segment of the Merrimack River with evidence of eutrophication downstream (see Response C.8.) and with no lakes or impoundments immediately downstream. Based on the DO and chlorophyll *a* data which suggests that eutrophication is occurring downstream (see Response C.8.), it is clear that items one through four are not characteristic of the receiving water to the extent that they preclude nutrient growth. Additionally, EPA believes that phosphorus is a limiting nutrient in the receiving water and that it can be sufficiently controlled to effectively limit nutrient-related impairment (addressing items five and six). Hence, EPA considers the Gold Book value (100 µg/l) to be appropriate and protective given the site-specific ecological setting and a total phosphorus limit is thus justified and necessary to meet this instream target. EPA made this determination only after considering a range of other potential instream values in addition to the Gold Book, and upon reviewing the available water quality data pertaining to eutrophic response variables in the receiving water.

Comment C.18.

6. Reference Waters

The Fact Sheet discusses several guidance documents which contain recommended total phosphorus criteria based on an evaluation of the concentration of phosphorus expected in reference waters. Although the Fact Sheet notes that EPA did not choose to apply a reference-based phosphorus criterion, we note that such application is inconsistent with New Hampshire's narrative criterion, which requires a demonstration that phosphorus is causing excessive plant growth and/or dissolved oxygen impairment. Moreover, the application of reference-based nutrient criteria to implement the state's narrative criterion was rejected by the court in the State of Florida (February 2012).

The circumstances in Florida are identical to the circumstances in New Hampshire. Both narrative criteria limit nutrient concentrations to prevent designated use impairments. The court found that reference-based criteria are premised on preventing any change in nutrient concentrations that increase above the "reference" concentration. However, the narrative criteria limit increases in nutrient concentrations above the concentration that causes harm. Consequently, before the reference-based criteria can be applied, EPA must first demonstrate that these criteria are set at a threshold above which use impairment is caused by phosphorus.

Response C.18.

For reasons discussed above, EPA disagrees with the claim that a cause-and-effect link must be established between phosphorus and cultural eutrophication in the receiving water prior to implementing the state's narrative nutrient water quality standard through an NPDES permit limit, regardless of the methodological approach (*i.e.*, effects-based or reference). The decision cited to by Manchester is inapposite, and did not involve the circumstances under which EPA could impose of effluent limitations under Section 402 and 301 of the Act to implement an existing narrative water quality standard. As described in the Fact Sheet and acknowledged by the commenter, EPA did not choose to apply the reference-based Ecoregion phosphorus criterion, but rather the effects-based EPA Gold Book criterion as a numeric interpretation of New Hampshire's narrative water quality standards. This choice was based on a determination that the referenced-based criterion might be more stringent than necessary, based on the methodology used to generate the value, not on a reading of the NH WQS. Had it been determined that the reference-based criterion were more appropriate, EPA would simply need to demonstrate that this criterion is protective of water quality standards.

Comment C.19.

7. 7Q10 Flow Inappropriate for Nutrient Regulation

The phosphorus limit proposed in the City of Nashua permit was based and developed upon the calculated 7Q10 flow. However, nutrients are not toxics and their impacts are manifested over a growing season as discussed in EPA's Protocol for Developing Nutrient TMDLs (1999) (at 4-3).

> TMDL developers should be aware that nutrient problems tend to be seasonally expressed and in many cases might result from the accumulation of year-round loadings.

Criteria based on the prevention of toxic effects utilize low flow conditions in the development of water quality-based effluent limits to ensure that adverse effects, which are expressed over a short exposure period, do not occur. However, impairments associated with nutrients are not expressed in the same way. Rather, nutrient concentrations must stimulate plant growth which then causes use impairment. This conceptual model has a longer averaging period and does not require application under extreme low flow conditions as discussed in EPA's NPDES Permit Writers' Manual (September 2010).

> [T]he recommended nutrient criteria represent conditions of surface waters that have minimal impacts caused by human activities rather than values derived from laboratory toxicity testing.
>
> [S]tates may adopt seasonal or annual averaging periods for nutrient criteria instead of the 1-hour, 24-hour, or 4-day average durations typical of aquatic life criteria for toxic pollutants.
>
> (NPDES Permit Writers' Manual at 6-6)

Thus, it is well-settled that nutrient concerns for streams and rivers, to the extent they exist at all, are only a concern during the growing season (e.g. April – September). During this period, snow melt and wet weather result in stream flows typically far greater than 7Q10. As a result, the proposed limit was developed using a non-representative flow and is, consequently, unnecessarily stringent.

Response C.19.

The Clean Water Act requires that effluent limitations meet State water quality standards; therefore if a state's water quality standards require that water quality-based effluent limits be based upon a single, non-seasonal receiving water low flow to, for instance, introduce pollutant buffering capacity in the receiving water, the Clean Water Act would not allow these limits to be based on seasonal flows. Use of critical low flows to develop permit limits is consistent with New Hampshire Standards (*See* Env-Wq 1705.02(d), and with the reasonably conservative approach the Region has adopted in nutrient permitting in general. The Region has determined it is necessary in this case in particular to address evidence of cultural eutrophication in the receiving waters. Additionally, EPA notes that 7Q10 critical low flow conditions would typically occur during portions of the growing season (July – August) and are, thus, appropriate for permit limit development. During the growing season, when light and temperature are optimal for plant growth and the receiving water is subject to elevated nutrients concentrations, aquatic plant biomass growth can proliferate in relatively short periods of time. A permit limit of 0.1 mg/l calculated using seasonal flows would have the potential to allow periods of excessive loading of nutrients during and around critical low flow conditions while still meeting the overall limit. The resulting biomass from any plant growth would violate water quality standards and have the potential to settle into the sediments and contribute to future water quality violations. It is imperative, therefore, to ensure that phosphorus effluent discharges from the WWTF and the resulting ambient phosphorus concentrations are maintained at consistently low levels. A phosphorus effluent limit that assumes worst case hydrological conditions will accomplish the objective of maintaining consistently low phosphorus instream concentrations.

Comment C.20.

Based on these comments, it is respectfully requested that the Region withdraw the phosphorus, copper and lead limits from the Draft Permit. Under New Hampshire law, a narrative criteria violation requires some demonstration that a water body is being impaired by nutrients. The MPR-Study conducted on the Merrimack River by the USACOE demonstrated that this impairment does not exist. To impose a phosphorus limit, the Region must demonstrate that nutrients are, in fact, causing impairments in the Merrimack River and develop an instream phosphorus target based on the site-specific data used in that determination. Moreover, it is inappropriate to presume that a 0.1 mg/L TP level is required to protect all flowing waters from nutrient impacts. It is also scientifically inappropriate to base the proposed limit on the rarely occurring 7Q10 flow that does not control the degree of plant growth occurring in the river. Given the assumptions in the Region's approach to interpreting the state's narrative standard and setting phosphorus limits, the draft provision of 0.06 mg/l should be withdrawn.

Response C.20.

Based on EPA's responses above to each of the issues raised herein, the total phosphorus limit will remain in the Final Permit.

D. Comments from Martha Morgan, Water Programs Director, Nashua River Watershed Association ("NRWA")

Opening Comment:

The NRWA's goal for the Nashua River is to protect water quality for a variety of uses, including wildlife, fish and recreations. The Nashua River is an important recreational resource for local communities; the continued enjoyment of the river and survivability of aquatic life and wildlife depend on ongoing improvements in water quality.

There is renewed interest in the health of the Nashua River and its relation to economic viability in downtown Nashua, as evidenced by the newly-formed Nashua Waterways Committee. NRWA supports this revived interest in the river, and has a team of volunteer monitors sample at four sites along the Nashua River in downtown Nashua once a month from April to October to evaluate water quality.

NRWA is pleased that the City of Nashua has upgraded the Nashua Wastewater Treatment Facility, added the Wet Weather Flow Treatment Facility and will be providing at least primary disinfection treatment to high stormwater flows in the future, and understands the City has done so at considerable expense.

Response to Opening Comment:

EPA acknowledges the comment.

Comment D.1.

NRWA, in general, supports the provisions of the NPDES permit. Our comments primarily concern CSOs into the Nashua River. NRWA's overarching goal for the Nashua River would be to eliminate all CSOs entirely from occurring into the river. However, given that such events will occur, we request that the NRWA and public be notified of the timing, flow duration and volume when a CSO has occurred.

Condition #4 of the State Permit Conditions required under New Hampshire Statute RSA 485-A13, I(c), that "the wastewater facility shall give immediate notice of a bypass or upset to all public or privately owned water systems drawing water from the same receiving water and located within 20 miles downstream of the point of discharge regardless of whether or not it is on the same receiving water or on another surface water to which the receiving water is tributary".

NRWA requests that this notice be extended to the general public via a newspaper notice or website posting, for both the CSOs entering the Merrimack River and the CSOs along the Nashua River. Ideally, this notice would occur immediately following the CSO event, and not weeks or months later. Of particular concern are CSOs #7 and #8, located most upriver along the Nashua (and hence, affording more opportunity for river-to-people contact through downtown).

Notice of when, where and for how long CSOs occur, and the total volume released, should be made available for the safety of the public. NRWA's volunteers sample during and after wet weather events, and knowledge of CSO occurrence would allow us to extend a cautionary notice to our volunteers. Additionally, we would incorporate information regarding CSOs into year-end data reports.

Response D.1.

The conditions under which CSO discharges may occur are the nine minimum controls (NMCs) set forth in Part I.B of the Draft Permit. NMC #8 requires the implementation of a program to provide the public with adequate notification of CSO occurrences and impacts (i.e., a "public notification program"). Part I.B spells out numerous requirements relating to the NMCs including, but not limited to, requirements for:

- reviewing and updating its NMC implementation program within 12 months of the effective date of the permit (Part I.B.1.c),
- updating its website to include the most current information on CSO activations within six months of the effective date of date of the permit (Part I.B.3.e (6)), and
- developing a planned notice list for CSO discharges within one month of the effective date of the permit (Part I.B.3.e (7)).

EPA encourages the City to incorporate the suggestions in the above comment in any revisions to its public notification program. The City should consider broadening the notifications to downstream water supply systems of CSO discharges as set out in Part I.B.3.e (7) to include persons or groups requesting such notice, providing real-time notice on the City's web site, and/or providing e-mail notifications within 24 hours of the onset of a CSO discharge to persons or groups requesting such notice. Finally, it should be noted that the monitoring results which Manchester submits to EPA may be accessed by the public via the online tool *Enforcement and Compliance History Online* (ECHO), found at echo.epa.gov.