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

To the receiving waters named: **Merrimack River** (Wastewater Treatment Facility [outfall 001] and CSOs [outfalls #002-005]) 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 day of

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

*Pursuant to 40 CFR § 124.15(b)(3), if no comments requesting a change to the draft permit are received, the permit will become effective upon the date of signature.

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	mg/l	0.60 mg/l	—	Report	2/Week	24-Hour Composite
(April 1st – Oct. 1st)	lbs/day	Report	—	Report	2/Week	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}[9,10,11,12,13]	Percent	—	—	100	2/Year	24-Hour Composite
Ammonia Nitrogen, as Nitrogen[14]	mg/l	—	—	Report	2/Year	24-Hour Composite
Hardness[14]	mg/l	—	—	Report	2/Year	24-Hour Composite
Alkalinity[14]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Aluminum[14]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Cadmium[14]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Copper[14]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Lead[14]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Nickel[14]	mg/l	—	—	Report	2/Year	24-Hour Composite
Total Recoverable Zinc[14]	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 (CFR) 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 CFR 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 14) 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 p romelas* (*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. This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical-specific limits, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered "New Information" and the permit may be modified as provided in 40 CFR Section 122.62(a)(2).

13. 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**.

14. 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 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 and no snow melt. 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 CFR §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

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 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, the maximum value for *E. coli* shall be determined by calculating the geometric mean.

   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.

2. *E. coli* shall be analyzed using an approved method as specified in 40 CFR 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 six 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 rain and no snow melt (defined as a day in which the temperature is greater than 32˚ F). 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 CFR § 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 provide notification to the NHDES-WD orally within 24-hours of the discharge from a CSO. Written notification shall also be provided to NHDES-WD within 5 days of the discharge from a CSO.

h. 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 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 (expressed in inches), peak rainfall intensity (highest fifteen minute sample multiplied by four to convert to inches per hour), and average intensity (the total rainfall for the storm event divided by the duration of the storm, expressed in inches per hour), as required by Part I.B.2.e. of the permit.

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[4,5]
TSS[2,3]	30 mg/l (Report lbs/day)		Report (mg/l and lbs/day)		1/Month	Event Composite[4,5]
Parameter	**Total Monthly**	**Maximum Hourly**	**Duration**	**Frequency**	**Measurement Frequency**	**Sample Type**
Flow into the WWFTF[6]	Report (MG)	Report (MGD)	Report (Total Hours)	Report (# of Events)	Per Event[5]	Recorder
Flow discharged from the WWFTF to the chlorine contact tank[7]	Report (MG)	Report (MGD)	Report (Total # of Hours)	Report (# of Events)	Per Event[5]	Recorder
Flow drained back to the POTW[8]	Report (MG)	Report (MGD)	Report (Total of Hours)	Report (#of Events)	Per Event[5]	Recorder
Rainfall Precipitation[9]	See Footnote 9				Per Event[5]	Recorder

See Page 17 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. The Wet Weather Flow Treatment Facility shall maintain a minimum of 80 percent removal of total suspended solids (TSS). The percent removal shall be calculated as a monthly average using the influent and effluent TSS values.

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

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

7. 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.

8. 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.

9. 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.

Part I.B.5.

b. Screening and Disinfection Facility (SDF) (outfall number - To be determined) - Effluent Limitations and Monitoring Requirements[1]

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 (discharge outfall number to be determined[1]) 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[3]	Report (mg/l and lbs/day)	Report (mg/l and lbs/day)	1/Month	Event Composite[5]
TSS[3]	Report (mg/l and lbs/day)	Report (mg/l and lbs/day)	1/Month	Event Composite[5]
Total Residual Chlorine[6,8]	63.2 µg/l	109 µg/l	1 Event/Month[4]	Grab
	Wet Weather Event Maximum			
Escherichia coli[6,7]	1,000 colonies/100 mL		1 Event/Month[4]	Grab

See Page 17 for Footnotes

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

Effluent Characteristic	Effluent Limitation[1]				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. The permittee shall notify EPA and NHDES in writing 60 days prior to the commencement of operation of the SDF. This notification shall include the discharge outfall serial number. 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 the notification .

2. 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.

3. 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.

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

5. 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.

6. Samples collected for the analysis of *Escherichia coli (E. coli)* and total residual chlorine (TRC), as described in footnotes 7-8 below, shall be collected concurrently.

7. 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 (CFR) Part 136, List of Approved Biological Methods for Wastewater and Sewage Sludge.

8. Total residual chlorine shall be measured using any one of the following three methods listed in 40 CFR Part 136:

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

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

10. 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.

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

12. 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.

C. 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).

D. 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 D.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 D.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.

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.

E. 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 CFR § 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.

F. 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 CFR § 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 CFR §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 CFR §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 CFR. §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 CFR §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 CFR §403.18.

G. 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 CFR Part 503) requirements.

3. The requirements and technical standards of 40 CFR 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 CFR 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 CFR 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 CFR 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.

H. 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.

I. 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

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 6 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.G.)	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.D.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.D.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.D.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.F.)	Annually, by March 1st	Justin Pimpare Environmental Protection Agency P.O. Box 8127 Boston, Massachusetts 02114	
Pretreatment Program Update (Part I.F.)	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.I.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.H.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 di screpancies 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
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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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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)

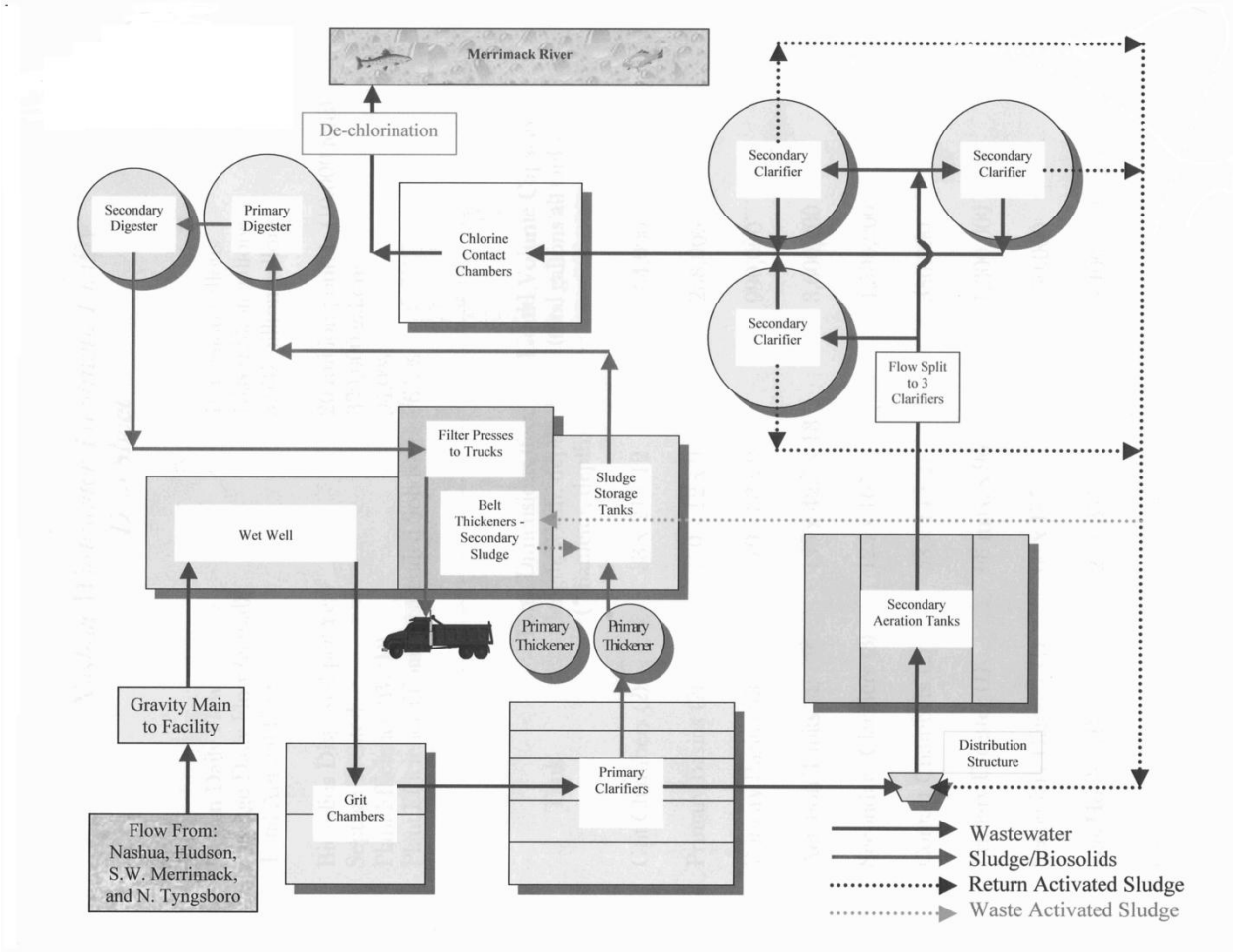

Figure 2 Nashua WWTF Process Flow Diagram

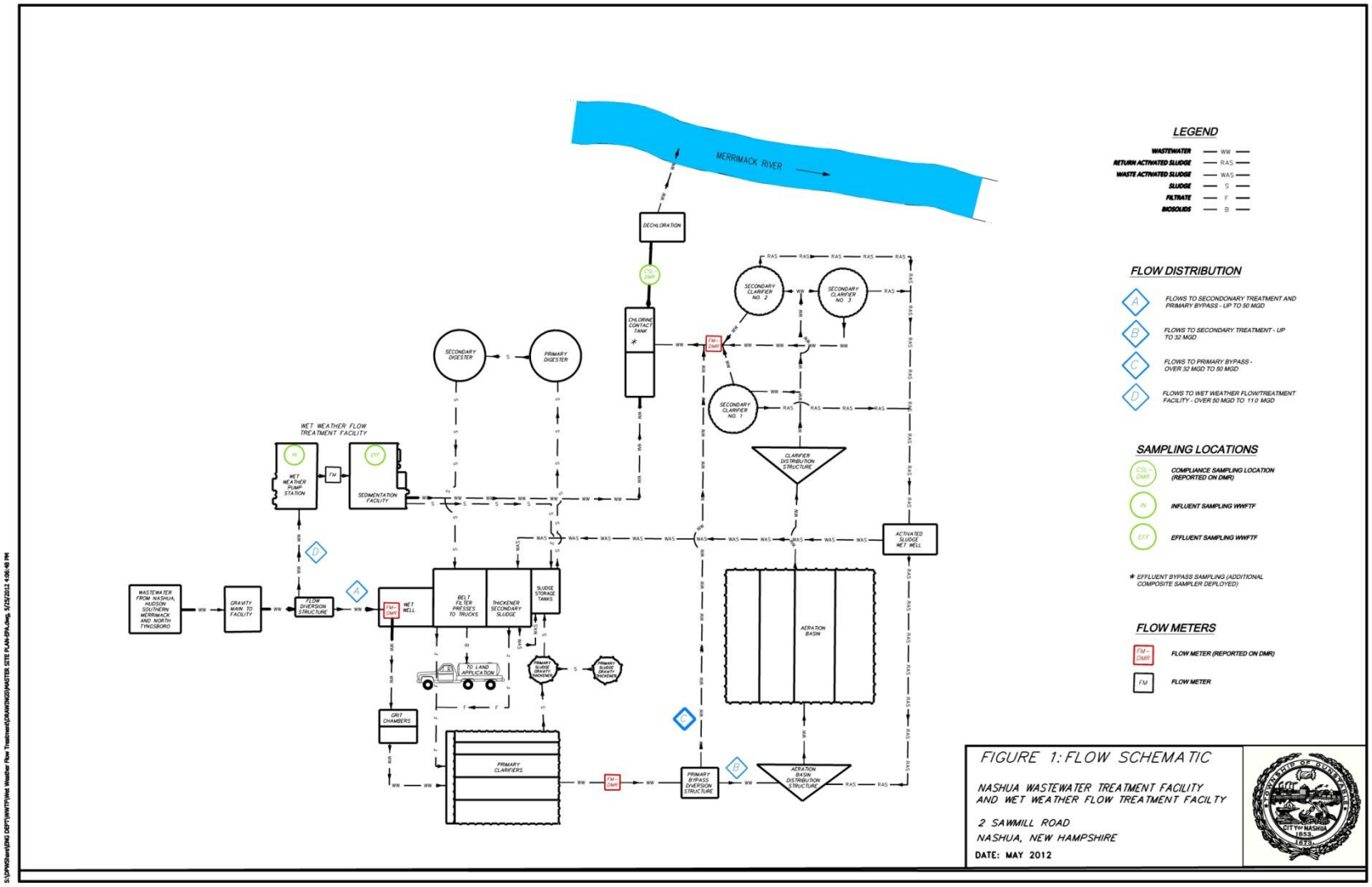

Figure 3 Wet Weather Flow Schematic

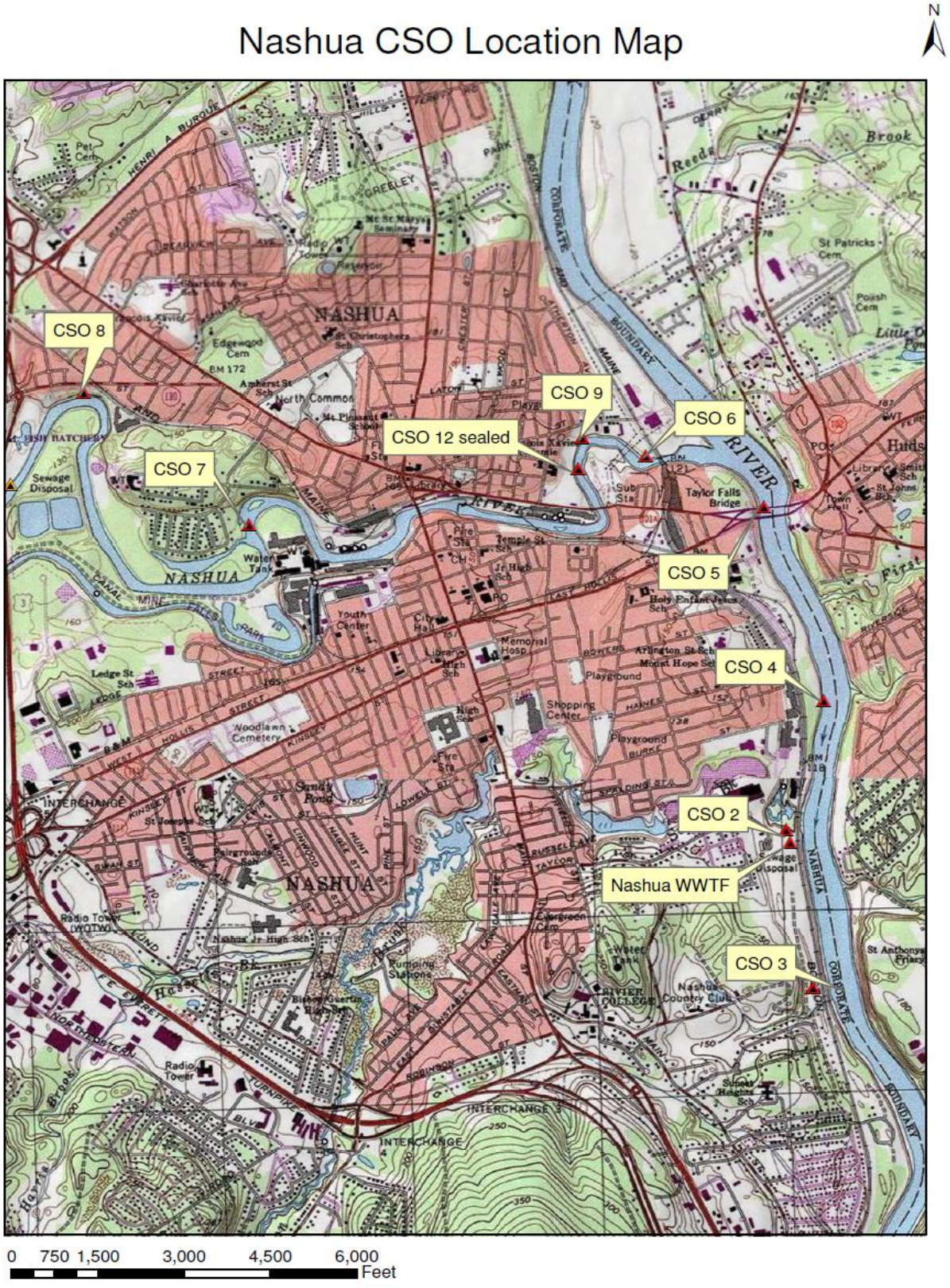

Figure 4 Nashua CSO Discharge Outfall Locations

Attachment A

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

Attachment B

Derivation of 7Q10 Flow and Dilution Factor

A dilution factor equal to 28.5 was used in the development of the draft permit. This dilution factor is based on a revised estimate of the 7Q10 flow at outfall 001, which was calculated by NHDES using the Dingman[1] equation. This equation estimates the flow in ungaged, unregulated streams based upon watershed (basin) area, mean basin elevation, and the percent of the basin underlain by coarse-grained stratified drift in contact with streams. The 7Q10 just downstream of the Nashua WWTP was estimated using U.S. Geological Survey (USGS) gaging station flow records. The Nashua WWTP is upstream of the USGS gaging station on the Merrimack River in Lowell, Massachusetts, and is downstream of the following three (3) stream gaging stations: Merrimack River near Goffs Falls below Manchester, New Hampshire; Souhegan River at Merrimack, New Hampshire; and Nashua River at East Pepperell, Massachusetts. Another gage is located on the Concord River at Lowell, Massachusetts, just upstream of the Merrimack River Lowell gage.

The 7Q10 flows at the USGS gaging station sites were calculated using Log-Pearson Type III statistics, based on gaging station records for years during which flow regulation was the same as is occurring today. The selected periods of record for each of the USGS gages, gage station identification numbers, and corresponding 7Q10 flow values, are listed below.

Gaging Station Name	Gage Id. No.	7Q10 (cfs)
Merrimack River in Lowell, MA (1943-2009)	01100000	870.986
Merrimack River near Goff's Falls below Manchester (1943-2006)	01092000	638.652
Souhegan River at Merrimack (1911-2006)	01094000	13.001
Nashua River at East Pepperell (1937-2006)	01096500	44.347
Concord River Below R Meadow Brook at Lowell (1962-2009)	01099500	33.8

The resulting upstream 7Q10 flow values were subtracted from the 7Q10 flow value at the Merrimack River Lowell gage to estimate the 7Q10 contribution from the intervening watershed area between the Merrimack River Lowell gage and the upstream gages. The resulting

[1] Dingman, S.L., and S.C. Lawlor, 1995. Estimating Low-Flow Quantiles from Drainage-Basin Characteristics in New Hampshire and Vermont, American Water Resources Association, Water Resources Bulletin, pp. 243-256. This empirical equation estimates 7Q10 stream flow in un-gaged, unregulated streams in New Hampshire and Vermont as a function of watershed characteristics. The formula variables are watershed (basin) area, mean basin elevation, and the percent of the basin underlain by coarse-grained stratified drift in contact with streams.

Attachment B (Continued)

"intervening area" 7Q10 estimated flow is 141.2 cfs (870.986 cfs - 638.652 cfs - 13.001 cfs - 44.347 cfs - 33.8 cfs = 141.2 cfs).

Next, the Dingman equation was used to estimate the proportion of the intervening area 7Q10 stream flow that is tributary to the Merrimack River upstream from the Nashua WWTF. This proportion is assumed to be equal to the ratio of the Dingman equation 7Q10 flow for the watershed area lying between the upstream gages and Nashua (20.03 cfs) to the Dingman equation 7Q10 flow for the watershed area lying between the upstream gages and the Merrimack River Lowell gage (32.12 cfs). The resulting ratio is 0.6237 (20.02 / 32.12).

Finally, the 7Q10 flow at the Nashua WWTP was calculated by multiplying the 7Q10 for the intervening watershed area between the upstream gages and the Merrimack River Lowell gage (141.2 cfs) by the ratio 0.6237, and then adding in all upstream gaged flows (Merrimack River at Goffs Falls, Souhegan River at Merrimack, and Nashua River at East Pepperell). The resulting 7Q10 stream flow is 784.1 cfs.

Dilution Factor

The following equation was used to calculate a dilution factor of 28.5.

$$\text{Dilution Factor} = \frac{Q_{001} \times 0.646}{Q_D} \times 0.9$$

Where:
Q_{001} = Estimated 7Q10 low flow of the Merrimack River just downstream of the Nashua WWTF (outfall 001) (784.1 cfs)
0.90 = Factor to reserve 10 % assimilative capacity
Q_D = Nashua WWTF's Design Flow (16 MGD)
0.646 = Factor to convert cfs to MGD.

Attachment C

Calculation of Mass-based Limits

Calculations of maximum allowable loads for average monthly BOD_5 and TSS are based on the following equation.

$$L = C \times QPDF \times 8.345$$

where:

L = Maximum allowable load, in lbs/day, rounded to nearest 1 lbs/day.
C = Maximum allowable effluent concentration for reporting period, in mg/L.
QPDF = Treatment plant's design flow, in mgd
8.345 = Factor to convert effluent concentration (mg/L) times design flow (mgd) to lbs/day

Attachment D

Data Summary (2007-2012)

Outfall 001

Monitoring Period End Date	BOD5						TSS					
	MO AVG		WKLY AVG		DAILY MX	MO AV MN	MO AVG		WKLY AVG		DAILY MX	MO AV MN
	4,006 lb/d	30 mg/L	6,008 lb/d	45 mg/L	50 mg/L	85%	4,006 lb/d	30 mg/L	6,008 lb/d	45 mg/L	50 mg/L	85%
03/31/2007	1356	14	1834	18	26	93	1047	10	1292	12	18	92.8
04/30/2007	1258	9	1958	11	16	92.9	1125	8	1641	10	15	92.2
05/31/2007	1103	10	1677	14	21	93.1	770	7	1268	11	22	95.2
06/30/2007	1157	11	1540	11	18	94.1	623	6	815	7	12	97
07/31/2007	1916	19	2205	21	28	90.2	496	5	576	6	9	97.4
08/31/2007	1406	15	2057	21	25	93	478	5	509	5	10	97.6
09/30/2007	953	12	1383	15	19	94.3	553	7	629	8	14	96.7
10/31/2007	1072	12	1187	14	22	94.8	498	6	689	7	12	97.5
11/30/2007	1390	15	1485	16	25	93.2	616	7	774	7	12	96.5
12/31/2007	693	8	1425	16	15	96.9	541	6	737	8	12	96.8
01/31/2008	775	7	1508	12	30	96.3	1012	9	2275	16	69	95.2
02/29/2008	2202	15	3348	23	34	87.9	4233	23	11863	55	210	81
03/31/2008	1617	10	2252	14	21	91.4	1402	8	2053	11	32	91.9
04/30/2008	1405	10	1213	10	41	93.2	1142	8	1463	9	27	93.8
05/31/2008	825	8	2497	15	14	95.3	489	5	1699	10	8	97.1
06/30/2008	1215	14	1346	17	26	92.4	627	7	974	11	51	96.6
07/31/2008	929	9	1935	15	20	94	566	6	1149	10	17	97.1
08/31/2008	980	9	1334	11	19	94.1	521	5	663	6	8	97.2
09/30/2008	1482	13	1791	15	27	91.3	786	7	1013	8	18	96
10/31/2008	1540	16	3174	30	95	91.5	1709	17	4166	38	191	91.4
11/30/2008	1076	14	1393	17	27	93.7	1702	14	2049	13	164	91.5
12/31/2008	1484	13	2123	19	42	91.9	1092	9	3937	29	55	94.1
01/31/2009	1097	11	1288	14	19	94.5	596	6	1003	11	16	96.2
02/28/2009	1126	12	1342	16	25	94.2	818	8	992	9	17	95.5
03/31/2009	767	7	931	7	10	96.1	845	8	1307	13	49	94.8
04/30/2009	959	8	1544	11	19	95.1	702	6	897	7	13	96.1
05/31/2009	808	8	1215	11	20	95.7	618	6	1051	8	11	96.6
06/30/2009	1129	12	1265	13	25	94.2	839	8	1007	9	17	95.8
07/31/2009	1419	12	2207	15	36	92.6	1334	12	1725	15	64	93.7
08/31/2009	1766	18	6398	56	86	91.7	2609	28	5667	60	161	88.7
09/30/2009	847	11	1491	18	22	94.6	381	5	540	7	10	97.7
10/31/2009	1298	17	1607	18	26	93.2	1162	13	3386	36	200	93.3
11/30/2009	1290	15	1536	16	22	93.3	649	7	818	10	17	96.4
12/31/2009	1485	17	1561	18	26	92.3	658	7	750	8	13	96
01/31/2010	1926	23	2435	29	48	89.2	510	6	905	9	14	96.7
02/28/2010	2170	22	3581	25	35	87.5	1163	11	2783	22	43	92.9
03/31/2010	2030	11	3478	16	22	89.8	1044	6	1784	8	13	94.1
04/30/2010	1773	13	2799	16	20	90.7	674	5	1332	6	8	95.7
05/31/2010	1634	17	2193	23	26	91.7	551	6	693	7	12	96.8

Attachment D (Continued)

Outfall 001

Monitoring Period End Date	BOD5						TSS					
	MO AVG		WKLY AVG		DAILY MX	MO AV MN	MO AVG		WKLY AVG		DAILY MX	MO AV MN
	4,006 lb/d	30 mg/L	6,008 lb/d	45 mg/L	50 mg/L	85%	4,006 lb/d	30 mg/L	6,008 lb/d	45 mg/L	50 mg/L	85%
06/30/2010	1075	13	1271	16	19	94.5	575	7	716	9	26	96.9
07/31/2010	1265	18	2224	32	53	92.1	601	9	849	12	20	96.5
08/31/2010	1272	19	1752	23	26	92.8	639	10	794	10	19	96.1
09/30/2010	2051	30	2833	38	48	88.6	813	12	1481	22	40	95.6
10/31/2010	2180	28	2859	34	44	87.8	697	9	866	11	17	95.2
11/30/2010	2672	35	3864	54	56	85.5	796	10	1322	18	27	94.8
12/31/2010	938	11	1441	20	28	95.3	698	8	1025	10	18	95.9
01/31/2011	775	11	789	11	16	95.8	779	11	845	12	18	95
02/28/2011	1173	13	1291	14	36	94	1190	13	1181	13	49	93.3
03/31/2011	2114	14	3891	22	38	88.8	1874	12	3273	18	30	87.9
04/30/2011	1224	11	1338	12	16	93.6	1244	11	1722	15	48	93.3
05/31/2011	1037	10	1377	13	22	94.4	729	7	952	9	20	95.8
06/30/2011	867	10	1121	11	21	95	783	8	1149	11	28	96.2
07/31/2011	910	12	1154	15	25	94.1	384	5	465	5	9	97.8
08/31/2011	1222	14	1385	15	28	93.6	1572	13	2623	19	51	93.1
09/30/2011	1645	16	2064	20	54	90.9	1988	19	3472	32	95	90
10/31/2011	1384	12	2398	23	26	91.4	1228	11	2667	25	42	92.4
11/30/2011	1223	11	1448	12	17	93.4	1138	10	1275	11	16	93.2
12/31/2011	1619	12	2664	15	30	92.2	1442	11	2616	15	37	91.5
01/31/2012	936	10	1135	13	15	94.6	824	9	1222	10	21	95
02/29/2012	622	7	880	9	18	96.5	502	6	858	8	21	97
03/31/2012	545	7	590	8	9	96.7	391	5	459	6	9	97.4
Min	545	7	590	7	9	85.5	381	5	459	5	8	81
Max	2672	35	6398	56	95	96.9	4233	28	11863	60	210	97.8
Avg.	1322.60	13.70	1972.90	18.57	29.32	92.84	994.95	9.24	1794.10	14.41	40.37	94.58
Median	1224	12	1544	16	25	93.2	779	8	1149	10	18	95.7

Attachment D (Continued)

Outfall 001

Monitoring Period End Date	Flow - Influent		Flow - Effluent		E. Coli		pH		TRC		Copper	
	MO AVG	DAILY MX	MO AVG	DAILY MX	MO GEO	DAILY MX	MIN	MAX	MO AVG	DAILY MX	MO AVG	DAILY MX
	MGD	MGD	MGD	MGD	126 #/100mL	406 #/100mL	6.5 SU	8 SU	0.308 mg/l	0.532 mg/l	Report mg/l	Report mg/l
03/31/2007	11.7	21.4	11.6	21.4	4	32	7.15	7.56	0.03	0.13	0.03	0.03
04/30/2007	18.7	44.5	16.1	30.6	2	28	6.86	7.41	0.05	0.28	0.02	0.02
05/31/2007	13.6	20.3	13.6	17.1	4	1414	6.93	7.41	0.05	0.17	0.02	0.02
06/30/2007	11.2	17.1	12.6	19.9	6	45	7.12	7.56	0	0.16	0.01	0.01
07/31/2007	10.7	17.8	11.9	15.1	10	325	6.84	7.53	0	0.17	0.01	0.01
08/31/2007	8.7	11.7	11.3	14	17	2419	7.29	7.67	0.02	0.19	0.01	0.01
09/30/2007	8.5	13.8	9.8	14.2	17	1046	7.11	7.65	0.02	0.08	0.01	0.01
10/31/2007	9	13.9	10.6	13.8	10	148	7.14	7.57	0.05	0.21	0.02	0.02
11/30/2007	9.4	15.6	11	15.7	11	93	7.14	7.62	0.06	0.3	0.02	0.02
12/31/2007	12	14.6	10.3	14.6	6	152	7.19	7.68	0	0.15	0.02	0.02
01/31/2008	10.6	23.6	11.9	20.7	6	2419	7	7.63	0.04	0.22	0.01	0.01
02/29/2008	17	32.3	17	32.3	10	1046	7.05	7.4	0.08	0.3	0.01	0.01
03/31/2008	19.9	31.4	20	31.4	2	66	6.92	7.33	0	0.19	0.01	0.01
04/30/2008	15.5	27.3	15.6	27.3	9	517	7.05	7.4	0	0.184	0.01	0.01
05/31/2008	12.1	16.5	12.1	16.5	2	54	7.07	7.53	0.05	0.27	0.01	0.01
06/30/2008	10.2	15.7	10.2	15.7	2	68	7.13	7.46	0	0.13	0.01	0.01
07/31/2008	11.1	19	11.1	19	3	22	7.03	7.54	0.08	0.34	0.03	0.03
08/31/2008	12.9	23.3	12.9	23.3	3	151	6.9	7.49	0.07	0.41	0.01	0.01
09/30/2008	13.4	26.9	13.4	26.3	3	63	6.76	7.56	0.13	0.52	0.011	0.012
10/31/2008	10.8	14.8	10.8	14.8	15	1732	7.06	7.47	0.14	0.47	0.01	0.01
11/30/2008	10	25.4	10	25.4	5	93	7.17	7.6	0.05	0.26	0.014	0.02
12/31/2008	13.6	22.5	13.6	22.5	5	79	6.75	7.43	0	0.27	0.01	0.01
01/31/2009	11.9	17.8	11.9	17.8	2	12	7.16	7.59	0	0.24	0.006	0.006
02/28/2009	11.7	16.7	11.7	16.7	2	88	6.93	7.65	0.06	0.39	0.012	0.013
03/31/2009	13.5	18.7	13.5	18.7	2	55	7.07	7.47	0.06	0.46	0.01	0.01
04/30/2009	13.9	22	13.9	22	1	14	7.08	7.4	0	0.31	0.01	0.01
05/31/2009	12.2	19.2	12.2	19.2	2	43	7.11	7.56	0	0.26	0.01	0.01
06/30/2009	11.8	18.6	11.8	18.6	4	87	7.12	7.52	0.04	0.48	0.01	0.01
07/31/2009	12.6	22.1	12.6	22.1	6	2419	7.07	7.48	0.04	0.22	0.01	0.01
08/31/2009	10.4	20.5	10.4	20.5	5	248	7.07	7.58	0.02	0.2	0.01	0.01
09/30/2009	8.9	18	8.9	18	4	61	6.59	7.5	0	0.34	0.01	0.01
10/31/2009	9.2	18.1	9.2	18.1	2	29	6.73	7.39	0.02	0.11	0.013	0.019
11/30/2009	9.8	23.3	9.8	23.3	3	73	6.52	7.08	0.06	0.28	0.01	0.01
12/31/2009	11	20.2	11	20.2	2	20	6.93	7.61	0.05	0.48	0.1	0.1
01/31/2010	10.5	25.4	10.5	25.4	1	6	7.18	7.68	0	0.29	0.011	0.013
02/28/2010	11.6	28.2	11.6	28.2	1	12	7.03	7.53	0.06	0.36	0.007	0.007
03/31/2010	21.1	42.8	21.1	42.8	2	166	6.83	7.74	0.06	0.46	0.01	0.01
04/30/2010	16.9	31.6	16.9	31.6	2	64	6.84	7.75	0.02	0.225	0.02	0.02
05/31/2010	11.5	16.1	11.5	16.1	1	6	6.59	7.48	0	0.12	0.02	0.029
06/30/2010	9.6	13.6	9.6	13.6	1	4	6.51	7.17	0	0	0.02	0.02

Attachment D (Continued)

Outfall 001

Monitoring Period End Date	Flow - Influent		Flow - Effluent		E. Coli		pH		TRC		Copper	
	MO AVG	DAILY MX	MO AVG	DAILY MX	MO GEO	DAILY MX	MIN	MAX	MO AVG	DAILY MX	MO AVG	DAILY MX
	MGD	MGD	MGD	MGD	126 #/100mL	406 #/100mL	6.5 SU	8 SU	0.308 mg/l	0.532 mg/l	Report mg/l	Report mg/l
07/31/2010	8.3	10.5	8.3	10.5	7	48	6.5	7.38	0	0.1	0.025	0.03
08/31/2010	8.1	17.4	8.1	17.4	13	122	6.65	7.29	0.07	0.34	0.015	0.02
09/30/2010	7.9	11.4	8.2	17.2	16	149	6.61	7.25	0.05	0.32	0.013	0.019
10/31/2010	9.1	17.2	9.1	17.2	10	1046	6.51	7.19	0	0.14	0.025	0.03
11/30/2010	9.4	19	9.3	16	3	25	6.76	7.26	0	0.42	0.02	0.02
12/31/2010	9.4	22.3	9.4	22.3	4	88	6.55	7.18	0.015	0.17	0.035	0.04
01/31/2011	8.5	10.9	8.5	10.9	2	6	6.73	7.16	0	0.42	0.015	0.02
02/28/2011	9.7	16	9.7	16	2	167	6.67	7.49	0.1	0.5	0.023	0.03
03/31/2011	16.5	23	16.5	23	2	1299	6.72	7.42	0.07	0.48	0.015	0.02
04/30/2011	13.8	19	13.8	19	3	133	6.91	7.8	0.03	0.38	0.014	0.02
05/31/2011	12.3	17.6	12.3	17.6	3	816	6.41	7.49	0.03	0.42	0.02	0.02
06/30/2011	10.8	20.1	10.8	20.1	3	20	6.52	7.67	0.03	0.32	0.015	0.02
07/31/2011	9.3	11.9	9.2	11.9	4	60	7.01	7.42	0	0.24	0.02	0.02
08/31/2011	11.3	29.2	11.3	29.2	7	228	6.7	7.4	0.08	0.52	0.022	0.025
09/30/2011	11.4	19.7	11.4	19.7	6	107	6.65	7.65	0	0.46	0.01	0.01
10/31/2011	12.9	22.5	12.9	22.5	4	44	6.59	7.37	0.06	0.51	0.015	0.02
11/30/2011	13.4	19.1	13.4	19.1	3	151	6.5	6.98	0	0.27	0.01	0.011
12/31/2011	13.8	34.5	13.8	34.5	2	186	6.51	7.43	0.06	0.3	0.01	0.01
01/31/2012	11.1	20.7	11.1	20.7	2.1	107.8	6.6	7.38	0.08	0.31	0.02	0.02
02/29/2012	10	17.1	10	17.1	2.2	104.1	6.72	7.31	0.02	0.07	0.019	0.02
03/31/2012	9.9	13.3	9.9	13.3	3	1986.3	6.77	7.31	0.037	0.319	0.01	0.01
Min	7.9	10.5	8.1	10.5	1	4	6.41	6.98	0	0	0.006	0.006
Max	21.1	44.5	21.1	42.8	17	2419	7.29	7.8	0.14	0.52	0.1	0.1
Avg	11.73	20.57	11.84	20.32	4.86	365.77	6.86	7.47	0.035	0.289	0.016	0.018
Median	11.2	19	11.4	19	3	88	6.9	7.48	0.03	0.28	0.012	0.013

Attachment D (Continued)

Outfall 001 – WET test and associated analytical results

Monitoring Period End Date	Al	Cd	Cr	Cu	Pb	Ni	Zn	Hardness	Ammonia-N	LC_{50} *C. dubia*	LC_{50} *P. promelas*
	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MN	DAILY MN
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100 %	100 %
03/31/2007	0.06	0.001	0.003	0.027	0	0.006	0.18	73	35	100	62
06/30/2007	0.02	0.001	0.002	0.017	0.005	0.003	0.063	57	33	100	90.6
09/30/2007	0	0	0	0.007	0	0.008	0.068	58	40	100	69.4
12/31/2007	0.026	0	0	0.015	0	0.007	0.087	58.6	36.3	84.2	49.6
03/31/2008	0	0	0	0.021	0	0.005	0.086	82	18	100	100
06/30/2008	0	0	0	0.017	0.00082	0.003	0.096	74	25	100	100
09/30/2008	0.03	0	0	0.012	0.001	0.005	0.048	69	20	100	100
12/31/2008	0.02	0	0.003	0.011	0	0	0	64	29	100	71.8
03/31/2009	0	0	0	0.011	0.001	0.002	0.063	76	21	100	100
06/30/2009	0.02	0	0	0.009	0.002	0.004	0.066	65	31	100	100
09/30/2009	0	0	0.003	0.01	0.001	0.006	0.051	60	13	100	100
12/31/2009	0.031	0	0	0.019	0.0012	0.004	0.052	48	16	100	100
03/31/2010	0	0	0	0.013	0.001	0.005	0.053	68	33	100	100
06/30/2010	0.047	0	0	0.029	0.002	0.007	0.079	59	18	100	100
09/30/2010	0.038	0	0.003	0.019	0.001	0.009	0.084	56	19	100	100
12/31/2010	0.04	0	0	0.024	0.001	0.006	0.096	57	13	100	100
03/31/2011	0.047	0	0.002	0.019	0.002	0.006	0.12	70	23	100	100
06/30/2011	0.029	0	0	0.01	0.001	0.004	0.06	68	22	100	100
09/30/2011	0.038	0.0005	0.002	0.025	0.001	0.005	0.072	66	8.7	100	100
12/31/2011	0.032	0	0	0.011	0.0006	0.004	0.057	66	11	100	100
03/31/2012	0.021	0	0	0.018	0.0009	0.004	0.087	64	23	100	100
Min	0	0	0	0.007	0	0	0	48	8.7	84.2	49.6
Max	0.06	0.001	0.003	0.029	0.005	0.009	0.18	82	40	100	100
Avg	0.0238	0.0001	0.0009	0.0164	0.0011	0.0049	0.0747	64.6952	23.24	99.25	92.54
Median	0.026	0	0	0.017	0.001	0.005	0.068	65	22	100	100

Results reported as not detected (“ND”) assigned a value = 0.

Attachment D (Continued)

Merrimack River – Upstream of Nashua WWTF

Monitoring Period End Date	Al	Cd	Cr	Cu	Pb	Ni	Zn	Hardness
	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
3/30/2007	0.095	0	0	0.002	0	0	0.02	20
6/30/2007								
9/30/2007	0	0	0	0	0	0	0.016	18
12/31/2007	0.14	0	0	0	0	0	0.0067	13.3
3/31/2008	0.038	NA	NA	0	0	0	0.02	14
6/30/2008	0.051	NA	NA	0	0	0	0.052	17
9/30/2008	0.15	0	0	0	0.001	0	0.011	14
12/31/2008	0.07	0	NA	0.002	0	0	0.019	17
3/31/2009	0.14	0	NA	0.003	0.0007	0	0.015	13
6/30/2009	0.11	0	0	0.002	0.0006	0	0.017	14
9/30/2009	0.06	0	0	0.003	0	0	0.009	15
12/31/2009	0.075	0	0	0.006	0.0008	0	0.005	14
3/31/2010	0	0	0	0.006	0.0005	0	0.009	15
6/30/2010	0.082	0	0	0.011	0.0007	0	0.006	15
9/30/2010	0.043	0	0	0.003	0.0005	0	0.004	18
12/31/2010	0.49	0	0	0.004	0.001	0	0.008	8.8
3/31/2011	0.082	0	0	0	0	0	0.005	17
06/30/2011	0.4	0	0	0	0.0008	0	0.004	8.3
09/30/2011	0							
12/31/2011	0.085	0	0	0	0	0	0.004	13
03/31/2012	0.08	0	0	0	0.0005	0	0.004	14
Min	0	0	0	0	0	0	0.004	8.3
Max	0.49	0	0	0.011	0.001	0	0.052	20
Avg	0.10955	0	0	0.002	0.0004	0	0.0124	14.65
Median	0.081	0	0	0.002	0.0005	0	0.009	14

Values reported as not detected ("ND") assigned a value = 0.

Attachment E Bypass Events[1] (2007-2012)

Monitoring Period End Date	Flow	Bypass		*E. Coli*	TRC	pH		BOD5			BOD5		TSS			TSS	
	DAILY MX	DAILY MX	MO Total	DAILY MX	DAILY MX	MIN	MAX	MO AVG	WKLY AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	WKLY AVG	DAILY MX	MO AVG	DAILY MX
	MGD	hrs/day	# days/month	406 #/100mL	0.31 mg/l	SU	SU	mg/l	mg/l	mg/l	lbs/day	lbs/day	mg/l	mg/l	mg/l	lbs/day	lbs/day
03/31/2007	1.5	4	1		0.31	6.93	6.93	65	65	65	786	786	82	82	82	992	992
04/30/2007	11.6			4	0.28	6.54	6.89	34	48	48	1786	2709	39	46	46	2163	3193
11/30/2007	**0.42**	**2.5**	**1**		**0**	**6.97**	6.97	54	54	54	189	189	41	41	41	144	144
02/29/2008	0.9	11.7	1	40	0.260	6.85	6.85	75	75	75	550	550	159	159	159	1167	1167
03/31/2008	13.1	93	5	66	0.210	6.72	7.2	50	50	54	2979	5877	55	57	62	3296	6748
07/31/2008	4.9	4	2	7	0.290	6.68	6.86	25	20	30	822	826	22	20	24	739	817
08/31/2008	5	6.3	3		0.000	6.72	6.91	29	31	33	708	1170	22	24	27	525	836
09/30/2008	11.4	9.5	4	79	0.330	6.82	7.18	36	38	38	1695	1944	29	32	36	1580	1629
11/30/2008	15.3	12	1	52	0.270	7.16	7.16	47	47	47	5997	5997	20	20	20	2552	2552
12/31/2008	9.8	6.5	2	1	0.220	7.09	7.81	34	34	34	2768	2768	43	43	46	1920	3256
04/30/2009	11	6.1	5	4	0.300	6.94	7.81	45	35	68	3137	6068	55	51	66	3754	5890
05/31/2009	4.4	3.8	3	18	0.000	6.95	7.15	46	46	46	1458	1458	54	54	61	1458	2238
06/30/2009	10.3	6	3	1	0.280	6.83	6.98	39	39	52	2692	3166	48	48	50	3419	4037
07/31/2009	5.7	5.5	2	49	0.150	7.06	7.17	42	53	53	1428	2511	55	59	59	1685	2795
08/31/2009	6.5	11	3	157	0.160	6.58	7.03	72	72	96	3770	5180	90	96	138	3578	7446
10/31/2009	8	10	1	9	0.300	7	7	48	48	48	3203	3203	50	50	50	3336	3336
11/30/2009	0.6	2	1	29	0.000	6.84	6.84	24	24	24	128	128	26	26	26	139	139
12/31/2009	4.1	2.5	1	16	0.140	7.06	7.06	32	32	32	1094	1094	47	47	47	1607	1607
01/31/2010	15.7	7.8	1		0.000	7.18	7.18	58	58	58	7594	7594	86	86	86	11261	11261
02/28/2010	21.2	12	2	1	0.310	7.09	7.12	49	49	64	7501	11316	79	79	128	13492	22631
03/31/2010	14	24	7	43	0.000	6.54	7.27	47	52	56	2264	3736	38	48	46	1935	3269
06/30/2010	1.22	2.3	1		0.000	6.63	6.63	78	78	78	794	794	72	72	72	733	733
08/31/2010	9.6	5	1	41	0.000	6.69	6.69	40	40	40	3203	3203	40	40	40	3203	3203
10/31/2010	9.9	5.4	2		0.010	6.81	6.81	31	32	32	1734	2642	36	38	38	1927	2807

[1]Monitoring results of wet weather related bypasses are reported pursuant to a 2005 Consent Decree (*United States v. City of Nashua, NH,* Civil Action No. 05-376-PB (December 2005)). No bypasses occurred/data reported during the following monitoring periods: 05/2007-10-2007; 12/2007-01/2008; 04/2008-06/2008; 10/2008; 01/2009-03/2009; 09/2009; 04/2010-05/2010; 07/2010; 09/2010; 11/2010-05/2011; 09/2011-10/2011; 01/2012; 03/2012.

Attachment E (Continued)

Monitoring Period End Date	Flow	Bypass		*E. Coli*	TRC	pH		BOD5			BOD5		TSS			TSS	
	DAILY MX	DAILY MX	MO Total	DAILY MX	DAILY MX	MIN	MAX	MO AVG	WKLY AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	WKLY AVG	DAILY MX	MO AVG	DAILY MX
	MGD	hrs/day	# days/month	406 #/100mL	0.31 mg/l	SU	SU	mg/l	mg/l	mg/l	lbs/day	lbs/day	mg/l	mg/l	mg/l	lbs/day	lbs/day
06/30/2011	6.3	3.5	1	62	0.290	6.56	6.56	21	21	21	1103	1103	16	16	16	841	841
07/31/2011	5.2	2.6	1	3	0.060	6.96	6.96	25	25	25	1076	1076	8	8	8	344	344
08/31/2011	12	16	2	145	0.000	6.59	6.71	59	78	78	5338	7806	56	61	61	4846	6105
11/30/2011	9.7	6	3		0.150	6.62	6.7	52	54	54	2428	4368	51	49	56	2332	3964
12/31/2011	6.3	11	2		0.240	6.64	6.78	45	58	58	2278	3023	33	40	40	1572	2085
02/29/2012	8.39	4.1	1		0.000	6.79	6.79	62	62	62	4338	4338	80	80	80	5598	5598
Min	0.42	2	1	1	0	6.54	6.56	21	20	21	128	128	8	8	8	139	139
Max	21.2	93	7	157	0.33	7.18	7.81	78	78	96	7594	11316	159	159	159	13492	22631
Avg	8.13	10.21	2.17	39.38	0.152	6.828	7	45.47	47.27	50.77	2494.70	3220.77	51.07	52.4	57.03	2737.93	3722.1
Median	8.195	6	2	29	0.155	6.825	6.965	45.5	48	52.5	2025	2738.5	47.5	48	48.5	1923.5	2801

[1]Monitoring results of wet weather related bypasses are reported pursuant to a 2005 Consent Decree (*United States v. City of Nashua, NH*, Civil Action No. 05-376-PB (December 2005)). No bypasses occurred/data reported during the following monitoring periods: 05/2007-10-2007; 12/2007-01/2008; 04/2008-06/2008; 10/2008; 01/2009-03/2009; 09/2009; 04/2010-05/2010; 07/2010; 09/2010; 11/2010-05/2011; 09/2011-10/2011; 01/2012; 03/2012.

Attachment F

Combined Sewer Overflow Data

Annual Overflow Volumes (2009-2011)

			Annual Overflow Volume(MG)		
CSO Outfall No.	**Location**	**Receiving Stream**	**2009**	**2010**	**2011**
002	Salmon Brook	Merrimack River	0	0	0
003	Farmington Road	Merrimack River	7.14	0	0
004	Burke Street	Merrimack River	3.634	2.364	9.427
005	East Hollis Street	Merrimack River	159.51	65.903	29.631
006	Nashua River	Nashua River	48.9	22.646	46.065
007	Tampa Street	Nashua River	0.33	0	1.139
008	Broad Street	Nashua River	1.8	0	0
009	Lock Street	Nashua River	1.291	0.187	0.466
		Total	**222.605**	**91.1**	**86.728**

CSO Bacteria Data (2007-2011)

CSO #	**002**	**003**	**004**	**005**	**006**	**007**	**008**
Monitoring Period End Date	***E. Coli***	***E. Coli***	***E. Coli***	***E. Coli***	***E. Coli***	***E. Coli***	***E. Coli***
	DAILY MX	**DAILY MX**	**DAILY MX**	**DAILY MX**	**DAILY MX**	**DAILY MX**	**DAILY MX**
	406 #/100mL	**406 #/100mL**	**406 #/100mL**	**406 #/100mL**	**406 #/100mL**	**406 #/100mL**	**406 #/100mL**
12/31/2007		1600	100	8000			8000
12/31/2008		2419	2419	2419			
12/31/2009				2419			
12/31/2010				1119			
12/31/2011							

Attachment G

Statistical Approach to Characterizing the Effluent for Determining Reasonable Potential

EPA bases its determination of "reasonable potential" on a characterization of the upper bound of expected effluent concentrations based on a statistical analysis of the available monitoring data. As noted in the *Technical Support Document for Water Quality Based Toxics Control* (EPA 1991) ("TSD"), "[a]ll monitoring data, including results for concentrations of individual chemicals, have some degree of uncertainty associated with them. The more limited the amount of test data available, the larger the uncertainty." Thus with a limited data set, the maximum concentration that has been found in the samples may not reflect the full range of effluent concentration.

To account for this, EPA has developed a statistical approach to characterizing effluent variability when the monitoring dataset includes 10 or more samples.[2] As "experience has shown that daily pollutant discharges are generally lognormally distributed," *TSD* at App. E, EPA uses a lognormal distribution to model the shape of the observed data, unless analysis indicates a different distributional model provides a better fit to the data. The model parameters (mean and variance) are derived from the monitoring data. The model parameter μ is the mean of the natural logs of the monitoring data values, while σ is the standard deviation of the natural logs of the monitoring data values.

The lognormal distribution generally provides a good fit to environmental data because it is bounded on the lower end (i.e. you cannot have pollutant concentrations less than zero) and is positively skewed. It also has the practical benefit that if an original lognormal data set X is logarithmically transformed (i.e. Y = ln[X]) the resulting variable Y will be normally distributed. Then the upper percentile expected values of X can be calculated using the z-score of the standardized normal distribution (i.e. the normal distribution with mean = 0 and variance = 1), a common and relatively simple statistical calculation. The p^{th} percentile of X is estimated by

$$X_p = \exp(\mu_y + z_p \times \sigma_y),$$

where μ_y = mean of Y
σ_y = standard deviation of Y
Y = ln[X]
z_p = the z-score for percentile "p"

For the 95^{th} percentile, $z_{95} = 1.645$, so that

$$X_{95} = \exp(\mu_y + 1.645 \times \sigma_y)$$

The 95th percentile value is used to determine whether a discharge has a reasonable potential to cause or contribute to an exceedance of a water quality standard. The combination of the upper bound effluent concentration with dilution in the receiving water is calculated to determine whether the water quality criteria will be exceeded.

Datasets including non-detect values

[2] A different statistical approach is applied where the monitoring data set includes less than 10 samples.

Attachment G (Continued)

The *TSD* also includes a procedure for determine such percentiles when the dataset includes non-detect results, based on a delta-lognormal distribution. In the delta-lognormal procedures, nondetect values are weighted in proportion to their occurrence in the data. The values above the detection limit are assumed to be lognormally distributed values.

The statistical derivation of the delta-lognormal upper bounds is quite complex and is set forth in the TSD at Appendix E. Calculation of the 95th percentile of the distribution, however, involves a relatively straightforward adjustment of the equations given above for the lognormal distribution, as follows.

For the deltalognormal, the pth percentile of X, referred to here as X_p*, is given by

$$X_p^* = \exp(\mu_y^* + z_p^* \times \sigma_y^*),$$

where μ^*= mean of Y values for data points above the detection limit;
σ_y^*= standard deviation of Y for data points above the detection limit;
$Y = \ln[X^*]$;
X^*= monitoring data above detection limit; and
z_p^* = an adjusted z score that is given by the equation:

$$z_p^* = \text{z-score}[(p - \delta)/(1 - \delta)]$$

where δ is the proportion of nondetects in the monitoring dataset.

k = total number of dataset
r = number of nondetect values in the dataset
$\delta = r/k$

Attachment G (Continued)

For the 95th percentile, this takes the form of z_p^* = z-score[(.95 – δ)/(1 - δ)]. The resulting values of z_p^* for various values of δ is set forth in the table below; the calculation is easily performed in excel or other spreadsheet programs.

Example calculations of z_p^* for 95th percentile

δ	**(0.95 - δ)/ (1 - δ)**	**z_p^***
0	0.95	1.645
0.1	0.94	1.593
0.3	0.93	1.465
0.5	0.90	1.282
0.7	0.83	0.967

Attachment H

Example Calculation of Reasonable Potential Determination

The following is an example of the methodology used for determining reasonable potential, using copper and the relevant chronic water quality criterion.

The downstream concentration (Cr) of copper that is expected to occur as a result of the discharge is calculated as follows:

$$C_r = \frac{Q_d C_d + Q_S C_S}{Q_r}$$

where:

Q_d = effluent flow (design flow = 16 mgd = 24.75 cfs)
C_d = effluent metals concentration in µg/L (95^{th} percentile = 32.42 µg/l)
Q_S = stream flow upstream (7Q10 upstream = 759.4 cfs)
C_S = background (ambient) in-stream metals concentration in µg/L (median = 2 g/l)
Q_r = resultant in-stream flow, after discharge ($Q_S + Q_d$ = 784.1 cfs)
C_r = resultant downstream concentration, in ug/L

Following the methodology set forth in Box 3-2 and Attachment E of the *Technical Support Document for Water Quality-based Toxics Control* (US EPA, March 1991 [505/2-90-001]), the 95^{th} percentile estimated effluent daily maximum concentration (C_d) was determined from a statistical analysis of aluminum data submitted with WET test reports from 2007-2012 (see **Attachment A** and Table 6). Values reported as being either not detected or below the detection limit were assigned a value of 0.

Applying this maximum effluent concentration to the mass balance equation results in a projected downstream concentration of 2.96 ug/l, as shown below.

C_r = [(27.75 cfs)(32.42 ug/l) + (759.4 cfs)(2 ug/l)] / 784.1 cfs = **2.96 ug/l**

Reasonable potential is then determined by comparing this resultant downstream concentration with the relevant criterion multiplied by a factor of 0.9 to reserve 10% of the assimilative capacity of the receiving water, in accordance with Env-Wq 1705.01. In this case, the chronic criterion (87 ug/l) multiplied by 0.9 results in a value equal to 78.3 ug/l. Since 79.09 ug/l is greater than 78.3 ug/l, there is reasonable potential for the discharge to cause or contribute to

Attachment H (Continued)

exceedances of the chronic criterion. Therefore, a chronic effluent limitation is necessary to ensure attainment of water quality standards.

A chronic effluent limitation was determined by rearranging the mass balance equation to solve for the maximum concentration of aluminum that may be present in the effluent (C_d) without resulting in the downstream criterion being exceeded, as follows:

$$C_d = \frac{Q_r C_r - Q_S C_S}{Q_d}$$

The terms would be the same as those described above with the exception of the resultant in-stream concentration (C_r) being replaced with the relevant criterion multiplied by 0.9 (2.85 ug/l * 0.9 = 2.57 ug/l).

C_d = [(784.1)(2.57 ug/l) - (759.4 cfs)(2 ug/l)]/24.75 cfs = **20.0 ug/l**

Therefore, a chronic effluent limit of 20.0 ug/l has been included in the draft permit.

Attachment I

Screening and Disinfection Facility-Dilution Factor and Total Residual Chlorine Limitation Calculations

According to information submitted to EPA and NHDES, the screening and disinfection facility (SDF) is designed to treat flows up to 141 cfs (91 MGD). A dilution factor of 5 was derived from the design flow of the facility and the 7Q10 stream flow that was established for the Merrimack River upstream from the Nashua WWTF (784.1 cfs) (see AttachmentB).

Limitations for total residual chlorine were calculated by multiplying the dilution factor by the acute and chronic criteria. These calculations are shown below.

Dilution Factor

The following equation was used to calculate a dilution factor of 5:

$$\text{Dilution Factor} = \frac{Q_{MR} + Q_D}{Q_D} \times 0.9$$

Where:
Q_{MR} = Estimated 7Q10 low flow of the Merrimack River (759.4 cfs)
0.90 = Factor to reserve 10 % assimilative capacity
Q_{SDF} = Design Flow of the SDF (141 cfs)

Dilution Factor = (759.4 cfs +141 cfs/ 141 cfs)X 0.9 = 5.747

Total Residual Chlorine Limitations

Acute criterion = 19 µg/l
Chronic criterion = 11 µg/l

Limit = criteria x dilution factor

Acute Limit = 19 µg/l X 5.747 = 109 µg/l = 0.109 mg/l

Chronic Limit = 11 µg/l X 5.747 = 63.2 µg/l = 0.063 mg/l

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
WATER DIVISION
P.O. BOX 95
CONCORD, NEW HAMPSHIRE 03302-0095

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ECOSYSTEM PROTECTION
REGION I
BOSTON, MASSACHUSETTS 022030001

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO THE WATERS OF THE UNITED STATES UNDER SECTIONS 301 AND 402 OF THE CLEAN WATER ACT (THE "ACT"), AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE ACT, AND ISSUANCE OF A STATE SURFACE WATER PERMIT UNDER NH RSA 485-A:13, I(a).

DATE OF NOTICE: **July 23, 2013**

PERMIT NUMBER: **NH0100170**

PUBLIC NOTICE NUMBER: **NH-005-13**

NAME AND MAILING ADDRESS OF APPLICANT:

City of Nashua
Sawmill Road
Nashua, New Hampshire 03060

NAME AND LOCATION OF FACILITY WHERE DISCHARGE OCCURS:

Nashua Wastewater Treatment Facility
Sawmill Road
Nashua, New Hampshire 03060

RECEIVING WATER(S): Merrimack River and Nashua River

RECEIVING WATER(S) CLASSIFICATION(S): Class B

PREPARATION OF THE DRAFT PERMIT:

The U.S. Environmental Protection Agency (EPA) and the New Hampshire Department of Environmental Services, Water Division have cooperated in the development of a draft permit for the above identified facility. The effluent limits and permit conditions imposed have been drafted to assure that State Water Quality Standards and provisions of the Clean Water Act will be met. EPA has formally requested that the State certify the draft permit pursuant to Section 401 of the Clean Water Act and expects that the draft permit will be certified. However, sludge conditions in the draft permit are not subject to State certification requirements.

INFORMATION ABOUT THE DRAFT PERMIT:

A fact sheet (describing the type of facility; type and quantities of wastes; a brief summary of the basis for the draft permit conditions; and significant factual, legal and policy questions considered in preparing this draft permit) and the draft permit may be obtained at no cost at http://www.epa.gov/region1/npdes/draft_permits_listing_nh.html or by writing or calling EPA's contact person named below:

Meridith Timony
U.S. Environmental Protection Agency – Region 1
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109-3912
Telephone: (617) 918-1533

The administrative record containing all documents relating to the draft permit is on file and may be inspected at the EPA Boston office mentioned above between 9:00 a.m. and 5:00 p.m., Monday through Friday, except holidays.

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

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 **September 20, 2013,** to the U.S. EPA, 5 Post Office Square, Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing to EPA and the State Agency for a public hearing to consider the draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty 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 EPA's Boston office.

FINAL PERMIT DECISION:

Following the close of the comment period, and after a public hearing, if such hearing is held, 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.

HARRY T. STEWART, P.E., DIRECTOR
WATER DIVISION
NEW HAMPSHIRE DEPARTMENT OF
ENVIRONMENTAL SERVICES

KEN MORAFF, ACTING DIRECTOR
OFFICE OF ECOSYSTEM PROTECTION
U.S. ENVIRONMENTAL PROTECTION
AGENCY - REGION I