

**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§ 26-53),

Town of Sturbridge

is authorized to discharge from the facility located at

**Sturbridge Water Pollution Control Facility
1 New Boston Road Extension
Sturbridge, Massachusetts 01566**

to receiving water named

Quinebaug River (MA41-02)

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

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

This permit and the authorization to discharge expire at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on September 28, 2006.

This permit consists of 18 pages in Part I including effluent limitations and monitoring requirements; Attachment A, USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol (March 2013, 7 pages), Attachment A-1, USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol (February 28, 2011, 8 pages) and 25 pages in Part II including General Conditions and Definitions.

Signed this 11th day of September, 2014

/S/SIGNATURE ON FILE

Ken Moraff, Director
Office of Ecosystem Protection Program
Environmental Protection Agency
Boston, MA

/S/SIGNATURE ON FILE

David Ferris, Director
Massachusetts Wastewater Management
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Quinebaug River. Such discharge shall be limited and monitored as specified below.						
<u>Effluent Characteristic</u>		<u>Effluent Limits</u>			<u>Monitoring Requirements</u>	
<u>Parameter</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average Weekly</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u>	<u>Sample Type³</u>
Flow ²	MGD	1.30	----	Report	Continuous	Recorder
Flow ²	MGD	Report	----	Report	Continuous	Recorder
CBOD ₅ ⁴	mg/l	6	6	9	3/Week	24-Hour Composite ⁵
(April 1 – September 30)	lbs/day	63	63	94	3/Week	24-Hour Composite ⁵
BOD ₅ ⁴	mg/l	12	12	17	2/Week	24-Hour Composite ⁵
(October 1 - March 31)	lbs/day	125	125	188	2/Week	24-Hour Composite ⁵
TSS ⁴	mg/l	6	6	9	3/Week	24-Hour Composite ⁵
(April 1 – September 30)	lbs/day	63	63	94	3/Week	24-Hour Composite ⁵
TSS ⁴	mg/l	12	12	17	3/Week	24-Hour Composite ⁵
(October 1 - March 31)	lbs/day	125	125	188	3/Week	24-Hour Composite ⁵
pH Range	SU	6.5-8.3 S.U. (See PERMIT PARAGRAPH I.A.1.b)			1/Day	Grab
Dissolved Oxygen (April 1 – October 31)	mg/l	NOT LESS THAN 6.0 mg/l			1/Day	Grab
Fecal Coliform ^{1,6} (April 1- October 31)	cfu/100 ml	200	----	400	2/Week	Grab
Escherichia Coli Bacteria, (<i>E. coli</i>) ^{1,6} (April 1 through October 31)	cfu/100 ml	126	----	409	2/Week	Grab
Copper, Total ⁷	ug/l	14	****	20	1/Month	24-Hour Composite ⁵

Sampling Location: *Prior to UV disinfection for all parementers, except E. coli, which shall be sampled after the UV system.*

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<u>Effluent Characteristic</u>		<u>Effluent Limits</u>			<u>Monitoring Requirements</u>	
<u>Parameter</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average Weekly</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u>	<u>Sample Type³</u>
Aluminum, Total	mg/l lbs/day	0.250 2.71	***** *****	0.646 7.00	1/Month 1/Month	24-Hour Composite ⁵ 24-Hour Composite ⁵
Zinc, Total	mg/l lbs/day	***** *****	***** *****	0.0469 0.5087	1/Month 1/Month	24-Hour Composite ⁵ 24-Hour Composite ⁵
Phosphorus, Total (April 1 - October 31)	mg/l lbs/day	0.12 1.25	***** *****	***** *****	2/Week 2/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
Phosphorus, Total (November 1- March 31)	mg/l lbs/day	1.0 10.84	***** *****	***** *****	2/Week 2/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
Ortho Phosphorus, Dissolved (November 1-March 31)	mg/l lbs/day	Report Report	***** *****	Report Report	2/Week 2/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
Ammonia Nitrogen ⁸ (June 1-October 31)	mg/l lbs/day	0.87 9.4	***** *****	1.2 12.5	1/Week 1/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
Ammonia Nitrogen ⁸ (November 1 - May 31)	mg/l	Report	*****	Report	1/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
Total Kjeldahl Nitrogen ⁸	mg/l	Report	*****	Report	1/Week	24-Hour Composite ⁵
Total Nitrate ⁸	mg/l	Report	*****	Report	1/Week	24-Hour Composite ⁵
Total Nitrite ⁸	mg/l	Report	*****	Report	1/Week	24-Hour Composite ⁵
Total Nitrogen ⁸	mg/l	Report	*****	Report	1/Week	24-Hour Composite ⁵
Whole Effluent Toxicity ^{9,10,11,12}		Acute LC ₅₀ ≥ 100% Chronic C-NOEC ≥ 23%			4/Year	24-Hour Composite ⁵ 24-Hour Composite ⁵
Hardness ¹³		Report mg/l			4/Year	24-Hour Composite ⁵
Ammonia Nitrogen as N ¹³		Report mg/l			4/Year	24-Hour Composite ⁵
Total Recoverable Aluminum ¹³		Report mg/l			4/Year	24-Hour Composite ⁵
Total Recoverable Cadmium ¹³		Report mg/l			4/Year	24-Hour Composite ⁵

Sampling Location: *Prior to UV disinfection for all parenters, except E. coli, which shall be sampled after the UV system.*

Total Recoverable Chromium ¹³	Report mg/l	4/Year	24-Hour Composite ⁵
Total Recoverable Copper ¹³	Report mg/l	4/Year	24-Hour Composite ⁵
Total Recoverable Nickel ¹³	Report mg/l	4/Year	24-Hour Composite ⁵
Total Recoverable Lead ¹³	Report mg/l	4/Year	24-Hour Composite ⁵
Total Recoverable Zinc ¹³	Report mg/l	4/Year	24-Hour Composite ⁵

Sampling Location: *Prior to UV disinfection for all parenters, except E. coli, which shall be sampled after the UV system.*

Footnotes:

1. Required for State Certification.
2. Report annual average, monthly average, and the maximum daily flow discharged to the Quinebaug River. The limit is an annual average, which shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months.
3. Effluent sampling shall be of the discharge and shall be collected at outfall 001. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report.

All samples shall be tested using the analytical methods found in 40 CFR § 136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR § 136.

4. Sampling required for influent and effluent.
5. 24-hour composite samples will consist of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow.
6. Fecal coliform bacteria discharges shall not exceed a monthly geometric mean of 200 colony forming units (cfu) per 100 ml, nor shall they exceed 400 cfu per 100 ml as a daily maximum. The monthly average limit for *E. coli* is expressed as a geometric mean and *E. coli* discharges shall not exceed a monthly geometric mean of 126 cfu per 100 ml, nor shall they exceed 409 cfu per 100 ml as a daily maximum.

The fecal coliform bacteria limits and monitoring requirements are in effect only for the duration of the first seasonal monitoring period of April 1 through October 31 following the effective date of the permit. For example, if the permit becomes effective on October 1, 2014, the fecal coliform limits and monitoring requirements will be in effect April through October 2015.

The *E. coli* monitoring requirements are in effect upon the effective date of the permit. The *limits* become effective on the April 1 following the end of the period in which the fecal coliform limits are effective. For example, if the permit becomes effective on October 1, 2014, the permittee shall monitor *E. coli* beginning in October 1, 2014, but the *limits* will not become effective until April 1, 2016. The monitoring frequency for *E. coli* before the limits go into effect is 1/month. After the *limits* are in effect, the monitoring frequency is 2/week.

7. The minimum level (ML) for copper is defined as 3 ug/l. This value is the minimum level for copper using the Furnace Atomic Absorption analytical method (EPA Method 220.2). This method or other EPA-approved method with an equivalent or lower ML shall be used for effluent

limitations less than 3 ug/l. Compliance/non-compliance will be determined based on the ML. Sampling results of 3 ug/l or less shall be reported as zero on the Discharge Monitoring Report.

8. See Part 1.F. for requirements to evaluate and implement optimization of nitrogen removal.
9. The permittee shall conduct chronic and acute toxicity tests *four* times per year. The permittee shall test the daphnid, *Ceriodaphnia dubia* and the fathead minnow, *Pimephales promelas*.

Toxicity test samples shall be collected during the second week of the months of February, May, August and November. The test results shall be submitted by the last day of the month following the completion of the test. The results are due March 31, June 30, September 30 and December 31, respectively. The tests must be performed in accordance with test procedures and protocols specified in Attachment A, Freshwater Chronic Toxicity Test Procedure and Protocol (March 2013, 7 pages) of this permit and Attachment A-1, Freshwater Acute Toxicity Test Procedure and Protocol (February 28, 2011, 8 pages).

Test Dates Second Week in	Submit Results By:	Test Species	Acute Limit LC ₅₀	Chronic Limit C-NOEC
February May August November	March 31 June 30 September 30 December 31	<u>Pimephales promelas</u> (fathead minnow) and <u>Ceriodaphnia dubia</u> (daphnid)	≥ 100%	≥ 23%

After submitting **one year** and a **minimum** of four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed.

10. The LC₅₀ 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.
11. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction, based on a statistically significant difference from dilution control, at a specific time of observation as determined from hypothesis testing. As described in the EPA WET Method Manual EPA 821-R-02-013, Section 10.2.6.2, all test results are to be reviewed and reported in accordance with EPA guidance on the evaluation of the concentration-response relationship. The 23% or greater" limit (based on a dilution factor of 4.40) is defined as a sample which is composed of 23% (or greater) effluent, the remainder being dilution water.

12. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A, Freshwater Chronic Toxicity Test Procedure and Protocol) Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of *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 revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittee. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.
13. For each whole effluent toxicity test, the permittee shall report on the appropriate discharge monitoring report, (DMR), the concentrations of the hardness, ammonia nitrogen as nitrogen, total recoverable aluminum, cadmium, copper, lead, nickel, and zinc found in the 100 percent effluent sample. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachment A**. Also, the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report. These samples may be used to satisfy monitoring requirements elsewhere in the permit, provided the sample types are the same and the methods used will obtain any required MLs.

Part I.A.2

- a. The discharge shall not cause a violation of the water quality standards of the receiving waters.
- b. The pH of the effluent shall not be less than 6.5 or greater than 8.3 at any time.
- c. The discharge shall not cause objectionable discoloration of the receiving waters.
- d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.
- e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.
- f. The permittee shall minimize the use of chlorine, when chlorine is used at the treatment plant, while maintaining adequate bacterial control.
- g. The results of sampling for any parameter done in accordance with EPA approved methods above its required frequency must also be reported.
- h. If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will

maintain compliance with the flow limit and all other effluent limitations and conditions.

3. All POTWs must provide adequate notice to the Director of the following:
 - a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; 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.
 - c. For purposes of this paragraph, adequate notice shall include information on:
 - (1) The quantity and quality of effluent introduced into the POTW; and
 - (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.
4. Prohibitions Concerning Interference and Pass Through:
 - a. Pollutants introduced into POTW's by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.
5. Toxics Control
 - a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.
 - b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.
6. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

B. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall(s) listed in Part I A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported to EPA and MassDEP in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting).

Notification of SSOs to EPA and MassDEP shall be made on its SSO Reporting Form (which includes MassDEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at <http://www.mass.gov/eea/agencies/massdep/service/approvals/sanitary-sewer-overflow-bypass-backup-notification.html>.

C. 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 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. Provisions to meet this requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

2. Preventive Maintenance Program

The permittee shall maintain an ongoing preventive 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. Plans and programs to meet this requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

The permittee shall control infiltration and inflow (I/I) into the 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 Operation and Maintenance Plan (O & M Plan) required pursuant to Section C.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. combination manholes);
- d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;
- 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 MassDEP
 - (1) A description of the collection system management goals, staffing, information management, and legal authorities;
 - (2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description 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.8. below.
- b. The full Collection System O & M Plan shall be completed, implemented and submitted to EPA and MassDEP 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 preventive maintenance and monitoring program for the collection system;

- (3) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;
- (4) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;
- (5) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
- (6) A description of the permittee's programs 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 disconnection 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.
- (8) An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan for the previous calendar year and, it shall be submitted to EPA and MassDEP annually by March 31. 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 corrective actions taken during the previous year;
- c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
- d. A map with areas identified for investigation/action in the coming year;
- e. If treatment plant flow has reached 80% of its design flow [1.04 MGD] based on the annual average flow during the reporting year, 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
- f. 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.

7. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned

treatment works¹ it owns and operates.

D. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR Part 503, which prescribe “Standards for the Use or Disposal of Sewage Sludge” pursuant to Section 405(d) of the CWA, 33 U.S.C. § 1345(d).
2. If both state and federal requirements apply to the permittee’s sludge use and/or disposal practices, the permittee shall comply with the more stringent of the applicable requirements.
3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge 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 requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.
5. The 40 CFR Part 503 requirements including the following elements:
 - General requirements
 - Pollutant limitations
 - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
 - Management practices
 - Record keeping
 - Monitoring
 - Reporting

Which of the 40 CFR Part 503 requirements apply to the permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 Guidance document, “EPA Region 1 - NPDES Permit Sludge Compliance Guidance” (November 4, 1999), may be used by the permittee to assist it in determining the applicable requirements.²

¹ As defined at 40 CFR §122.2, which references the definition at 40 CFR §403.3

² 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>

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) 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 +	1 /month

Sampling of the sewage sludge shall use the procedures detailed in 40 CFR 503.8.

7. Under 40 CFR § 503.9(r), the permittee is a “person who prepares sewage sludge” because it “is ... the person who generates sewage sludge during the treatment of domestic sewage in a treatment works” If the permittee contracts with *another* “person who prepares sewage sludge” under 40 CFR § 503.9(r) – i.e., with “a person who derives a material from sewage sludge” – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the permittee does not engage a “person who prepares sewage sludge,” as defined in 40 CFR § 503.9(r), for use or disposal, then the permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR §503.7. If the ultimate use or disposal method is land application, the permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
8. The permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by **February 19** (*see also* “EPA Region 1 - NPDES Permit Sludge Compliance Guidance”). Reports shall be submitted to the address contained in the reporting section of the permit. If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:
- Name and address of contractor(s) responsible for sludge preparation, use or disposal
 - Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge.

E. PERMIT REOPENER

Revisions may be made to the permit pursuant to the Reopener Clause, on page 3 of 25, in Part II. Standard Conditions, Section A. General Conditions.

F. NITROGEN OPTIMIZATION

Within six months of the effective date of this permit, the permittee shall complete an evaluation of alternative methods of operating the existing water pollution control facility to optimize the removal of nitrogen and submit a report to EPA and MassDEP that documents the evaluation and describes operational changes implemented at the treatment facility to remove

nitrogen. The methods evaluated may include but are not limited to, operational changes designed to enhance nitrification, incorporation of anoxic zones and, septage receiving policies and procedures and side stream management. The permittee shall implement the recommended operational changes to maintain the mass discharge of total nitrogen to 52 pounds per day.

The permittee shall also submit an annual report to EPA and MassDEP, by April 1 each year, that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility and, tracks nitrogen trends relative to the previous year.

G. SCHEDULE OF COMPLIANCE

No later than two years from the effective date of the permit, the permittee shall achieve compliance with the zinc limit of 0.0469 mg/l. Within 12 months of the effective date of the permit, the permittee shall submit a report to EPA describing measures taken to achieve compliance with the zinc limit and include a discussion in the report on remaining activities planned to achieve the limit.

H. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to EPA and the MassDEP within the time specified within the permit. Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs and the Use of NetDMR

Beginning the effective date of the permit the permittee must submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and MassDEP no later than the 15th day of the month following the completed reporting period. **For a period of six months from the effective date of the permit**, the permittee may submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and MassDEP either in hard copy form, as described in Part I.G.4, or in DMRs electronically submitted using NetDMR. NetDMR is a web-based tool that allows permittees to electronically submit DMRs and other required reports via a secure internet connection. NetDMR is accessed from: <http://www.epa.gov/netdmr>. **Beginning no later than six months after the effective date of the permit**, the permittee shall begin reporting monthly monitoring data using NetDMR, unless, in accordance with Part I.G.6, the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs. The permittee must continue to use the NetDMR after the permittee begins to do so. When a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs to EPA or MassDEP.

2. Submittal of Reports as NetDMR Attachments

After the permittee begins submitting DMR reports to EPA electronically using NetDMR, the permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as

hard copies, unless otherwise specified in this permit. Permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP. (See Part I.G.5. for more information on state reporting.) Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the particular report due date specified in this permit.

3. Submittal of Requests and Reports to EPA/OEP

The following requests, reports, and information described in this permit shall be submitted to the EPA/OEP NPDES Applications Coordinator in the EPA Office Ecosystem Protection (OEP).

- A. Request for changes in sampling location
- B. Request for reduction in testing frequency
- C. Request for Reduction in WET Testing Requirement
- D. Report on unacceptable dilution water / request for alternative dilution water for WET testing

These reports, information, and requests shall be submitted to EPA/OEP electronically at R1NPDES.Notices.OEP@epa.gov or by hard copy mail to the following address:

**U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP NPDES Applications Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912**

4. Submittal of Reports in Hard Copy Form

The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to EPA.

- A. Written notifications required under Part II
- B. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
- C. Collection System Operation and Maintenance Plan (from co-permittee)
- D. Report on annual activities related to O&M Plan (from co-permittee)
- E. Reports and DMRs submitted prior to the use of NetDMR

This information shall be submitted to EPA/OES at the following address:

**U.S. Environmental Protection Agency
Office of Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912**

Monitoring results shall be summarized for each calendar month and reported on separate hard copy Discharge Monitoring Report Form(s) (DMRs) postmarked no later than the 15th day of the month following the completed reporting period. All reports required under this permit, including MassDEP Monthly Operation and Maintenance Reports, shall be submitted as an attachment to the DMRs. Signed and dated originals of the DMRs, and all other reports or notifications required herein or in Part II shall be submitted to the Director at the following address:

**U.S. Environmental Protection Agency
Office of Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square - Suite 100 (OES04-4)
Boston, MA 02109-3912**

- F. Written notifications required under Part II
- G. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
- H. Reports and DMRs submitted prior to the use of NetDMR

This information shall be submitted to EPA/OES at the following address:

**U.S. Environmental Protection Agency
Office of Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912**

5. State Reporting

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.G.3, I.G.4, and I.G.5 also shall be submitted to the State at the following addresses:

**MassDEP – Central Region
Bureau of Resource Protection (Municipal)
627 Main Street
Worcester, MA 01608**

Copies of toxicity tests and nitrogen optimization reports only shall be submitted to:

**Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608**

6. Submittal of NetDMR Opt-Out Requests

NetDMR 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 be 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

**Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608**

7. Verbal Reports and Verbal Notifications

Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA-New England and to MassDEP. This includes verbal reports and notifications which require reporting within 24 hours. (As examples, see Part II.B.4.c. (2), Part II.B.5.c. (3), and Part II.D.1.e.) Verbal reports and verbal notifications shall be made to EPA's Office of Environmental Stewardship at:

**U.S. Environmental Protection Agency
Office of Environmental Stewardship
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912
617-918-1510**

H. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.
2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 CFR 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.
3. Each agency shall have the independent right to enforce the terms and conditions of this permit. 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 this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of state law such permit shall remain in full force and effect under federal law as a NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic toxicity data shall be reported as outlined in Section VIII.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition, October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at <http://www.epa.gov/waterscience/WET/> . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6° C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body 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. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2, Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code 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.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥ 3 standard deviations for IC25 values and \geq two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

<u>Parameter</u>	Effluent	Receiving Water	ML (mg/l)
Hardness ^{1, 4}	x	x	0.5
Total Residual Chlorine (TRC) ^{2, 3, 4}	x		0.02
Alkalinity ⁴	x	x	2.0
pH ⁴	x	x	--
Specific Conductance ⁴	x	x	--
Total Solids ⁶	x		--
Total Dissolved Solids ⁶	x		--
Ammonia ⁴	x	x	0.1
Total Organic Carbon ⁶	x	x	0.5
Total Metals ⁵			
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
 - USEPA 1983. Manual of Methods Analysis of Water and Wastes
 - Method 330.5
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at <http://water.epa.gov/scitech/methods/cwa/> . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value, for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.
- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: [Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program](#) can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater than the PMSD lower bound, then the treatment is considered statistically significant.
- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
 - Facility name
 - NPDES permit number
 - Outfall number
 - Sample type
 - Sampling method
 - Effluent TRC concentration
 - Dilution water used
 - Receiving water name and sampling location
 - Test type and species
 - Test start date
 - Effluent concentrations tested (%) and permit limit concentration
 - Applicable reference toxicity test date and whether acceptable or not
 - Age, age range and source of test organisms used for testing
 - Results of TAC review for all applicable controls
 - Test sensitivity evaluation results (test PMSD for growth and reproduction)
 - Permit limit and toxicity test results
 - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

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/methods/cwa/wet/disk2_index.cfm

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°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/enforcement/water/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 TESTS¹

1.	Test type	Static, non-renewal
2.	Temperature (°C)	20 ± 1°C or 25 ± 1°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 <u>Selenastrum</u> 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	≥ 0.5, must bracket the permitted RWC
15.	Number of dilutions	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 TEST¹**

1. Test Type	Static, non-renewal
2. Temperature (°C)	$20 \pm 1^{\circ} \text{C}$ or $25 \pm 1^{\circ} \text{C}$
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 other
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	≥ 0.5 , must bracket the permitted RWC

15. Number of dilutions	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.

<u>Parameter</u>	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	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:

- 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)
- 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
- 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-Kärber
- Trimmed Spearman-Kärber
- 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.

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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.

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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.

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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.

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- (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

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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

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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

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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.

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- 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.

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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.

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- (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

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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

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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).

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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.

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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.

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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.

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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.

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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,

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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.

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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.

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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 of 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 of 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.

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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.

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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.)

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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

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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
NEW ENGLAND
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FACT SHEET

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

NPDES PERMIT NO.: MA0100421

PUBLIC NOTICE START AND END DATES : **June 25, 2014 – July 24, 2014**

NAME AND ADDRESS OF APPLICANT:

**Town of Sturbridge
308 Main Street
Sturbridge, MA 01566**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Sturbridge Water Pollution Control Facility, (Sturbridge WPCF)
1 New Boston Road Extension
Sturbridge, MA 01566**

RECEIVING WATER: **Quinebaug River, Segment (MA41-02)**

CLASSIFICATION: **Class B, Cold Water Fishery**

I. Proposed Action, Type of Facility, and Discharge Location

The Town of Sturbridge has requested that the United States Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (MassDEP) reissue its NPDES permit to discharge into the Quinebaug River. The Sturbridge WPCF is engaged in the collection and treatment of municipal wastewater.

The existing NPDES permit was signed on September 28, 2006, became effective on December 1, 2006 and expired on November 30, 2011. The applicant filed a complete application as required by 40 Code of Federal Regulations (CFR) Part 122.6, so the existing permit has been administratively extended and will remain in effect until a renewed permit has been issued. The existing permit and draft permit authorize a discharge only from Outfall 001 at the facility.

The draft permit includes effluent limits based on a permitted flow of 1.3 million gallon per day (MGD), an increase from the flow in the existing permit. The authorization of this flow increase is explained in greater detail later in the fact sheet.

II. Quantitative Data, Tables and, Figures in the Fact Sheet

The attachments and figures to the fact sheet are:

Attachment A	Summary of NPDES Permit Reporting Requirements
Attachment B	Sturbridge Water Pollution Control Facility-Discharge Monitoring Report Data
Attachment C	Effluent and Ambient Hardness Data
Attachment D	Whole Effluent Toxicity Test Chemistry Data
Figure 1	Site Locus Map
Figure 2	WWTP Flow Process Diagram

III. Limitations and Conditions

The proposed effluent limitations and monitoring requirements may be found in the draft permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation

Treatment Plant Description

The Town currently operates an advanced wastewater treatment facility located in Sturbridge, Massachusetts that serves approximately 5,000 people. There are no significant industrial users contributing wastewater to the plant and the collection system consists of separate sewers.

The Town recently completed extensive upgrades at the facility. Wastewater entering the facility flows to a new process building where screening, measurement, grit removal and chemical addition for nutrient precipitation takes place. After chemical addition, wastewater is treated with a BioMag system. This is a biological treatment process in which magnetite is added to 2 of 3 aeration tanks (3 tanks are not needed at this time) and generates biomass to enhance biological treatment and solids separation. It provides enhanced removal of biochemical oxygen demand, total suspended solids, ammonia and phosphorus and is also configured with anoxic zones to provide denitrification.

Tertiary treatment is then provided with a CoMag system, which provides effluent polishing and removes additional phosphorus. CoMag is a “magneto-chemical” wastewater treatment process that incorporates the use of finely divided magnetic ballast to bind precipitated phosphorus and other fine particulates. Magnetite provides a “magnetic ballast seed” that when mixed with alum and polymer increases both flocculation and settling rates prior to filtration.

The effluent then flows through a new ultraviolet (UV) system for disinfection before it is discharged into Segment MA41-02 of the Quinebaug River.

Sludge from secondary and tertiary treatment is processed through a sludge belt thickener prior to being hauled off-site for incineration.

Overview of Federal and State Regulations

The Clean Water Act (CWA or the Act) prohibits the discharge of pollutants to waters of the United States without an NPDES permit unless such a discharge is otherwise authorized by the Act. An NPDES permit is used to implement technology-based effluent limitations, water quality-based effluent

limitations and other requirements such as monitoring and reporting. This draft NPDES permit was developed in accordance with statutory and regulatory authorities established pursuant to the Act. The regulations governing the NPDES program are found in 40 CFR Parts 122, 124, and 125.

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Act.

Under Section 301(b)(1)(B) of the CWA, publicly owned treatment works (POTWs) must have achieved effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth at 40 CFR Part 133.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to limits more stringent than technology-based limits where necessary to meet water quality standards. The Massachusetts Surface Water Quality Standards (MA SWQS) include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, be used unless a site specific criterion is established. The MA SWQS (314 CMR 4.00) also require that discharges of pollutants to surface waters be limited or prohibited to assure that surface water quality standards of the receiving waters are protected and maintained or attained. See 314 CMR 4.03(1)(a). EPA regulations at 40 CFR 122.44(d)(1)(i), require that the permit limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion. An excursion occurs if the projected or actual in-stream concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and, where appropriate, the dilution of the effluent in the receiving water.

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirement of the CWA. EPA's anti-backsliding provisions, found in Sections 402(o) and 303(d)(4) of the CWA and at 40 CFR 122.44(l), prohibit the relaxation of permit limits, standards, and, conditions except under certain, limited conditions. Anti-backsliding provisions apply to effluent limits based on technology, water quality, Best Professional Judgment and State Certification requirements. Therefore, the effluent limits in the reissued permit must be at least as stringent as those in the existing permit, unless a less stringent effluent limit is allowed under the provisions of the law and regulations.

Waterbody Classification and Usage

The facility discharges to segment (MA41-02) of the Quinebaug River as described on page 120 of the French & Quinebaug River Watersheds 2004 -2008 Water Quality Assessment Report (Assessment Report) published by the MassDEP in November 2009. A copy of the Assessment Report can be reviewed at <http://www.mass.gov/dep/water/resources/wqassess.htm>. This segment of the river is classified as a Class B water. A Class B water is defined in MA SWQS at 314 CMR 4.05(3)(b),

Class B waters are designated as habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. Where designated in 314 CMR 4.06, they shall be suitable as a source of public water supply with appropriate treatment ("Treated Water Supply"). Class B waters shall be suitable for irrigation and

*other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.*¹

The effluent is discharged into a cold water fishery. A cold water fishery is defined in the MA SWQS

*“..as water in which the mean of the maximum daily temperature over a seven day period generally does not exceed 68° (20° C) and, when other ecological factors are favorable (such as habitat), are capable of supporting a year-round population of cold water stenothermal aquatic life such as trout (salmonidae).”*²

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters. To meet this goal, the CWA requires States to develop information on the quality of their water resources and report this information to the EPA, the U.S. Congress, and the public. To this end, the EPA released guidance on November 19, 2001, for the preparation of an integrated “List of Waters” that could combine reporting elements of both §305(b) and §303(d) of the CWA. The integrated list format allows the States to provide the status of all their assessed waters in one list. States choosing this option must list each water body or segment in one of the following five categories:

1) Unimpaired and not threatened for all designated uses; 2) Unimpaired waters for some uses and not assessed for others; 3) Insufficient information to make assessments for any uses; 4) Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) Impaired or threatened for one or more uses and requiring a TMDL.

The MassDEP combines the requirements in Sections 305(b) and 303(d) of the CWA into one report titled, “*Final Massachusetts Year 2012 Integrated Lists of Water*” (2012 Integrated List) and it is available on the MassDEP website, <http://www.mass.gov/dep/water/resources/08lists2.pdf>. Segment MA41-02 of the Quinebaug River is listed in the report as not in attainment of state water quality standards which requires the State to develop a TMDL due to water quality impairment caused by excessive algal growth and turbidity.

Environmental Impact Report/Comprehensive Wastewater Management Planning

In 2007, the Town began planning for necessary upgrades to the existing treatment plant, which had been in operation since 1978. The Massachusetts Environmental Policy Act Office (MEPA) required preparation of an Environmental Impact Report (EIR). The plan of study (POS) for the EIR included a Comprehensive Wastewater Management Plan (CWMP). In a CWMP, current and future wastewater needs are evaluated, wastewater management alternatives are developed which will meet these needs, and a final plan is chosen through careful comparison and evaluation of the alternatives. The process must include the necessary steps in ensuring that the planning effort results in the most cost effective, environmentally sound wastewater management plan.³ In its CWMP, the Town selected a plan that included the expansion of the wastewater treatment plant to a design flow of 1.3 MGD. The Town constructed the expanded facility, completing it in May 2012. A letter to EPA dated May 19, 2011, from the Town’s consulting engineer, provides information on the Town’s wastewater planning and construction activities. The purpose of the letter was to notify the regulatory community on the status of the upgrades at the treatment plant to be incorporated into the renewed NPDES permit. The letter also provided a timeline of the CWMP process. A copy of the letter can be found in EPA’s NPDES administrative file for the Sturbridge WPCF.

¹ Massachusetts Surface Water Quality Standards, 314 CMR 4.05(3)(b).

² Massachusetts Surface Water Quality Standards, 314 CMR 4.02.

³ See Department of Environmental Protection, Bureau of Municipal Facilities, Guide to Comprehensive Wastewater Management Planning, January 1996.

On January 25, 2013, the Secretary of the Executive Office of Energy and Environmental Affairs (EOEEA) signed a certificate stating that the Final Environmental Impact Report (FEIR) submitted for the Sturbridge CWMP complied with the Massachusetts Environmental Policy Act (G.L.c.30, ss. 61-621) and with its implementing regulations (301 CMR 11.00). The FEIR included an increase in the design flow of the facility to 1.3 MGD.

The draft permit authorizes the increased flow, and includes effluent limitations consistent with meeting water quality standards, including the antidegradation provisions at 314 CMR 4.04.

Antidegradation

In accordance with 40 CFR 131.12, the MA SWQS at 314 CMR 4.04 include an antidegradation provision that ensures that existing instream water uses are protected and maintained, and water quality levels in high quality waters are protected and maintained. MassDEP published a policy document, titled “Implementation Procedures for the Antidegradation Provisions of the Massachusetts Surface Water Quality Standards (Implementation Procedures)” on October 21, 2009 that explains how the antidegradation provisions of the State standards are implemented. The Implementation Procedures apply to all new or increased point source discharges to waters of the Commonwealth requiring a permit under 314 CMR 3.00. The Implementation Procedures establish a technology-based review for all discharges, and four tiers of additional review dependent on the quality of the receiving water.

Technology-based review

As stated in the Implementation Procedures, the “minimum technology based treatment requirements for publicly owned treatment works (POTWs) consist of secondary treatment and applicable limitations and standards promulgated by EPA” and “[t]he technology based review for POTWs subject to the SRF⁴ process generally is satisfied upon completion of the Comprehensive Wastewater Management Plan or Project Evaluation Report, public participation and Department approval.” Section II. In this case, the treatment provided for the increased flow is far better than required to achieve secondary treatment requirements and the CWMP has been approved, so the technology based requirements of the Implementation Procedures have been satisfied.

Tier Review

The primary focus of each Tier review is listed below:

Tier 1	review to protect existing uses in all waters
Tier 2	review to protect and maintain existing water quality in high quality waters
Tier 2 1/2	review to protect outstanding resource waters
Tier 3	review to protect special resource waters

As can be seen, each tier is associated with a specific receiving water designation. The Implementation Procedures require greater protection for higher value waters.

New or increased discharges to special resource waters (Tier 3) are essentially prohibited.

⁴ SFR, State Revolving Fund.

New or increased discharges to outstanding resource waters (Tier 2 ½) are allowed only where the discharge is determined, among other things, to be for the express purpose and intent of maintaining or enhancing the resource for its designated use.

New or increased discharges to high quality waters (Tier 2) may be allowed only if insignificant, or if authorized pursuant to 314 CMR 4.04(5). These waters must be protected and maintained for their existing water quality. Authorization of a significant increase requires a demonstration that:

1. The discharge is necessary to accommodate important economic or social development in the area in which the waters are located⁵;
2. No less environmentally damaging alternative site for the activity, receptor for the disposal, or method of elimination of the discharge is reasonably available or feasible;
3. To the maximum extent feasible, the discharge and activity are designed and conducted to minimize adverse impacts on water quality, including implementation of source reduction practices; and
4. The discharge will not impair existing water uses and will not result in a level of water quality less than that specified for the Class.

314 CMR 4.04(5)(a). New or increased discharges to all other waters (Tier 1) may be allowed, providing that existing uses, and water quality to protect those uses, is maintained and protected.

The first step then, is to determine the receiving water classification and condition in order to determine the applicable tier(s). To determine the classification and condition of the Quinebaug River in the vicinity of the discharge, EPA reviewed the MA SWQS (314 CMR 4.00), the *2012 Integrated List*, the French & Quinebaug River 2004-2008 Water Quality Assessment Report, and receiving water monitoring data, including data collected on the receiving water upstream of the discharge by the permittee in conjunction with its whole effluent toxicity tests.

The MA SWQS list the Quinebaug River downstream of the discharge as a Class B cold water fishery. The designated uses for these waters were discussed earlier in this fact sheet in the section titled **Waterbody Classification and Usage**. The segment of the Quinebaug River downstream of the discharge is not defined by MassDEP as an outstanding resource water or a special resource water, therefore the Implementation Procedures for Tiers 2 ½ and 3 review are not applicable. Therefore, in this case, it must be determined whether the receiving water is a High Quality Water (Tier 2). Pursuant to the Implementation Procedures a water is high quality if its water quality is better than the minimum levels necessary to support the national goals uses of propagation of fish, shellfish and wildlife and recreation in and on the water. This determination is made on a criteria by criteria basis (i.e., a water need not be better than all criteria to be considered high quality; rather a water is considered high quality with respect to any individual parameter that is better than the minimum criteria for its Class and for which the applicant proposes a discharge of pollutants).

⁵For POTWs, if the proposed discharge is subject to the Clean Water State Revolving Fund (SRF) process, is in accordance with a Comprehensive Wastewater Management Plan (CWMP) or Project Evaluation Report, has been subject to public participation, and is approved by the State, then it is presumed that the requirement of economic or social importance has been met. The requested flow increase is the result of a CWMP that has been approved by the State, so the requirement of 314 CMR 4.04(5)(a)(1) has been met; a demonstration as to 314 CMR .04(5)(a)(2) through (4) would still be required for any significant increase.

To determine which pollutants, if any, are subject to Tier 2 review, EPA first reviewed the available water quality data for the receiving water. The 2012 *Integrated List* has the segment of the river downstream of the discharge as a Category 5 Water, impaired and requiring a TMDL for algal growth and turbidity, so that the receiving water is considered Tier 1 for pollutant parameters related to those impairments (i.e., total suspended solids, nitrogen and total phosphorus.) The most recent water quality assessment report, “French and Quinebaug River Watershed 2004 -2008 Water Quality Assessment Report”, contains little water quality data on this segment, consisting primarily of fish population surveys and a discussion of whole effluent toxicity tests conducted on the Sturbridge WPCF effluent⁶ and therefore provides little information for determining the appropriate Tier.

The current permit includes water quality-based limits for biochemical oxygen (BOD₅), carbonaceous biochemical oxygen (CBOD₅), total suspended solids (TSS), dissolved oxygen, fecal coliform, total chlorine residual, copper, total phosphorus, ammonia nitrogen, and whole effluent toxicity, based on previous analyses indicating that such limits are necessary to meet water quality standards in the receiving water (no additional assimilative capacity is available). In general, the draft permit holds pollutant loads the same as the loads authorized by the current permit.

For pollutants not limited in the current permit, EPA has performed calculations to estimate the instream concentration of the pollutant at the current design flow⁷. If the calculated instream concentration is equal to or greater than the criteria, then the water is not high quality (Tier 1) and a limit is calculated that will attain water quality standards at the increased flow. If these calculations show that the instream concentration is less than the applicable criteria, the water is considered high quality for that pollutant (Tier 2) and EPA then determines whether the proposed increase in flow would use 10 percent or less of the remaining assimilative capacity (i.e., an insignificant increase).

Review of metals data showed that all metals except aluminum are Tier 2. See the **Metals** section for a detailed discussion of the assimilative capacity analysis for these pollutants. For aluminum, the data shows that the discharge exceeds the chronic water quality criteria even at the previous design flow of 0.75 MGD, and the increase in flow would result in an instream concentration greater than 10 percent of acute assimilative capacity. See the Aluminum section for a detailed discussion of the limit-setting process.

MassDEP is hereby notifying the public that it has made a tentative determination to authorize the increased discharge, and is inviting public comment regarding this determination, and on the proposed limits associated with this determination.

River Flow and Available Dilution

Water quality-based effluent limits in the draft permit are determined using water quality criteria and the available dilution during the lowest mean stream flow for seven consecutive days with a ten year recurrence interval, commonly known as the 7Q10 low flow. For rivers and streams, Massachusetts regulations at 314 CMR 4.03(3)(a) requires that the 7Q10 low flow be used to represent the critical hydrologic conditions at which the instream water quality criteria must be met. The 7Q10 low flow at the

⁶ While three of the 32 tests considered showed chronic toxicity for fathead minnows and one showed chronic toxicity for daphnids, these tests were conducted before the recent upgrades of the treatment plant were completed and tests conducted after completion of the upgrades have met the acute and chronic permit limits.

⁷ EPA also conducted this analysis for two parameters with current permit limits: phosphorus (for which the current permit limit is based on “highest and best practicable treatment”) and copper (for which the criteria have changed since the issuance of the current permit).

discharge and the ambient flow upstream of the discharge are used to calculate a dilution factor.

EPA and MassDEP calculated a dilution factor of 4.40 for a design flow of 1.3 mgd. The dilution factor was calculated using the 7Q10 low flow measured at the USGS gage (1123360), located upstream of the Sturbridge discharge, the drainage area at the gage station, and an estimated drainage area at the discharge location. This 7Q10, and the previous design flow of 0.75 mgd were also used to determine assimilative capacity in the antidegradation analysis.

Q_{gage} = Estimated 7Q10 flow at the gage = 6.13 cfs

A_{gage} = Drainage area at gage = 67.4 square miles

A_{outfall} = Estimated drainage area at the outfall = 75.1 square mile

Q_d = 1.3 MGD (2.01 cfs), 0.75 MGD (1.16 cfs)

$$Q_{7Q10 \text{ at outfall}} = \frac{A_{\text{outfall}}}{A_{\text{gage}}} * (Q_{\text{gage}})$$

$$Q_{7Q10 \text{ at outfall}} = \frac{75.1 \text{ sq.mi.}}{67.4 \text{ sq.mi.}} * (6.13)$$

$$Q_{7Q10 \text{ at outfall}} = 6.83 \text{ cfs}$$

Plant Design flow is 1.3 MGD (2.01 cfs)

Dilution Factor is $(6.83 + 2.01)/2.01 = 4.40$

Permit Limits and Effluent Data

Effluent Flow

The annual average flow limit in the draft permit is 1.3 MGD. The annual average flow reported on the Town's DMRs from May 2012 through January 2014 ranged from 0.467 MGD to 0.562 MGD.

Biochemical Oxygen Demand (BOD₅), Carbonaceous Biochemical Oxygen Demand (CBOD₅) and, Total Suspended Solids (TSS), Dissolved Oxygen (DO), pH and Bacteria

The limits for BOD₅, CBOD₅, TSS, DO, pH, and bacteria are based on MA SWQS and have been established to achieve water quality standards for a Class B water.

BOD₅, CBOD₅ and, TSS

The mass (lbs/day) limits for BOD₅, CBOD₅ and, TSS in the draft permit are based on a wasteload allocation determined by MassDEP. The same limits are in the current permit, and they are more stringent than technology-based secondary treatment requirements found at 40 CFR Part 133. The concentration limits for BOD₅, CBOD₅ and TSS have been reduced to correspond to the mass limit and the increased discharge flow. Maintaining the same mass loading limits that are in the current permit ensures there is no degradation of receiving water quality.

For the months of October through March, the monthly average and weekly average BOD₅ and TSS limits will be 12 mg/l and 125 lbs/day and, the maximum daily BOD₅ and TSS limits are 17 mg/l and 188 lbs/day.

During the warm weather season (April through September), the limits are expressed as carbonaceous biochemical oxygen (CBOD₅) demand rather than BOD₅ in order to minimize false indications of poor facility performance as a result of nitrogenous oxygen demand. The monthly average and weekly average CBOD₅ and TSS limits are 6 mg/l and 63 lbs/day, and the maximum daily limits are 9 mg/l and 94 lbs/day.

There were no BOD₅ or CBOD₅ exceedances from May 2012 through January 2014. There were two exceedances of the daily maximum TSS during this time period. See Attachment B, Sturbridge Water Pollution Control Facility - Discharge Monitoring Report Data, of the fact sheet for recent DMR data.

The draft permit also contains 85% BOD₅ and TSS removal limitations based on the requirements of 40 CFR 133.102(3). These limitations are the same as in the existing permit. A review of DMR data from May 2012 through January 2014 indicates the facility has been in compliance with these effluent limits.

DO

The DO permit limit requires effluent DO to be equal to or greater than 6.0 mg/l, the same as in the existing permit. The DO criteria for a Class B water listed as a cold water fishery in the MA SWQS, 314 CMR 4.05 (3)(b)(3) is, "no less than 6.0 mg/l unless background conditions are lower".

See Attachment B, Sturbridge Water Pollution Control Facility - Discharge Monitoring Report Data, for recent DO data submitted on the DMRs. There were no DO exceedances reported from May 2012 through January 2014.

pH

The draft permit has pH limits that are at least as stringent as the requirements set forth at 40 CFR 133.102(c) and the Massachusetts Water Quality Standards for Class B waters at 314 CMR 4.05 (4)(b)(3). Class B waters must maintain a pH range of 6.5 through 8.3 standard units with not more than 0.5 standard units outside of the receiving water background range. The water quality standards also require there be no change from background conditions that would impair any use assigned to this class.

See Attachment B, Sturbridge Water Pollution Control Facility - Discharge Monitoring Report Data, for recent pH data submitted on the DMRs. There were no pH exceedances reported from May 2012 through January 2014.

Fecal coliform bacteria and Escherichia coli (E.coli) bacteria

On December 29, 2006, MassDEP revised the bacteria criteria in its water quality standards for Class B waters, changing the criteria from fecal coliform bacteria to Escherichia coli (E. coli) bacteria. EPA approved this revision on September 19, 2007 and, the draft permit reflects this change.

To allow time for the permittee to meet the revised bacteria standards, the fecal coliform limits will be in effect for the duration of the first disinfection season (April-October) following the effective date of the permit. Fecal coliform limits in the draft permit are the same as in the existing permit; a monthly average geometric mean of 200 colony forming units (cfu) per 100 ml and a daily maximum geometric mean of 400 cfu per 100 ml. As described in Footnote 6 of the draft permit limitations for E.coli bacteria will become effective after the first disinfection period the permit is in effect, and will remain in effect for the duration of the permit. Once the E.coli bacteria limits become effective, the fecal coliform monitoring

requirements and effluent limits will end.

The permit provides a one year period for the operators at the facility to make adjustments at the treatment plant to consistently attain the new E.coli bacteria limits however, E.coli bacteria monitoring and reporting are required to begin upon the effective date of the permit.

The E. coli bacteria limitations proposed in the draft permit are a monthly average geometric mean of 126 colony forming units per 100 ml (cfu/ml) and a maximum daily value of 409 cfu/100 ml. The maximum daily value is the ninety percentage (90%) distribution of the geometric mean of 126 cfu/ml. The monitoring frequency is once per month prior to the limits becoming effective and twice per week after the limits become effective.

Attachment B, Sturbridge Water Pollution Control Facility - Discharge Monitoring Report Data, provides DMR data for fecal coliform from May 2012 through January 2014. There were no exceedances of the monthly average or maximum daily limit during this time period.

Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. The existing permit includes effluent limits on only one metal, copper.

Chemistry data from the facility's Whole Effluent Toxicity Tests (WET) were reviewed to determine reasonable potential for toxicity caused by aluminum, cadmium, copper, lead, nickel and zinc. Attachment D, Whole Effluent Toxicity Chemistry Data shows effluent data and ambient data upstream of the discharge for each metal listed.

Metals may be present in both dissolved and particulate forms in the water column. Extensive studies suggest that it is the dissolved fraction that is biologically available, and therefore, presents the greatest risk of toxicity to aquatic life inhabiting the water column. This conclusion is widely accepted by the scientific community both within and outside of EPA (Water Quality Standards Handbook: Second Edition, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-005a]. Also see <http://www.epa.gov/waterscience/standards/handbook/chapter03.html#section6>). As a result, water quality criteria are established in terms of dissolved metals.

However, many inorganic components of domestic wastewater, including metals, are in the particulate form, and differences in the chemical composition between the effluent and the receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007])). Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water.

Regulations at 40 CFR 122.45(c) require, with limited exception, that metals limits in NPDES permits be expressed as total recoverable metals. The facility's effluent concentrations were characterized assuming a lognormal distribution in order to determine the estimated 95th percentile of the daily maximum.

For metals with hardness-based water quality criteria, the criteria were determined using the equations in

EPA National Recommended Water Quality Criteria: 2002. EPA's Office of Water - Office of Science and Water Technology stated in a letter dated July 7, 2000 that; "The hardness of water containing the discharged toxic metal should be used for determining the applicable criterion. Thus the downstream hardness should be used." Hardness is reported as an equivalent concentration of calcium carbonate.

The hardness of the Quinebaug River downstream of the treatment plant's outfall under 7Q10 low flow conditions was calculated using the median upstream receiving water hardness and the effluent hardness data reported in toxicity tests. EPA calculated the hardness downstream of the discharge for the existing design flow of 0.75 MGD (1.16 cfs) and the proposed design flow of 1.3 MGD (2.01 cfs) in the mass balance equations shown below. Attachment C, Effluent and Ambient Hardness provides the data used below.

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

Where:

Q_s = 7Q10 river flow upstream of plant = 6.83 cfs

Q_d = the discharge flow from the plant = 1.3 MGD (2.01 cfs), 0.75 MGD (1.16 cfs)

Q_r = the sum of the downstream river flow (7Q10 + plant flow) = 8.84 cfs, 7.99 cfs

C_s = the upstream hardness concentration = 22 mg/l (WET test results)

C_d = the effluent hardness = 140 mg/l (WET test results)

C_r = the receiving water hardness downstream of the outfall

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r} = \frac{(2.01 \text{ cfs})(140 \text{ mg/l}) + (6.83 \text{ cfs})(22 \text{ mg/l})}{(8.84 \text{ cfs})} = 48.83 \text{ mg/l}$$

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r} = \frac{(1.16 \text{ cfs})(140 \text{ mg/l}) + (6.83 \text{ cfs})(22 \text{ mg/l})}{(7.99 \text{ cfs})} = 39.13 \text{ mg/l}$$

The downstream hardness of 49 mg/l CaCO_3 (at a discharge flow of 2.01 MGD) and 39 mg/l CaCO_3 (at a discharge flow of 0.75 MG) were used in the reasonable potential calculations for metals that are hardness dependent.

Table 1, Acute and Chronic Total Recoverable Criteria for Metals under current (0.75 MGD) and increased (1.3 MGD) Flow, present the factors used to determine the acute and chronic total recoverable criteria for each metal.

Table 1. Acute and Chronic Total Recoverable Criteria for Metals under current (0.75 MGD) and increased (1.3 MGD) Flow

Metal	Parameters				Total Recoverable Criteria			
					0.75 mgd (H=39)		1.3 mgd (H=49)	
	ma	ba	mc	bc	Acute Criteria (CMC) ¹ (ug/L)	Chronic Criteria (CCC) ² (ug/L)	Acute Criteria (CMC) ¹ (ug/L)	Chronic Criteria (CCC) ² (ug/L)
Aluminum	—	—	—	—	750	87	750	87
Cadmium	1.0166	-3.924	0.7409	-4.719	0.819	0.13	1.03	0.16
Copper	—	—	—	—	25.7	18.1	25.7 ³	18.1 ³
Lead	1.273	-1.46	1.273	-4.705	24.62	0.96	32.93	1.28
Nickel	0.846	2.255	0.846	0.0584	211.53	23.52	256.59	28.53
Zinc	0.8473	0.884	0.8473	0.884	53.95	53.95	65.47	65.47

¹ Acute Criteria (CMC) = $\exp\{ma*\ln(\text{hardness})+ba\}$

² Chronic Criteria (CCC) = $\exp\{mc*\ln(\text{hardness})+bc\}$

³ Site specific criteria for the Quinebaug River – See 314CMR 4.06, Table 28

In order to determine whether the effluent has the reasonable potential to cause or contribute to an exceedence above the in-stream water quality criteria for each metal at a flow of 1.3 MGD, the following mass balance equation is used to project in-stream metal concentrations downstream from the discharge.

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

rewritten as:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

where:

Q_d = effluent flow (design flow = 1.3 MGD (2.01 cfs))

C_d = effluent metal concentration in ug/L (95th percentile)

Q_s = stream flow upstream (7Q10 upstream = 6.83 cfs)

C_s = background in-stream metal concentration in ug/L = WET Test Data

Q_r = in-stream flow, downstream of the discharge ($Q_s + Q_d = 8.84$ cfs)

C_r = downstream criteria concentration in ug/L

Reasonable potential is then determined by comparing this downstream concentration (for both acute and chronic conditions) with the acute and chronic criterion for each metal. In EPA's Technical Support Document for Water Quality Based Toxics Control, EPA/505/2-90-001, March 1991, commonly known as the "TSD", box 3-2 describes the statistical approach in determining if there is reasonable potential for an excursion above the maximum allowable concentration criterion. If there is reasonable potential (for either acute or chronic conditions), the appropriate limit is then calculated by rearranging the above mass balance equation to solve for the effluent concentration (C_d) using the criterion as the resultant in-stream concentration (C_r). See Table 2, Reasonable Potential Table, below for the results for metals. Additional considerations for copper are necessary given the new site specific criteria, which were not used to calculate the current permit limit. Copper limits are discussed in a separate section following the calculations for other metals.

Table 2. Reasonable Potential Table

Based on 1.3 MGD (2.01 cfs)

A	B	C	D	E	F	G	H		I	J	
Metal	Qd	Cd ¹ (95th Percentile)	Qs	Cs ³ (Median)	Qr = Qs + Qd	Cr _{1.3} = (QdCd+QsCs) /Q _R	Criteria		Reasonable Potential	Limit = (Qr*Criteria- 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	2.01	1118.77	6.83	39	8.84	284.34	750.0	87.0	Y	N/A	250
Cadmium ²		0.25		0.25		0.25	1.03	0.16	Y	N/A	N/A
Copper		11		1		3.27	25.7	18.1	N	N/A	N/A
Lead		0.65		0.25		0.34	32.93	1.28	N	N/A	N/A
Nickel		6.88		1		2.34	256.59	28.53	N	N/A	N/A
Zinc		81.33		1		19.19	65.47	65.47	N	N/A	N/A

¹Values calculated using data from the reasonable potential analyses with the exception of cadmium (see Reasonable Potential Analyses in the administrative file).

²The data were all less than 0.5 ug/l, the minimum detection level. The 95th percentile (Cd) and the in-stream concentration (Cs) are based on half the minimum detection level.

³Median upstream metals data reported in Whole Effluent Toxicity (WET) Tests on the Quinebaug River just upstream of the Sturbridge WPCF see Attachment D, Whole Effluent Toxicity Test Chemistry Data).

As indicated into column J, Table 2. Reasonable Potential Table, there is reasonable potential that the discharge of aluminum and cadmium will cause or contribute to an exceedance of the applicable chronic water quality criteria. A monthly average aluminum limit has been included in the draft permit.

For cadmium, the instream concentration exceeds the chronic criterion however, the data reported in the facility's whole effluent toxicity tests were all less than the minimum detection level of 0.5 ug/l (see Attachment D, Whole Effluent Toxicity Test Chemistry Data). The data does not support a finding of reasonable potential to cause or contribute to an exceedance of the applicable chronic criterion. Therefore, the draft permit requires continued monitoring and reporting for cadmium only. Monitoring of all listed metals in the table above as well as chromium will continue to be required as part of the annual Whole Effluent Toxicity (WET) tests.

In consideration of antidegradation in the case of high quality waters, EPA considered whether the proposed increase in discharge would use more than 10% of the assimilative capacity of the receiving water. To do this EPA:

1. calculated the instream concentration of pollutants that would result from the discharge at 0.75 mgd, using the upstream 7Q10 flow and pollutant concentrations, and the effluent concentrations (see Column Q, Table 3);
2. subtracted these concentrations from the applicable water quality criteria, giving an estimate of assimilative capacity (see Column T, Table 4);
3. calculated 10 percent of this assimilative capacity for each pollutant and added it to the calculated receiving water concentration, to arrive at an estimate of the maximum concentration threshold corresponding to an "insignificant" increase (current receiving water concentration plus 10 percent of the assimilative capacity (see Column V, Table 4).

If the estimated receiving water concentration at a 1.3 MGD design flow is greater than the threshold "insignificant" concentrations calculated above, then the expected instream concentrations at the increased design flow exceed 10 percent of the assimilative capacity and are significant relative to the State's antidegradation policy for a Tier 2 review. (see Column W, Table 4); positive values indicate significant increase; negative values or zero values indicate they are not. The change is significant for aluminum and zinc therefore further consideration is required. None of the increases on other metals are significant, so no limits (except for copper, which has a limit in the current permit and is subject to antibacksliding requirements) are required pursuant to antidegradation. Following the discussion on aluminum and zinc below there is a section on copper that discusses the limit setting procedure that took into account the new site specific state water quality criteria

Table 3. Instream Concentration at 0.75 MGD Discharge Flow

	Based on 0.75 mgd (1.16 cfs)							
K	L	M	N	O	P	Q	R	
Metal	Qd (cfs)	Cd ¹ (95th Percentile) (ug/l)	Qs (cfs)	Cs ³ (Median) (ug/l)	Qr = Qs + Qd (cfs)	Cr _(0.75) = (QdCd+QsCs)/Q _R (ug/l)	Criteria	
							Acute (ug/l)	Chronic (ug/l)
Aluminum	1.16	1118.77	6.83	39	7.99	195.76	750	87
Cadmium ²		0.25		0.25		0.25	0.819	0.13
Copper		11		1		2.45	25.7	18.1
Lead		0.65		0.25		0.31	24.62	0.96
Nickel		6.88		1		1.85	211.53	23.52
Zinc		81.33		1		12.61	53.95	53.95

¹ Values calculated using data from the reasonable potential table with the exception of cadmium (see Reasonable Potential Analyses in the administrative file).

² The data were all less than 0.5 ug/l, the minimum detection level. The 95th percentile (Cd) and the in-stream concentration (Cs) are based on half the minimum detection level.

³ Median upstream metals data reported in Whole Effluent Toxicity (WET) tests on the Quinebaug River just upstream of the Sturbridge WWTF (see Attachment C, Whole Effluent Toxicity Test Chemistry Data).

Table 4. Assessment of Significance

Based on 0.75 mgd (1.16 cfs)								
S	T		U		V		W	
Metal	Assimilative capacity = Criteria-Cr_(0.75)		10 percent of Assimilative capacity		Cr_(0.75) plus 10 percent of Assimilative Capacity		Cr_(1.3)- (Cr_(0.75) + 10 % of Assimilative Capacity)	
	Acute ug/l	Chronic ug/l	Acute ug/l	Chronic ug/l	Acute ug/l	Chronic ug/l	Acute ug/l	Chronic ug/l
Aluminum	554.24	None*	55.42	None*	251.19	N/A	33.19	NA*
Cadmium	0.57	None*	0.06	None*	0.31	N/A	-0.06	NA*
Copper	23.25	15.65	2.32	1.56	4.78	4.02	-1.50	-0.74
Lead	24.31	0.65	2.43	0.06	2.74	0.38	-2.40	-0.03
Nickel	209.68	21.67	20.97	2.17	22.82	4.02	-20.49	-1.69
Zinc	41.34	41.34	4.13	4.13	16.75	16.75	2.44	2.44

* Not a high quality water and assimilative capacity is not applicable.

Aluminum

The current permit does not include effluent limitations on aluminum, but the calculations in Table 2 demonstrate that there is reasonable potential for aluminum to cause or contribute to an exceedance of the chronic criterion at a flow of 1.3 MGD. The receiving water is therefore not currently a high quality for aluminum and a permit limit has been included in the draft permit based on meeting the chronic water quality criterion of 87 ug/l at the increased flow.

$$\begin{aligned} C_d &= (Q_r C_r - Q_s C_s) / Q_d \\ &= (8.84 \text{ cfs} * 87 \text{ ug/l} - 6.83 \text{ cfs} * 39 \text{ ug/l}) / 2.01 = 250.10 \text{ ug/l} \end{aligned}$$

The mass limit associated with this concentration is 2.71 lbs/day.

$$C_d = 0.250 \text{ mg/l} * 1.3 \text{ mgd} * 8.34$$

$$C_d = 2.71 \text{ lbs/day}$$

The current receiving water concentration (195.76 ug/l, see Table 3, Column Q) is less than the acute criterion of 750 ug/l and the calculations in column G of Table 2 show that the instream concentration at the increased flow (284.38 ug/l) is also less than the acute criterion. However, the higher concentration results in using more than 10 percent of the assimilative capacity (251.19 ug/l, see Column V of Table 4). Therefore EPA must consider whether the requirements of 314 CMR 4.04(5)(a) have been met, to justify a “significant increase”. In this case, EPA is unable to conclude that an instream concentration of 284.38 ug/l (based on an effluent concentration of 1118.77 ug/l) would meet the requirement of 314 CMR 4.04(5)(a)(3) that “to the maximum extent feasible, the discharge and activity are designed and conducted to minimize adverse impacts on water quality, including implementation of source reduction practices”. EPA expects that recent upgrades to the facility’s aluminum control to meet the new monthly average permit limit of 251 ug/l will substantially reduce maximum daily discharges as well. Therefore authorization of a “significant” increase of aluminum discharges with respect to the acute criterion is not justified and a maximum daily limit has been calculated to maintain discharges at or under the facility’s current loads on a maximum daily basis.

$$\begin{aligned} \text{Mass load associated with current discharge} &= C_d * Q_d * 8.34 \text{ (conversion factor)} \\ &= 1.118 \text{ mg/l} * 0.75 \text{ mgd} * 8.34 = 7.00 \text{ lb/day} \end{aligned}$$

$$\text{Permit limit to maintain mass load at 1.3 mgd} = 7.00 \text{ lb/day} / (1.3 \text{ mgd} * 8.34) = 0.646 \text{ mg/l}$$

If the Town believes that it is not feasible to meet this limit they should provide additional documentation demonstrating that (1) a less stringent limit is consistent with 314 CMR 4.04(5)(a)(3), and (2) that the requirement of 314 CMR 4.04(5)(a)(2) (“No less environmentally damaging alternative site for the activity, receptor for the disposal, or method of elimination of the discharge is reasonably available or feasible”) has also been met⁸

Zinc

The current permit does not include effluent limitations for zinc but, the receiving water is currently high

⁸ EPA notes that the requirement of “economic or social importance” (314 CMR 4.04(5)(a)(1)) is met by the CWMP approval and that water quality standards are met as required by (314 CMR 4.04(5)(a)(4)). As EPA has rejected the increase based on 314 CMR 4.04(5)(a)(3) it does not reach the question of “reasonably available or feasible” alternatives.

quality (Tier 2) for zinc according to the State's antidegradation policy. The receiving water concentration at the increased flow (19.19) is also using more than 10 percent of the assimilative capacity (16.75 ug/l, Column V, Table 4) therefore, EPA must consider whether the requirements of 314 CMR 4.04(5)(a) have been met, to justify a "significant increase".

EPA is unable to conclude that an instream concentration of 19.19 ug/l (based on an effluent concentration of 81.33 ug/l) would meet the requirements of 314 CMR 4.04(5)(a)(3) that "to the maximum extent feasible, the discharge and activity are designed and conducted to minimize adverse impacts on water quality, including implementation of source reduction practices." EPA has included a zinc limit in the permit because a "significant" increase is not justified and a permit limit has been calculated to maintain discharges at or under the facility's current loads on a maximum daily basis.

$$\begin{aligned}\text{Mass load associated with current discharge} &= \text{Cd} * \text{Qd} * 8.34 \text{ (conversion factor)} \\ &= 0.0813 \text{ mg/l} * 0.75 \text{ mgd} * 8.34 = 0.5087 \text{ lb/day}\end{aligned}$$

$$\text{Permit limit to maintain mass load at 1.3 mgd} = 0.5087 \text{ lb/day} / (1.3 \text{ mgd} * 8.34) = 0.0469 \text{ mg/l}$$

If the Town believes that it is not feasible to meet this limit they should provide additional documentation demonstrating that (1) a less stringent limit is consistent with 314 CMR 4.04(5)(a)(3), and (2) that the requirement of 314 CMR 4.04(5)(a)(2) ("No less environmentally damaging alternative site for the activity, receptor for the disposal, or method of elimination of the discharge is reasonably available or feasible") has also been met.⁹

Copper

The current permit includes copper limits based on the water quality criteria in effect at the time of issuance. Since the issuance of the current permit, MassDEP has adopted site-specific copper criteria for the Quinebaug River. These criteria, which EPA has approved, are less stringent than the previous criteria, increasing the chronic criterion to 18.1 ug/l and the acute criterion to 25.7 ug/l. As shown in Table 3, the current discharge of copper does not have reasonable potential to cause or contribute to an exceedance of the site specific water quality standards¹⁰, meaning that the receiving water is now high quality for copper according to the State's antidegradation policy; the increased discharge is considered insignificant under the Implementation Procedures (Table 4).

The limits in the current permit are a monthly average of 25 ug/l and a daily maximum of 34 ug/l. Discharge monitoring data shows that the facility consistently achieves these limits, with a maximum daily range of non-detect to 16 ug/l. The reasonable potential calculation, (column C, Table 2, Reasonable Potential Table) estimates the 95th percentile at 11 ug/l.

In the absence of a flow increase, EPA would have compared limits based on the new criteria and the performance of the facility and selected the more stringent of the two as limits, unless the performance of the facility was better than the limits based on the old criteria, in which case the existing limits would

⁹ EPA notes that the requirement of "economic or social importance" (314 CMR 4.04(5)(a)(1)) is met by the CWMP approval and that water quality standards are met as required by (314 CMR 4.04(5)(a)(4)). As EPA has rejected the increase based on 314 CMR 4.04(5)(a)(3) it does not reach the question of "reasonably available or feasible" alternatives.

¹⁰ In fact the improved performance of the facility has resulted in a situation where the discharge is not contributing to exceedances even at the (more) stringent criteria in effect at the time the current permit was issued.

have been carried forward in the draft permit. This would have been the scenario for this permit, given that the actual effluent concentrations are lower than the limits in the current permit.

However, because the river is now high quality for copper, EPA also interprets the antidegradation provisions as requiring that any increase in the instream concentration, based on the current permit limits and design flow be insignificant. To determine whether this is the case under the increased flow, EPA has calculated 10 percent of the assimilative capacity of the receiving water, using the current permit limits and the new water quality criteria, and then calculated whether the discharge, at the current effluent limits and increased flow, exceeds this threshold. If it does not, the discharge will be authorized at the current effluent limits. If it does, more stringent effluent limits will be calculated.

As can be seen by the calculations below, the increased flow causes the instream copper concentration to exceed 10 percent of the remaining acute or chronic assimilative capacity and therefore the draft permit limits have been recalculated to maintain the pollutant load in the current permit.

Instream Concentration at 0.75 mgd design flow and current permit limits

Acute:

$$\begin{aligned} Cr (0.75) &= (QdCd + QsCs) / Qr \\ &= (1.16 \text{ cfs} * 34 \text{ ug/l} + 6.83 \text{ cfs} * 1 \text{ ug/l}) / 7.99 \text{ cfs} = 5.79 \text{ ug/l} \end{aligned}$$

Chronic

$$\begin{aligned} Cr (0.75) &= (QdCd + QsCs) / Qr \\ &= (1.16 \text{ cfs} * 25 \text{ ug/l} + 6.83 \text{ cfs} * 1 \text{ ug/l}) / 7.99 \text{ cfs} = 4.5 \text{ ug/l} \end{aligned}$$

Assimilative Capacity using new water quality criteria:

Acute:

$$25.7 \text{ ug/l} - 5.79 \text{ ug/l} = 19.91 \text{ ug/l}; 10 \text{ percent} = 1.99 \text{ ug/l}$$

Chronic:

$$18.1 \text{ ug/l} - 4.5 \text{ ug/l} = 13.6 \text{ ug/l}; 10 \text{ percent} = 1.36 \text{ ug/l}$$

Instream concentration + 10 percent of assimilative capacity

$$\text{Acute} = 5.79 \text{ ug/l} + 1.99 \text{ ug/l} = 7.78 \text{ ug/l}$$

$$\text{Chronic} = 4.5 \text{ ug/l} + 1.36 \text{ ug/l} = 5.86 \text{ ug/l}$$

Instream Concentration at 1.3 mgd design flow and current permit limits

Acute:

$$\begin{aligned} Cr (1.3) &= (QdCd + QsCs) / Qr \\ &= (2.0 \text{ cfs} * 34 \text{ ug/l} + 6.8 \text{ cfs} * 1 \text{ ug/l}) / 8.8 \text{ cfs} = 8.5 \text{ ug/l} \end{aligned}$$

Chronic:

$$\begin{aligned} Cr (1.3) &= (QdCd + QsCs) / Qr \\ &= (2.0 \text{ cfs} * 25 \text{ ug/l} + 6.8 \text{ cfs} * 1 \text{ ug/l}) / 8.8 \text{ cfs} = 6.45 \text{ ug/l} \end{aligned}$$

Draft permit limits based on flow increase

Mass load associated with the current permit limits

$$(34) * (0.75) * (8.34) = 212.67 \text{ lbs/day}$$

$$(25) * (0.75) * (8.34) = 156.375 \text{ lbs/day}$$

$$C_d = 212.67 / 1.3 * 8.34 = 212.67 / 10.84 = 19.62 \text{ ug/l}$$

$$C_d = 156.38 / 1.3 * 8.34 = 156.38 / 10.84 = 14.43 \text{ ug/l}$$

Phosphorus

Phosphorus is an essential nutrient for plant growth but, excessive amounts of phosphorus in a water body has the potential to accelerate stream eutrophication, characterized by excessive plant growth, low dissolved oxygen and, large diurnal swings in dissolved oxygen in the water body.

The “French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report”, published in November 2009 by MassDEP provides water quality data for the segment of the Quinebaug River. It presents designated uses for aquatic life, aesthetics, primary and secondary recreational contact.

EPA approved the *2012 Integrated List* in March 2013 and it classifies segment MA41-02 of the Quinebaug River as impaired for excessive algal growth and turbidity. The listing requires the State to prepare a Total Maximum Daily Load (TMDL) to address nutrients in this segment of the river.

Regulatory Background

MA SWQS do not include numeric criteria for phosphorus. The Standards do include narrative criteria, including, in 314 CMR 4.05(5)(c) that states “unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 CMR 4.00. Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best practical treatment (HBPT) for POTWs and Best Available Technology (BAT) for non POTWs, to remove such nutrients to ensure protection of existing and designated uses.” MassDEP historically has defined HBPT for POTWs as a monthly average limit of 0.200 ug/l.

In the absence of numeric criteria or a TMDL, EPA interprets the narrative criteria using the procedures found at 40 CFR Part 122.44(d)(1)(vi), including the use of available guidance and other relevant information. This information would include EPA-published national guidance documents which contain recommended total phosphorus criteria and other indicators of eutrophication. The “Quality Criteria for Water 1986” document, <http://www.epa.gov/waterscience/criteria/library/goldbook.pdf> commonly known as the “Gold Book”, follows an effects-based approach and, recommends maximum threshold concentrations designed to prevent or control adverse nutrient-related impacts from occurring in-stream. The “Gold Book” document 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 a lake or reservoir.

The effects-based Gold Book threshold is a general target applicable in free-flowing streams. As the Gold Book notes, there are natural conditions of a water body that can result in either increased or reduced eutrophication response to phosphorus inputs; in some waters more stringent phosphorus reductions may be needed, while in some others a higher phosphorus threshold could be assimilated without inducing a eutrophic response. In this case, EPA is not aware of any evidence that the Quinebaug River is unusually susceptible to eutrophication impacts, so that 100 ug/l threshold appears sufficient in this receiving water. With respect to factors that can reduce susceptibility, the Gold Book identifies morphometric features (steep banks, great depths and substantial flows), limitations by nutrients other than phosphorus, reduced light penetration where waters are highly laden with natural silts or color, or other naturally occurring phenomena that limit plant growth.¹¹

More recently, EPA has released recommended Ecoregional Nutrient Criteria, 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, and thus free from the effects of cultural eutrophication. Sturbridge is located within Ecoregion XIV, Eastern Coastal Plains. The recommended total phosphorus criterion for this ecoregion, found in “Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV” http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/upload/2007_09_27_criteria_nutrient_ecoregions_rivers_rivers_14.pdf published by EPA in December 2000 is 24 ug/l (0.024 mg/l).

EPA approved, “Massachusetts Year 2012 Integrated List of Waters” in March 2013 and it classifies segment MA41-02 of the Quinebaug River as impaired for excessive algal growth. The listing requires the State to prepare a Total Maximum Daily Load (TMDL) to address nutrients in this segment of the river.

Effluent limits

The existing permit has an HBPT-based 0.2 mg/l monthly average limit for total phosphorus for the months of April through October, pursuant to 314 CMR 4.05(5)(c) of the MA SWQS, and a 1.0 mg/l monthly average limit for the months of November through March. Attachment A, Sturbridge Water Pollution Control Facility-Discharge Monitoring Data has phosphorus data from the Town’s monthly discharge monitoring reports.

The limits in the existing permit did not account for the phosphorus concentration upstream of the discharge therefore the upstream concentration has been factored into the calculation for the monthly average phosphorus limit in the draft permit.

To confirm that the existing HBPT-based total phosphorus limits meet EPA’s Gold Book Criteria of 0.100 mg/l, EPA calculated a mass balance equation to determine the total phosphorus concentration downstream of the discharge. A phosphorus concentration of 0.030 mg/l reported in the French & Quinebaug River Watersheds 2004-2008 Water Quality Assessment on page 109 for the segment of the

¹¹The Gold Book also includes waters where “technological or cost-effective limitations may help control induced pollutants”; “waters managed primarily for waterfowl or other wildlife” and waters where phosphorus control cannot be sufficiently effective under present technology to make phosphorus the limiting nutrient”. As these factors do not address water body response but instead alternative technological solutions or changes in management goals, EPA does not consider them altering the threshold necessary to meet the narrative water quality standard.

river upstream of the treatment plant was used in the mass balance equation below.

Downstream Phosphorus Concentration

First, EPA checked that the 0.200 mg/l limit meets the Gold Book criteria at the existing flow of 0.75 MGD.

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

Where

Cr = Concentration below outfall

Qd = Discharge flow = 1.16 cfs

Cd = Discharge concentration = 0.200 mg/l

Qs = Upstream flow = 6.83 cfs

Cs = Upstream concentration = 0.030 mg/l

Qr = Streamflow below outfall = 7.99 cfs (effluent + upstream)

Therefore,

$$C_r = \frac{(1.16 \times 0.200 \text{ mg/l}) + (6.83 \times 0.030 \text{ mg/l})}{7.99 \text{ cfs}} = 0.055 \text{ mg/l}$$

The mass balance equation shows that the instream concentration of phosphorus at the existing permit limit of 0.200 mg/l (1.25 lbs/day) and discharge flow of 0.75 MGD achieves the Gold Book Criteria of 0.100 mg/l. Based on this interpretation of the state's narrative criteria, the receiving water is high quality for phosphorus at the point of discharge.

EPA then considered whether a change in water quality resulting from the flow increase would use 10 percent or less of the remaining assimilative capacity. To do this, EPA calculated the instream concentration at the existing permit limit and the new design flow.

The instream concentration at a flow of 1.3 mgd and 0.200 mg/l is:

$$\begin{aligned} C_r &= (Q_d C_d + Q_s C_s) / Q_r \\ &= (2.01 \text{ cfs} \times 0.200 \text{ mg/l} + 6.83 \text{ cfs} \times .03 \text{ mg/l}) / 8.84 \\ &= 0.069 \text{ mg/l} \end{aligned}$$

The instream concentration at a discharge flow of 0.75 mgd is 0.055 mg/l, so assimilative capacity is 0.100 mg/l - 0.055 mg/l = 0.045 mg/l. Ten percent of this is 0.0045 mg/l. Adding this value to the instream concentration of 0.055 mg/l yields a total of 0.060 mg/l. In regards to antidegradation, the additional flow establishes a significant increase (greater than 10% of the assimilative capacity) in the instream concentration of phosphorus and EPA must consider whether the requirements of 314 CMR 4.04(5)(a) have been met, to justify a "significant increase". In this case, EPA is unable to conclude that an instream concentration of 0.069 mg/l would meet the requirement of 314 CMR 4.04(5)(a)(3) that "to the maximum extent feasible, the discharge and activity are designed and conducted to minimize adverse impacts on water quality, including implementation of source reduction practices." EPA has concluded that the new treatment facility, with significantly improved capability for treating phosphorus, will be capable of maintain the current permitted load for phosphorus resulting in no lowering of water quality. Therefore authorization of a "significant" increase of phosphorus discharges is not justified and a permit limit has

been calculated to maintain discharges at or under the facility's current permitted loads (1.25 lbs/day).¹²

The new concentration limit is calculated as follows:

Current permitted load (lbs/day)/ (8.34 x new design flow (MGD)) = 1.25 lbs/day/(8.34 x 1.3 MGD) = 0.12 mg/l.

This monthly average limit has been included in the draft permit for the months of April through October.

The monthly average limit in the current permit for the months of November through March is 1.0 mg/l. This limit was intended to ensure that phosphorus discharged during these months is primarily in the dissolved form, and would pass through the downstream waters during months when there is no plant growth. This limit was not calculated to achieve a particular instream concentration, so in the absence of any particular information showing the need to achieve a more stringent instream concentration, EPA has continued the 1 mg/l monthly average limit in the draft permit.

The existing permit has an ortho-phosphorus monitoring and reporting requirement from November through March that has been carried forward in the draft permit. This requirement is necessary to further understand the physical dynamics of phosphorus during the cold weather months.

Nitrogen

The monthly average and maximum daily reporting requirements for Total Kjeldahl Nitrogen, total nitrate, and, total nitrite shall remain in the draft permit. Attachment B, Sturbridge Water Pollution Control Facility-Discharge Monitoring Report Data shows data reported on these parameters between May 2012 and January 2014. A total nitrogen reporting requirement has also been included in the draft permit. The monitoring frequency for these parameters is once per week.

There are significant water quality problems in Long Island Sound due to excessive nitrogen loading and low dissolved oxygen levels. In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a Total Maximum Daily Load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a Waste Load Allocation (WLA) for point sources and a Load Allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL.

The baseline total nitrogen point source loadings estimated for the Connecticut, Housatonic, and Thames River watersheds were 21,672 lbs/day, 3,286 lbs/day, and 1,253 lbs/day respectively as shown below. The Quinebaug River is located in the Thames River watershed and the TMDL for Long Island Sound applies to facility's discharging to this river. The estimated current point source total nitrogen loadings for the Connecticut, Housatonic, and Thames Rivers respectively are 13,836 lbs/day, 2,151 lbs/day, and 1,015 lbs/day, based on recent information and including all POTWs in the watershed. The following table summarizes the estimated baseline loadings, TMDL target loadings, and estimated current loadings:

¹²As noted in connection with the Aluminum discussion above, if the facility believes that it is not feasible to meet this limit the facility should provide additional documentation demonstrating that (1) a less stringent limit is consistent with 314 CMR 4.04(5)(a)(3), and (2) that the requirement of 314 CMR 4.04(5)(a)(2) ("No less environmentally damaging alternative site for the activity, receptor for the disposal, or method of elimination of the discharge is reasonably available or feasible") has also been met.

Basin	Baseline Loading ¹ lbs/day	TMDL Target ² lbs/day	Current Loading ³ lbs/day
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,002

1. Estimated loading from TMDL, (see Appendix 3 to CT DEP “Report on Nitrogen Loads to Long Island Sound”, April 1998)
2. Reduction of 25% from baseline loading
3. Estimated current loading from 2004 – 2005 DMR data – detailed summary attached as Exhibit A, Nitrogen Loads.

The TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met, and the overall loading from MA, NH and VT wastewater treatment plants discharging to the Connecticut River watershed has been reduced by about 36 percent.

In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25 percent reduction over baseline loadings, EPA intends to include a permit condition for all existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization efforts will also be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that the aggregate 25 % reduction is maintained. Such a requirement has been included in this permit. EPA also intends to work with the State of Vermont to ensure that similar requirements are included in its discharge permits.

Specifically, the permit requires an evaluation of alternative methods of operating the existing wastewater treatment facility in order to control total nitrogen levels, including, but not limited to, operational changes designed to enhance nitrification (seasonal and year-round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. This evaluation is required to be completed and submitted to EPA and MassDEP within one year of the effective date of the permit, along with a description of past and ongoing optimization efforts. The permit also requires implementation of optimization methods sufficient to ensure that there is no increase in total nitrogen compared to the existing average daily load. The annual average total nitrogen load from this facility (2004–2005) is estimated to be 52 lbs/day. The same load will remain the same for the increased flow. The permit requires annual reports to be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years.

The agencies will annually update the estimate of all out-of-basin total nitrogen loads and may incorporate total nitrogen limits in future permit modifications or reissuances as may be necessary to address increases in discharge loads, a revised TMDL, or other new information that may warrant the incorporation of numeric permit limits. There have been significant efforts by the New England Interstate Water Pollution Control Commission (NEIWPCC) work group and others since completion of the 2000 TMDL, which are anticipated to result in revised wasteload allocations for in-basin and out-of-basin facilities. Although not a permit requirement, it is strongly recommended that any facilities planning that

might be conducted for this facility should consider alternatives for further enhancing nitrogen reduction.

Ammonia

Ammonia can reduce the receiving stream's dissolved oxygen concentration through nitrification and can be toxic to fish and aquatic wildlife at elevated levels.

The ammonia limits in the current permit are in effect during the months of June through October and include monthly average limits of 1.5 mg/l (9.4 lbs/ day) and a maximum daily limit of 2.0 mg/l. These limits were carried forward from the previous permit and are based on a MassDEP 1989 wasteload allocation. The draft permit will maintain the same mass loadings, and the concentration limits have been lowered to reflect the increase in flow. The average monthly limit from June 1 through October 31 is 0.87 mg/l (9.4 lbs/day) and the maximum daily limit is 1.2 mg/l (12.5 lbs/day). Monitoring and reporting are required for the remainder of the year.

There were no exceedances of the monthly average ammonia-nitrogen limit reported from May 2012 through January 2014. There was one exceedance of the maximum daily ammonia-nitrogen limit in July 2012.

Winter Ammonia Limits

Winter limits may be necessary to ensure that ammonia does not cause or contribute to violations of water quality standards for a Class B water. In the existing permit, the facility is required to report the ammonia concentration once per month from November 1 through May 31. The highest monthly average ammonia concentration reported on the Town's DMRs, during the cold weather season was 1.05 mg/l in April 2013. As with other pollutants, EPA reviewed the data to determine the impact of ammonia from the flow increase during the cold weather months. EPA determined the receiving water is a high quality water for ammonia. (C_r , column G, Table 7 is less than the acute and chronic criteria shown in column H, Table 7).

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

Instream ammonia criteria for the cold weather season are dependent on pH and temperature of the receiving water as explained in the 1999 Update of Ambient Water Quality Criteria for Ammonia, Volume 64, Number 245, Federal Register pages, 71973-71980. Table 5, Ammonia Criteria show pH and temperature data from recent toxicity tests used to determine the instream criteria for the cold weather season.

A receiving water 30Q10 flow of 30.6 cfs was also used to determine the need for winter ammonia limits. The 30Q10 is defined as the mean stream flow for thirty consecutive days with a ten year recurrence interval and was used to calculate cold weather water quality based limits in the draft permit.

Quinebaug River Basin estimate of 30Q 10 for period of November 1 to April 30.

$$30Q10_{\text{gage}} = 27.5 \text{ cfs}$$

$$A_{\text{gage}} = \text{Drainage area at gage} = 67.4 \text{ square miles}$$

$$A_{\text{outfall}} = \text{Drainage area at the outfall} = 75.1 \text{ square mile}$$

$$30Q10_{\text{outfall}} = 75.1 \text{ sq. mi} / 67.4 \text{ sq.mi.} * 27.5 \text{ cfs}$$

$$30Q10_{\text{outfall}} = 30.6 \text{ cfs}$$

EPA calculated the instream concentration of ammonia that would result from the discharge at 0.75 mgd, using the upstream 30Q10 flow, the pollutant concentrations, and the effluent concentrations. (See column Q, Table 8). The concentrations were subtracted from the applicable water quality criteria, giving an estimate of assimilative capacity (see Column T, Table 9). EPA then calculated 10 percent of the assimilative capacity for ammonia, added it to the calculated receiving water concentration, to arrive at an estimate of the current receiving water concentration plus 10 percent of the assimilative capacity (See Column V, Table 9). These values were then subtracted from the estimated receiving water concentration at a 1.3 mgd design flow. (See Column W, Table 9). The negative value indicates that the expected instream concentrations at the increased design flow is insignificant and a limit is not necessary for this permit reissuance. Monthly monitoring shall remain a condition of the draft permit since the data is necessary to calculate total nitrogen.

Table 5. Ammonia Criteria

Month	pH	Temp. C	Acute Criteria	Chronic Criteria
November 2011	6.6	6.7	31.3 mg/l (31300 ug/l)	6.57 mg/l (6570 ug/l)
February 2011	6.6	0	31.3 mg/l (31300 ug/l)	6.57 mg/l (6570 ug/l)

Table 6. Ammonia Data¹³

WET Tests Data	Average Ambient Ammonia as N, mg/l ¹⁴
November 2012	0.05
February 2012	0.05
November 2011	0.05
February 2011	0.05
November 2010	0.05
February 2010	0.12
November 2009	0.066
March 2009	0.11
November 2008	0.22
February 2008	0.05
Median	0.050 mg/l (50 ug/l)

¹³ Data reported in whole effluent toxicity tests.

¹⁴ The quantification limit for ammonia reported in the WET Tests are <0.1 mg/l and 0.05 mg/l. One half the quantification limit, was used when ammonia was reported as non-detect in toxicity test.

Table 7. Instream Concentration at 1.3 MGD Discharge Flow

A	B	C	D	E	F	G	H		I	J	
	Qd	Cd¹ (95th Percentile)	Qs	Cs² (Median)	Qr = Qs + Qd	Cr_{1.3} = (QdCd+QsCs) /Q_R	Criteria		Reasonable Potential	Limit = (Qr*Criteria- 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)
Ammonia	2.01	803	30.6	50	32.61	96.47	31300	6570	N	N/A	N/A

¹Values calculated using data from the reasonable potential table (see Reasonable Potential Analyses in the administrative file).

² Median upstream metals data reported in Whole Effluent Toxicity (WET) Tests on the Quinebaug River just upstream of the Sturbridge WWTF (see Attachment C, Whole Effluent Toxicity Test Chemistry Data).

Table 8. Instream Concentration at 0.75 MGD Discharge Flow

Based on 0.75 mgd (1.16 cfs)

K	L	M	N	O	P	Q	R	
		Cd (95th Percentile)		Cs (Median)	Qr = Qs + Qd	Cr_(0.75) = (QdCd+QsCs)/Q_R	Criteria	
	Qd		Qs					
	Cfs	ug/l	cfs	ug/l	cfs	ug/l	Acute (ug/l)	Chronic (ug/l)
Ammonia	1.16	803	30.6	50	31.76	77.5	31300	6570

Table 9. Assessment of Significance for Ammonia

S	T		U		V		W	
	Assimilative capacity = Criteria-Cr_(0.75)		10 percent of Assimilative capacity		Cr_(0.75) plus 10 percent of Assimilative Capacity		Cr_(1.3)- (Cr_(0.75) + 10 % of Assimilative Capacity)	
	Acute ug/l	Chronic ug/l	Acute ug/l	Chronic ug/l	Acute ug/l	Chronic ug/l	Acute ug/l	Chronic ug/l
Ammonia	31222.50	6492.50	3122.25	649.25	3199.75	726.75	-3103.28	-630.28

Whole Effluent Toxicity Testing

Under Section 301(b)(1) of the CWA, discharges are subject to effluent limitations based on water quality standards. The MA SWQS at 314 CMR 4.05(5)(e), include the following narrative statements and require that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife. For pollutants not otherwise listed in 314 CMR 4.00, the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002 published by EPA pursuant to Section 304(a) of the Federal Water Pollution Control Act, are the allowable receiving water concentrations for the affected waters, unless the Department either establishes a site specific criterion or determines that naturally occurring background concentrations are higher. Where the Department determines that naturally occurring background concentrations are higher, those concentrations shall be the allowable receiving water concentrations. Site specific limits, human health risk levels and permit limits will be established in accordance with 314 CMR 4.05(5)(e)(1)(2)(3)(4).

National studies conducted by the EPA have demonstrated that industrial and domestic sources contribute toxic constituents, such as metals, chlorinated solvents aromatic hydrocarbons, and other pollutants to POTWs. The impact of such complex mixtures is often difficult to assess. Therefore, the toxicity of several constituents in a single effluent can only be accurately examined by whole effluent toxicity testing. In addition, 40 CFR 122.44 (d) requires whole effluent toxicity limits in NPDES permits when the effluent has a reasonable potential to cause toxicity.

The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analysis; (2) bioavailability of pollutants after discharge is measured by toxicity testing including any synergistic effect of pollutants; and (3) pollutants for which there are inadequate analytical methods or criteria can be addressed. Therefore, toxicity testing is used in connection with pollutant-specific control procedures to control the discharge of toxic pollutants.

The draft permit includes acute and chronic whole effluent toxicity limitations and monitoring requirements. (See, e.g., “Policy for the Development of Water Quality Based Permit Limitations for Toxic Pollutants”, 50 Fed. Reg. 30,784-July 24, 1985. See also EPA’s Technical Support Document for Water Quality Based Toxics Control, EPA/505-90-001). The LC₅₀ limitation prohibits acute effects, lethality to more than 50% of the test organisms when exposed to POTW undiluted effluent for 48 hours. The chronic-no observed effect concentration (C-NOEC) limitation in the draft permit prohibits chronic adverse effects such as survival growth, and reproduction when aquatic organisms are exposed to the POTW discharges at the calculated available dilution.

The LC₅₀ limitation in the draft permit is 100%, consistent with MassDEP’s “Implementation Policy for the Control of Toxic Pollutants in Surface Waters”, February 23, 1990, (MassDEP’s Toxics Implementation Policy) which requires an effluent limitation of 1 toxic unit (LC₅₀ = 100%) for discharges with dilution factors less than 100.

The Chronic-No Observed Effect Concentration (C-NOEC) limitation in the draft permit prohibits chronic effects that adversely affect survival, growth, or reproduction when aquatic organisms are exposed to the POTW effluent at several different dilution concentrations. The C-NOEC is established equal to the inverse of the dilution factor consistent with MassDEP’s “Implementation Toxics Policy”. The C-NOEC is 23%

based on the flow.

$$\text{C-NOEC} = 1/\text{dilution factor} = 1/4.41 = 0.227 \text{ or } 23\%$$

Consideration of antidegradation can best be done by converting the limits to toxic units (TU). This can be done by calculating the reciprocal of the limits expressed as fractions. In this instance, the acute and chronic limits in the current permit are 1 TUa (1/1) and 6.67 TUC (1/0.15). As shown earlier, the limits that would be included in the draft permit for the increased discharge without consideration of antidegradation are an acute limit of 1 TUa and 4.4 TUC (1/0.23).

As a practical matter a lower acute limit could not be imposed without changing the test (e.g., an LC 25), and the limit generated by the policy allows the same number of toxicity units as authorized by the current permit, so there is no increase in the acute whole effluent toxicity using this limit.

For chronic toxicity, the number of toxic units that would be allowed under the policy at the increased design flow is reduced from 6.67 to 4.4, proportional to the change in the dilution factor from 6.7 to 4.4. This has the effect of maintaining the same instream chronic toxicity as authorized in the current permit.

Accordingly, the draft permit includes an LC50 limit of 100 percent effluent and a chronic limit of 23 percent effluent.

This draft permit requires four toxicity tests per year for the fathead minnows, (*Pimephales promelas* and the daphnids, (*Ceriodaphnia dubia*) in February, May, August and, November using the protocols specified in Attachment A, Freshwater Chronic Toxicity Test Procedure and Protocol and Attachment A-1 Freshwater Acute Toxicity Test Procedure and Protocol of the draft permit.

The permittee may request a reduction in the WET testing requirements as noted in footnote 10 of the draft permit when compliance with a **minimum** of four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits is achieved.

Test results for the whole effluent toxicity tests are shown below for 2012 and 2013.

Table 10. Whole Effluent Toxicity Tests Results

Date	C-NOEC Pimphales	LC50–Acute Pimephales
November 2013	100%	100%
August 2013	100%	100%
May 2013	15%	100%
February 2013	15%	100%
November 2012	15%	100%
August 2012	100%	100%
May 2012	100%	100%
February 2012	100%	100%

Sludge Information and Requirements

Section 405(d) of the CWA requires that sludge conditions be included in all municipal permits. The sludge conditions in the draft permit satisfy this requirement and are taken from EPA's Standards for the Disposal of Sewage Sludge codified at 40 CFR Part 503 (February 6, 1989-54 FR 5746). The pollutants listed are those which are to be limited by 40 CFR Part 503. EPA regional sludge guidance document is available at <http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf> as a reference to assist the permittee in determining the applicable sludge requirements in the draft permit.

Waste activated sludge generated at the Sturbridge WPCF is concentrated to 3% to 6% solids by a sludge belt thickener before it is sent off-site for incineration to Cranston WPCF in Rhode Island. In 2013, the monthly average sludge generated at the Sturbridge WPCF was 27 tons.

Sewer System Operation and Maintenance

EPA regulations set forth a standard condition for "Proper Operation and Maintenance" that is included in all NPDES permits. *See* 40 CFR § 122.41(e). This condition is specified in Part II.B.1 (General Conditions) of the draft permit and it requires the proper operation and maintenance of all wastewater treatment systems and related facilities installed or used to achieve permit conditions.

EPA regulations also specify a standard condition to be included in all NPDES permits that specifically imposes on permittees a "duty to mitigate." *See* 40 CFR § 122.41(d). This condition is specified in Part II. B. General Conditions of the draft permit and it requires the permittees to take all reasonable steps which in some cases may include operations and maintenance work to minimize or prevent any discharge in violation of the permit which has the reasonable likelihood of adversely affecting human health or the environment.

Proper operation of collection systems is critical to prevent blockages and equipment failures that would cause overflows of the collection system (sanitary sewer overflows, or SSOs), and to limit the amount of non-wastewater flow entering the collection system (inflow and infiltration or I/I). I/I in a collection system can pose a significant environmental problem because it may displace wastewater flow and thereby cause, or contribute to causing, SSOs. Moreover, I/I could reduce the capacity and efficiency of the treatment plant and cause bypasses of secondary treatment. Therefore, reducing I/I will help to minimize any SSOs and maximize the flow receiving proper treatment at the treatment plant. MassDEP has stated that the inclusion in NPDES permits of I/I control conditions is a standard State Certification requirement under Section 401 of the CWA and 40 CFR § 124.55(b).

Therefore, specific permit conditions have been included in Part I.B. and I.C. of the draft permit. These requirements include mapping of the wastewater collection system, preparing and implementing a collection system operation and maintenance plan, reporting unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling infiltration and inflow to the extent necessary to prevent SSOs and I/I related-effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary. These requirements are intended to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment.

Several of the requirements in this section of the draft permit are not included in the current permit, including collection system mapping, and preparation of a collection system operation and maintenance plan. EPA has determined that these additional requirements are necessary to ensure the proper operation and maintenance of all wastewater treatment systems and related facilities.

V. Unauthorized Discharges

This permit only authorizes the discharge of treated effluent from outfall 001. Other discharges of wastewater, such as pump station emergency overflows or sanitary sewer overflows must be reported in accordance with reporting requirements found in Section D.1.e of Part II of the permit (24-hour reporting), including requirements for both oral notice within 24 hours and written notice within 5 days.

VI. Essential Fish Habitat Determination

“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 Service (NMFS) if EPA’s actions or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish habitat, such as: waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity (16 U.S.C. § 1802(10)). “Adversely impact” means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. § 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 of actions. Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. §1855(b)(1)(A)) EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. **The Quinebaug River is not covered by the EFH designation for riverine systems and thus EPA has determined that EFH consultation with NMFS is not required.**”

VII. Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants (“listed species”) and habitat of such species that have been designated as critical (a “critical habitat”). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure 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 United States Fish and Wildlife Service (USFWS) administer Section 7 consultations for freshwater species. The National Marine Fisheries Service (NOAA Fisheries) administers Section 7 consultations for marine species and anadromous fish.

EPA and the MassDEP have determined that an ESA consultation is not required for this discharge, since no listed species or critical habitats are located in an area that could be affected by the facility’s discharge.

VIII. Monitoring and Reporting

The effluent monitoring requirements 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 requires the permittee to report monitoring results obtained during each calendar month in the Discharge Monitoring Reports (DMRs) no later than the 15th day of the month following the completed reporting period.

The Draft Permit includes new provisions related to electronic DMR submittals to EPA and the State. The Draft Permit requires that, no later than six months after the effective date of the permit, the permittee submit all DMRs 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”).

In the interim (until six months from the effective date of the permit), the permittee may either submit monitoring data to EPA in hard copy form, or report electronically using NetDMR.

NetDMR is a national web-based tool for regulated Clean Water Act permittees to submit DMRs electronically via a secure Internet application to U.S. 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 the following url: <http://www.epa.gov/netdmr>. Further information about NetDMR can be found on the EPA Region 1 NetDMR website located at <http://www.epa.gov/region1/npdes/netdmr/index.html>.

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 learn more about upcoming trainings, please visit the EPA Region 1 NetDMR website <http://www.epa.gov/region1/npdes/netdmr/index.html>.

The Draft Permit also includes an “opt-out” request process. Permittees who believe they can not 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 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.

In most cases, reports required under the permit shall be submitted to EPA as an electronic attachment through NetDMR, subject to the same six month time frame and opt-out provisions as identified for NetDMR. Certain exceptions are provided in the permit such as for the submittal of pre-treatment reports and for providing written notifications required under the Part II Standard Permit Conditions. Once a permittee begins submitting reports to EPA using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees must continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

IX. State Certification Requirements

EPA may not issue a permit unless the MassDEP with jurisdiction over the receiving water 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. The staff of MassDEP have reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

X. Public Comment Period and, Procedures for Final Decision

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 the United States Environmental Protection Agency, 5 Post Office Square-Suite 100, Mailcode OEP06-1, Boston, Massachusetts 02109-3912. 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 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.

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.

XI. EPA and MassDEP Contacts

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Betsy Davis
US Environmental Protection Agency
5 Post Office Square – Suite 100
Mailcode: OEP06-1
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1576
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Ken Moraff, Director
Office of Ecosystems Protection
U.S. Environmental Protection Agency

Attachment A of the Fact Sheet*
Sturbridge Water Pollution Control Facility
Summary of NPDES Permit Reporting Requirements

Permit Page	Requirement and Dates	Submit to:
6	Whole Effluent Toxicity Tests results are due March 31, June 30, September 30 and December 31.	EPA/MassDEP
9	The permittee shall develop and implement a plan to control I/I to the separate sewer system. The plan shall be submitted to EPA and MassDEP six months from the effective date of the permit. See Part 1.C.3.	MassDEP
11	A summary report of activities related to the implementation of the Collection System O & M Plan for the previous calendar year by March 31 each year.	EPA/MassDEP
13	The permittee shall submit an annual report with information specified in the sludge section of the permit by February 19.	EPA/MassDEP
13	The permittee shall submit a report of the evaluation on nitrogen optimization at the facility within six months of the effective date of the permit.	EPA/MassDEP
14	The permittee shall submit an annual report with information specified in the nitrogen optimization section of the permit by April 1.	EPA/MassDEP
14-16	Monitoring results obtained during the previous month shall be summarized for each month and reported on separate Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the month following the effective date of the permit. Monitoring results and reports shall be submitted electronically using NetDMR, no later than six months from the effective date of the permit (unless there is a reasonable basis that precludes the use of NetDMR as described in Section G, Monitoring and Reporting of the permit).	EPA/MassDEP

* If there is any difference between the information in this attachment and the permit, the terms and conditions in the permit are the effective requirement.

Attachment B. Sturbridge Water Pollution Control Facility-Discharge Monitoring Report Data

MONITORING PERIOD END DATE	Flow (Mgal/d)	Flow (Mgal/d)	BOD/CBOD, 05 day, (mg/l)		BOD/CBOD, 05 day, (mg/l)		BOD, 5- day, percent removal
	Annual Average	Daily Maximum	Daily Maximum	Daily Maximum	Monthly Average	Monthly Average	Monthly Minimum
5/31/2012	0.562	0.615	*****	2	*****	2	99.19
6/30/2012	0.554	0.712	*****	2	*****	2	99.30
7/31/2012	0.543	0.554	*****	2	*****	2	99.19
8/31/2012	0.535	0.594	*****	2	*****	2	99.22
9/30/2012	0.530	0.593	*****	2	*****	2	99.22
10/31/2012	0.528	0.588	2	*****	2	*****	99.23
11/30/2012	0.527	0.631	2	*****	2	*****	99.20
12/31/2012	0.527	0.696	12	*****	4	*****	98.36
1/31/2013	0.509	0.577	2	*****	2	*****	99.27
2/29/2013	0.467	0.739	2	*****	2	*****	99.11
3/31/2013	0.512	0.890	3	*****	0	*****	99.02
4/30/2013	0.516	0.691	*****	2	*****	2	99.05
5/31/2013	0.496	0.529	*****	2	*****	2	99.24
6/30/2013	0.505	1.031	*****	2	*****	2	99.09
7/31/2013	0.513	0.618	*****	2	*****	2	99.16
8/31/2013	0.533	0.624	*****	2	*****	2	99.20
9/30/2013	0.531	0.635	*****	2	*****	2	99.24
10/31/2013	0.512	0.594	2	*****	2	*****	99.30
11/30/2013	0.508	0.602	2	*****	2	*****	99.30
12/31/2013	0.507	0.682	2	*****	2	*****	99.00
1/31/2014	0.556	0.657	4	*****	2	*****	98.38
2006 Draft Permit	0.75	Report	30	15	20	10.	85.00
Minimum	0.467	0.53	2.00	2.00	0.04	2.00	98.36
Maximum	0.562	1.03	12.00	2.00	4.13	2.00	99.30
Average	0.522	0.66	3.30	2.00	2.02	2.00	99.11
Standard Deviation	0.02	0.12	3.13	0.00	0.96	0.00	0.26
# Measurements	21.00	21.00	10.00	11.00	10.00	11.00	21.00
# Exceeds Limits	0		0	0	0	0	0
***** reporting not required							

Attachment B. Sturbridge Water Pollution Control Facility-Discharge Monitoring Report Data

MONITORING PERIOD END DATE	Dissolved Oxygen (mg/l)*	pH (s.u.)	pH (s.u.)	Fecal Coliform, 400/100mL*	Fecal Coliform, 200/100mL*	Total Residual Chlorine (mg/l)*	Total Residual Chlorine (mg/l)*
	Daily Minimum	Minimum	Maximum	Daily Maximum	Monthly Average	Daily Maximm	Monthly Average
5/31/2012	6.84	6.99	7.86	40	10	40	20
6/30/2012	6.21	7.15	7.46	10	10	30	17
7/31/2012	6.24	7.29	7.61	20	11	30	14
8/31/2012	6.20	7.08	7.56	10	10	30	13
9/30/2012	6.27	7.28	7.59	10	10	30	15
10/31/2012	6.21	7.23	7.52	10	10	40	17
11/30/2012	*****	7.16	7.41	*****	*****	*****	*****
12/31/2012	*****	7.17	7.47	*****	*****	*****	*****
1/31/2013	*****	6.96	7.42	*****	*****	*****	*****
2/29/2013	*****	7.02	7.39	*****	*****	*****	*****
3/31/2013	*****	6.56	7.43	*****	*****	*****	*****
4/30/2013	*****	7.11	7.87	10	10	60	22
5/31/2013	9.11	7.20	7.62	10	10	50	23
6/30/2013	7.56	7.22	7.56	10	10	40	23
7/31/2013	7.92	7.24	7.50	10	10	40	28
8/31/2013	7.54	6.77	7.53	10	10	40	27
9/30/2013	7.57	6.97	7.68	10	10	40	28
10/31/2013	7.59	7.19	8.10	20	11	70	23
11/30/2013	7.33	7.21	7.53	*****	*****	*****	*****
12/31/2013		7.00	7.45	*****	*****	*****	*****
1/31/2014		6.88	7.38	*****	*****	*****	*****
2006 Draft Permit	6.00	6.50	8.50	400	200	129	75
Minimum	4.20	6.56	7.38	10.00	10.00	30.00	12.90
Maximum	10.80	7.29	8.10	40.00	11.10	70.00	28.10
Average	7.60	7.08	7.57	13.85	10.15	41.54	20.72
Standard Deviation	1.28	0.18	0.18	8.70	0.36	12.14	5.29
# Measurements	60.00	21.00	21.00	13.00	13.00	13.00	13.00
# Exceeds Limits	0	0	0	0	0	0	0
* seasonal monitoring and reporting only				***** reporting not required			

Attachment B. Sturbridge Water Pollution Control Facility-Discharge Monitoring

MONITORING PERIOD END DATE	Copper, Total (ug/l)	Total Suspended Solids (TSS) (mg/l)				TSS percent removal
	Monthly Average	Daily Maximm	Daily Maximm	Monthly Average	Monthly Average	Monthly Minimum
5/31/2012	0.0	*****	34.21	*****	3.7	98.34
6/30/2012	0.0	*****	1.79	*****	.9	99.54
7/31/2012	0.0	*****	2.3	*****	.96	99.32
8/31/2012	0.0	*****	1.96	*****	.95	99.49
9/30/2012	0.0	*****	3.66	*****	2.33	98.91
10/31/2012	5.0	6.21	*****	2.37	*****	98.6
11/30/2012	6.0	2.97	*****	1.71	*****	99.01
12/31/2012	5.0	17.07	*****	2.66	*****	98.47
1/31/2013	5.0	4.14	*****	2.54	*****	98.73
2/29/2013	2.6	5.86	*****	3.59	*****	98.12
3/31/2013	5.0	23.1	*****	4.45	*****	97.48
4/30/2013	5.0	*****	2.97	*****	1.86	99.24
5/31/2013	0.0	*****	3.93	*****	1.8	99.41
6/30/2013	5.0	*****	5.31	*****	2.14	99.53
7/31/2013	5.0	*****	7.9	*****	2.71	99.02
8/31/2013	5.7	*****	3.7	*****	1.39	99.66
9/30/2013	5.0	*****	20.4	*****	2.54	99.3
10/31/2013	14.0	2.34	*****	1.51	*****	99.6
11/30/2013	5.0	6.41	*****	3.96	*****	99.
12/31/2013	5.0	8.	*****	3.58	*****	98.2
1/31/2014	16.0	9.52	*****	7.31	*****	95.87
2006 Draft Permit	25	30.00	15.00	20.00	10.00	85.00
Minimum	0.00	2.34	1.79	1.51	0.90	95.87
Maximum	16.00	23.10	34.21	7.31	3.70	99.66
Average	4.49	8.56	8.01	3.37	1.93	98.80
Standard Deviation	4.21	6.60	10.17	1.68	0.87	0.89
# Measurements	21.00	10.00	11.00	10.00	11.00	21.00
# Exceeds Limits	0	0	2	0	0	0
***** reporting not required						

Attachment B. Sturbridge Water Pollution Control Facility-Discharge Monitoring Report Data					
MONITORING PERIOD END DATE	Phosphorus, Total, mg/l	Phosphorus, Total, mg/l*	Phosphorus, Total, mg/l	Orthophosphosphate, Total, mg/l	Nitrogen Ammonia, Total, mg/l
	Monthly Average	Daily Maximum	Monthly Average	Monthly Average	Monthly Average
5/31/2012	.11	*****	*****	*****	*****
6/30/2012	.05	*****	*****	*****	0.10
7/31/2012	.08	*****	*****	*****	0.18
8/31/2012	.1	*****	*****	*****	0.08
9/30/2012	.04	*****	*****	*****	0.01
10/31/2012	.05	*****	*****	*****	0.00
11/30/2012	*****	0.07	0.05	0.03	*****
12/31/2012	*****	0.13	0.07	0.02	*****
1/31/2013	*****	0.25	0.10	0.02	*****
2/29/2013	*****	0.30	0.11	0.02	*****
3/31/2013	*****	0.12	0.05	0.02	*****
4/30/2013	*****	*****	*****	0.11	*****
5/31/2013	.03	*****	*****	*****	*****
6/30/2013	.03	*****	*****	*****	0.10
7/31/2013	.02	*****	*****	*****	0.01
8/31/2013	.07	*****	*****	*****	0.10
9/30/2013	.1	*****	*****	*****	0.10
10/31/2013	.06	*****	*****	*****	0.24
11/30/2013	.02	0.32	0.12	0.11	*****
12/31/2013		0.89	0.37	0.04	*****
1/31/2014		1.01	0.67	0.32	*****
2006 Draft Permit	0.20	1.50	1.00	Report	1.50
Minimum	0.02	0.07	0.05	0.02	0.00
Maximum	0.11	1.01	0.67	0.32	0.24
Average	0.06	0.39	0.19	0.08	0.09
Standard Deviation	0.03	0.36	0.22	0.10	0.08
# Measurements	13.00	8.00	8.00	9.00	10.00
# Exceeds Limits	0	0	0		0
* seasonal monitoring and reporting only			***** reporting not required		

Attachment B. Sturbridge Water Pollution Control Facility-Discharge Monitoring Report Data

MONITORING PERIOD END DATE	Nitrogen Ammonia, Total, mg/l*	Nitrogen Ammonia, Total, mg/l*	Nitrogen Ammonia, Total, mg/l*	Nitrogen, Nitrite, mg/l	Nitrogen Nitrate mg/l	Total, Kjeldahl, mg/l
	Monthly Average	Maximum Daily	Maximum Daily	Maximum Daily	Monthly Average	Maximum Daily
5/31/2012	0.05	*****	0.10	.007	6.6	.2
6/30/2012	*****	0.10	*****	.01	1.96	.6
7/31/2012	*****	10.00	*****	.016	1.54	.9
8/31/2012	*****	0.40	*****	.035	.14	.8
9/30/2012	*****	0.01	*****	.011	1.2	1.
10/31/2012	*****	0.00	*****	.02	1.74	.8
11/30/2012	0.00	*****	0.00	.06	1.54	.8
12/31/2012	0.01	*****	0.10	.02	1.05	.8
1/31/2013	0.20	*****	0.20	.02	.96	1.3
2/29/2013	0.10	*****	1.10	.03	1.12	1.9
3/31/2013	0.30	*****	0.30	.04	3.95	.6
4/30/2013	1.05	*****	1.60	.011	5.22	1.7
5/31/2013	0.10	*****	0.10	.035	1.07	1.5
6/30/2013	*****	0.10	*****	.08	1.43	1.4
7/31/2013	*****	0.01	*****	.011	8.77	.06
8/31/2013	*****	0.10	*****	.007	1.06	.1
9/30/2013	*****	0.10	*****	.007	5.63	.6
10/31/2013	*****	0.50	*****	.206	6.1	.3
11/30/2013	0.12	*****	0.16	.001	3.13	.6
12/31/2013	0.50	*****	0.50	.02	3.3	1.2
1/31/2014	0.10	*****	0.10	.01	11.95	.1
2006 Draft Permit	Report	2.00	Report	Report	Report	Report
Minimum	0.00	0.00	0.00	0.00	0.14	0.06
Maximum	1.05	10.00	1.60	0.21	11.95	1.90
Average	0.23	1.13	0.39	0.03	3.31	0.82
Standard Deviation	0.31	3.12	0.51	0.04	3.05	0.53
# Measurements	11.00	10.00	11.00	21.00	21.00	21.00
# Exceeds Limits	0	1				
* seasonal monitoring and reporting only			***** reporting not required			

Attachment C - Effluent and Ambient Hardness Data
Sturbridge WWTP, MA0100421

Hardness-Effluent

Date	Sample 1	Sample 2	Sample 3	Average
11/1/2013	130	150	150	143.33
8/1/2013	120	130	120	123.33
5/1/2013	120	130	140	130.00
2/1/2013	120	130	100	116.67
11/1/2012	110	110	110	110.00
8/1/2012	140	150	150	146.67
5/1/2012	110	120	120	116.67
2/1/2012	100	110	110	106.67
11/1/2011	86	84	86	85.33
8/1/2011	130	120	110	120.00
5/1/2011	120	130	120	123.33
Median	120	130	120	120.00

Hardness-Ambient

Date	Sample 1	Sample 2	Sample 3	Average
11/1/2013	21	22	21	21.33
8/1/2013	18	18	18	18
5/1/2013	21	21	21	21
2/1/2013	21	21	18	20
11/1/2012	22	22	21	21.67
8/1/2012	22	22	21	21.67
5/1/2012	19	19	19	19.00
2/1/2012	18	18	18	18.00
11/1/2011	16	16	15	24.00
8/1/2011	20	18	16	23.33
5/1/2011	20	20	18	19.33
2/1/2011	21	23	22	22.00
11/1/2010	24	23	21	22.67
8/1/2010	23	24	23	23.33
5/1/2010	19	20	19	19.33
2/1/2010	20	19	20	19.67
Median	20	20	19.5	21.17

Attachment D - Whole Effluent Toxicity Test Chemistry Data
Sturbridge WWTP, MA0100421

Metals-Quinebaug River Water *, ug/l

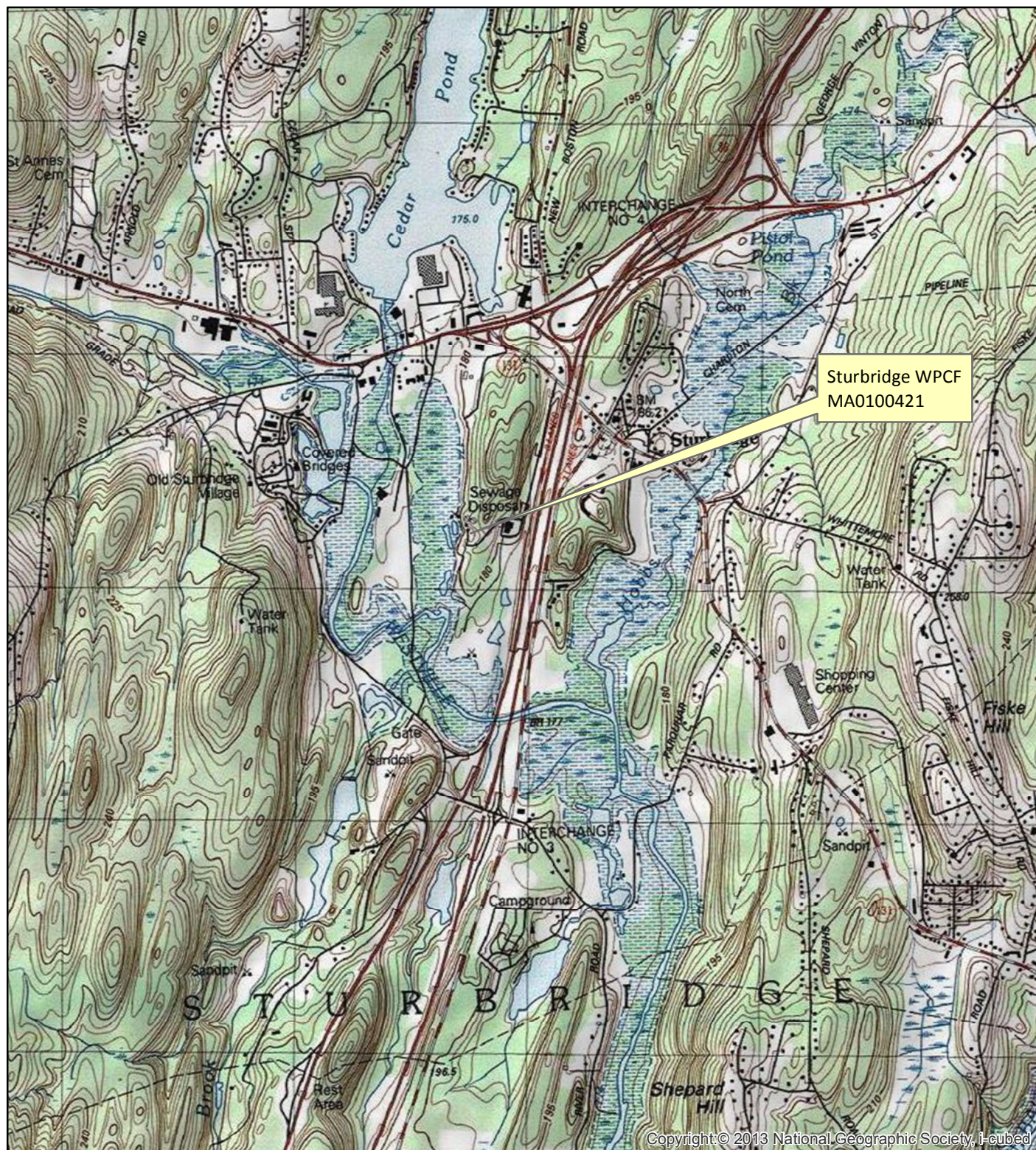
Date	Aluminum	Cadmium	Copper	Lead	Nickel	Zinc
11/1/2013	33	ND/<0.5	ND/<2	ND/<0.5	ND/<2	ND/<2
8/1/2013	31	ND/<0.5	ND/<2	ND/<0.5	ND/<2	ND/<2
5/1/2013	39	ND/<0.5	12	ND/<0.5	ND/<2	3
2/1/2013	42	ND/<0.5	ND/<2	ND/<0.5	ND/<2	18
11/1/2012	33	ND/<0.5	ND/<2	ND/<0.5	ND/<2	ND/<2
8/1/2012	28	ND/<0.5	3	ND/<0.5	ND/<2	ND/<2
5/1/2012	50	ND/<0.5	ND/<2	ND/<0.5	ND/<2	ND/<2
2/1/2012	39	ND/<0.5	ND/<2	ND/<0.5	ND/<2	1.25
11/1/2011	41	ND/<0.5	ND/<2	0.6	ND/<2	2.5
8/1/2011	48	ND/<0.5	7	ND/<0.5	ND/<2	3
5/1/2011	41	ND/<0.5	ND/<2	ND/<0.5	ND/<2	ND/<2
Median**	39	0.25	1	0.25	1	1

Metals-Treatment Plant Effluent, ug/l

Date	Aluminum	Cadmium	Copper	Lead	Nickel	Zinc
11/1/2013	120	ND/<0.5	3	0.6	3	70
8/1/2013	62	ND/<0.5	3	0.5	3	50
5/1/2013	75	ND/<0.5	ND/<2	ND/<0.5	2	38
2/1/2013	170	ND/<0.5	ND/<2	ND/<0.5	2	72
11/1/2012	70	ND/<0.5	6	ND/<0.5	3	33
8/1/2012	88	ND/<0.5	5	0.6	ND/<2	49
5/1/2012	4300	ND/<0.5	4	ND/<0.5	ND/<2	35
2/1/2012	69	ND/<0.5	4	ND/<0.5	ND/<2	46
11/1/2011	56	ND/<0.5	3	ND/<0.5	ND/<2	28
8/1/2011	10	ND/<0.5	5	ND/<0.5	6	16
5/1/2011	10	ND/<0.5	6	0.5	6	22
Median**	70	0.25	4	0.25	2.5	38

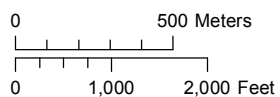
* Quinebaug River Water is collected upstream of the discharge pipe.

**The Median is calculated using the entire data set for each metal. Metals reported below the minimum detection level are written as ND/<0.5 or ND/<2 and one half the minimum detection level (0.25 and 1) is to used calculate the median.



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Scale 1 : 24,000



Regulated Facilities: EPA

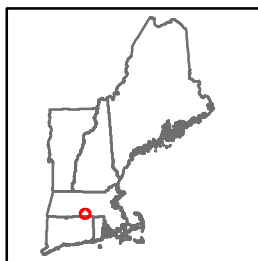


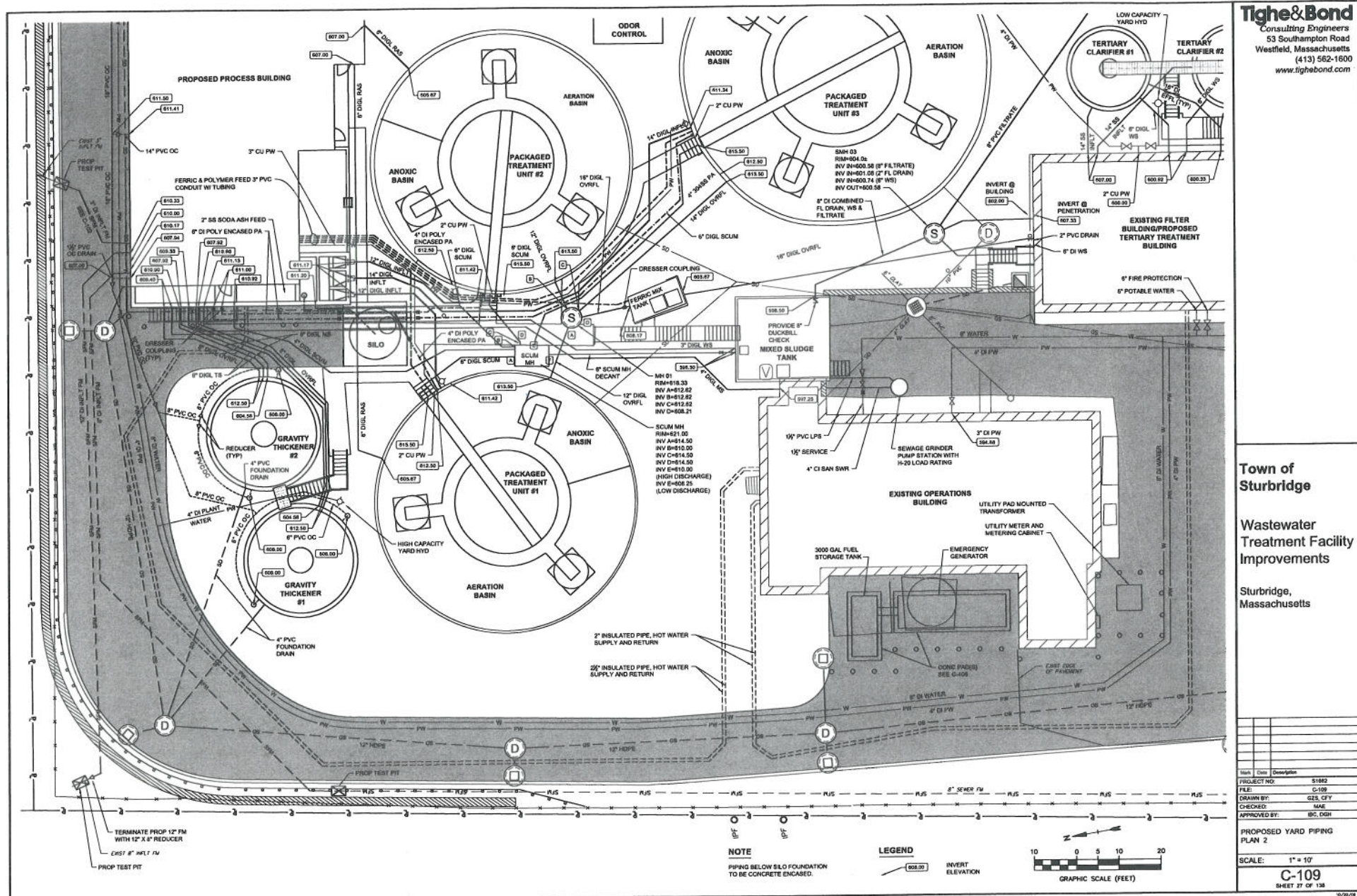
FIGURE 1 **Sturbridge WPCF** **MA0100421**

Sturbridge, MA



4/15/2014

Figure 2. WWTP Flow Process Diagram



**Exhibit A
Nitrogen Loads**

NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)¹	AVERAGE FLOW (MGD)²	TOTAL NITROGEN (mg/l)³	TOTAL NITROGEN - Existing Flow(lbs/day)⁴
NEW HAMPSHIRE					
Bethlehem Village District	NH0100501	0.340	0.220	19.600	35.962
Charlestown WWTF	NH0100765	1.100	0.360	19.600	58.847
Claremont WWTF	NH0101257	3.890	1.610	14.060	188.789
Colebrook WWTF	NH0100315	0.450	0.230	19.600	37.597
Groveton WWTF	NH0100226	0.370	0.290	19.600	47.405
Hanover WWTF	NH0100099	2.300	1.440	30.000	360.288
Hinsdale WWTF	NH0100382	0.300	0.300	19.600	49.039
Keene WWTF	NH0100790	6.000	3.910	12.700	414.139
Lancaster POTW	NH0100145	1.200	1.080	8.860	79.804
Lebanon WWTF	NH0100366	3.180	1.980	19.060	314.742
Lisbon WWTF	NH0100421	0.320	0.146	19.600	23.866
Littleton WWTF	NH0100153	1.500	0.880	10.060	73.832
Newport WWTF	NH0100200	1.300	0.700	19.600	114.425
Northumberland Village WPCF	NH0101206	0.060	0.060	19.600	9.808
Sunapee WPCF	NH0100544	0.640	0.380	15.500	49.123
Swanzey WWTP	NH0101150	0.167	0.090	19.600	14.712
Troy WWTF	NH0101052	0.265	0.060	19.600	9.808
Wasau Paper (industrial facility)	NH0001562		5.300	4.400	194.489
Whitefield WWTF	NH0100510	0.185	0.140	19.600	22.885
Winchester WWTP	NH0100404	0.280	0.240	19.600	39.231
Woodsville Fire District	NH0100978	0.330	0.230	16.060	30.806
New Hampshire Total		24.177	19.646		2169.596

VERMONT					
Bellows Falls	VT0100013	1.405	0.610	21.060	107.141
Bethel	VT0100048	0.125	0.120	19.600	19.616
Bradford	VT0100803	0.145	0.140	19.600	22.885
Brattleboro	VT0100064	3.005	1.640	20.060	274.373
Bridgewater	VT0100846	0.045	0.040	19.600	6.539
Canaan	VT0100625	0.185	0.180	19.600	29.424
Cavendish	VT0100862	0.155	0.150	19.600	24.520
Chelsea	VT0100943	0.065	0.060	19.600	9.808
Chester	VT0100081	0.185	0.180	19.600	29.424
Danville	VT0100633	0.065	0.060	19.600	9.808
Lunenburg	VT0101061	0.085	0.080	19.600	13.077
Hartford	VT0100978	0.305	0.300	19.600	49.039
Ludlow	VT0100145	0.705	0.360	15.500	46.537
Lyndon	VT0100595	0.755	0.750	19.600	122.598
Putney	VT0100277	0.085	0.080	19.600	13.077
Randolph	VT0100285	0.405	0.400	19.600	65.386
Readsboro	VT0100731	0.755	0.750	19.600	122.598
Royalton	VT0100854	0.075	0.070	19.600	11.442
St. Johnsbury	VT0100579	1.600	1.140	12.060	114.662

Templeton	MA0100340	2.800	0.400	26.400	88.070
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NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD) ¹	AVERAGE FLOW (MGD) ²	TOTAL NITROGEN (mg/l) ³	TOTAL NITROGEN - Existing Flow(lbs/day) ⁴
Ware	MA0100889	1.000	0.740	9.400	58.013
Warren	MA0101567	1.500	0.530	14.100	62.325
Westfield	MA0101800	6.100	3.780	20.400	643.114
Winchendon	MA0100862	1.100	0.610	15.500	78.855
Woronoco Village	MA0103233	0.020	0.010	19.600	1.635
Massachusetts Totals		166.010	106.950		9938.820

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 13,836 lbs/day

MA (41 facilities) = 9,939 lbs/day (72%)

VT (32 facilities) = 1,727 lbs/day (12%)

NH (21 facilities) = 2,170 lbs/day (16%)

TMDL Baseline Load = 21,672 lbs/day

TMDL Allocation = 16,254 lbs/day (25% reduction)

MA Discharges to Thames River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD) ¹	AVERAGE FLOW (MGD) ²	TOTAL NITROGEN (mg/l) ³	TOTAL NITROGEN - Existing Flow(lbs/day) ⁴
MASSACHUSETTS					
Charlton	MA0101141	0.450	0.200	12.700	21.184
Leicester	MA0101796	0.350	0.290	15.500	37.488
Oxford	MA0100170	0.500	0.230	15.500	29.732
Southbridge	MA0100901	3.770	2.900	15.500	374.883
Sturbridge	MA0100421	0.750	0.600	10.400	52.042
Webster	MA0100439	6.000	3.440	17.400	499.199
Massachusetts Totals		11.820	7.660		1014.528

1. Design flow -- typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 -- 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 1014.528 lbs/day

TMDL Baseline Load = 1,253 lbs/day

TMDL Allocation = 939 lbs/day (25% reduction)

**RESPONSE TO COMMENTS
NPDES PERMIT NO. MA0100421
STURBRIDGE WATER POLLUTION CONTROL FACILITY
STURBRIDGE, MASSACHUSETTS**

(EPA-New England) and the Massachusetts Department of Environmental Protection (MassDEP) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the Sturbridge Water Pollution Control Facility (Sturbridge WPCF), Sturbridge MA.

On August 5, 2014, consultants to the Town of Sturbridge submitted comments via email on the Town's draft Permit to EPA Region 1. These comments were filed after the close of the 30 day public comment period. EPA is not obligated to respond to comments that are provided subsequent to the close of a public comment period. EPA responded to the comments and they are part of the administrative record. EPA determined that the comments did not raise any substantial new questions concerning the Sturbridge WPCF permit. EPA found the comments informative, and made minor adjustments to the final permit based on the comments.

The final permit, essentially the same as the draft permit that was available for public comment, has been adjusted slightly to include a compliance schedule to achieve the zinc limit and to achieve compliance with the new *E.Coli* limits.

A copy of the final permit and this response to comment document will be posted on the EPA Region 1 web site: http://www.epa.gov/region1/npdes/permits_listing_ma.html.

A copy of the final permit may also be obtained by writing or calling Betsy Davis, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1576.

Changes from the draft permit to the final permit

Page 5 of 18: footnote #6 of the Final Permit now reads,

“ Fecal coliform bacteria discharges shall not exceed a monthly geometric mean of 200 colony forming units (cfu) per 100 ml, nor shall they exceed 400 cfu per 100 ml as a daily maximum. The monthly average limit for *E. coli* is expressed as a geometric mean and *E.coli* discharges shall not exceed a monthly geometric mean of 126 cfu per 100 ml, nor shall they exceed 409 cfu per 100 ml as a daily maximum.

The fecal coliform bacteria limits and monitoring requirements are in effect only for the duration of the first seasonal monitoring period of April 1 through October 31 following the effective date of the permit. For example, if the permit becomes effective on October 1, 2014, the fecal coliform limits and monitoring requirements will be in effect April through October 2015.

The *E. coli* monitoring requirements are in effect upon the effective date of the permit. The *limits* become effective on the April 1 following the end of the period in which the fecal coliform limits are effective. For example, if the permit becomes effective on October 1, 2014, the permittee shall monitor *E.coli* beginning in October 1, 2014, but the *limits* will not become effective until April 1,

2016. The monitoring frequency for *E. coli* before the limits go into effect is 1/month. After the limits are in effect, the monitoring frequency is 2/week.”

(See Response to Comment # 2.)

Page 14 of 18 in the Final Permit: A 24-month compliance schedule has been added to the final permit for achieving the zinc effluent limit. The purpose of this schedule is to allow the Town time to characterize sources of zinc in the effluent and to analyze alternative treatment for meeting the limit. The Town is required to submit a progress report in 12 months describing progress made toward attaining the zinc limit of the previous 12 months.

(See Response to Comment # 3.)

COMMENTS FROM IAN CATLOW, TIGHE AND BOND ON BEHALF OF THE TOWN OF STURBRIDGE

COMMENT #1: Public Comment Advertisement – Throughout the Town’s recent wastewater planning projects, public meetings and MEPA comment periods were noticed to the public through the Massachusetts Environmental Monitor and the Worcester Telegram & Gazette. Our experience with previous NPDES permit renewals indicates that the EPA follows a similar process of notifying the public through a legal ad in a local paper. We have been unable to locate such an advertisement in the Worcester Telegram & Gazette and request that EPA produce a copy of this ad for our records.

RESPONSE TO COMMENT #1: The public notice for the draft permit was published in the Worcester Telegram & Gazette on June 25, 2014. A copy of the legal notice is available for review in the administrative file of the permit and an electronic copy of the public notice was sent to the commenter on August 5, 2014.

COMMENT #2: E. Coli Effluent Limits – The Town appreciates the delayed implementation of the new E. Coli effluent limit and requests that the final date for E. Coli compliance be adjusted to allow for one complete disinfection season under the existing fecal coliform standard prior to implementation of the new E. Coli standard. This appears to be EPA’s intent however, given that the 2014 disinfection season is well under way we would expect that compliance with the new standard would not be required until the 2016 disinfection season, assuming a new permit is issued prior to April 1, 2015. Delays in permit issuance beyond April 1, 2015 should push implementation back further.

RESPONSE TO COMMENT #2: The *E.coli* limits, as discussed in the fact sheet, are based on a 2007 EPA approved revision to the Massachusetts State Water Quality Standards (MA SWQS). Footnote 6 in final permit has been adjusted to provide the time intended for the permittee to make the necessary treatment adjustments to meet the final permit limits.

COMMENT #3: Zinc Limit – EPA’s fact sheet indicates that there is not a zinc limit in the current permit and that according to the Fact Sheet: “EPA is unable to conclude that an in stream concentration of 19.19 ug/l would meet the requirements of 314 CMR 4.04 (5)(a)(3) that “to the maximum extent feasible, the discharge and activity are designed and conducted to minimize adverse impacts on water quality, including source reduction measures.” This statement implies that EPA has the discretion to relax effluent zinc limits in instances where adverse impacts are not documented and/or zinc optimization efforts are under way. Since zinc was not previously

regulated at the facility there is very little data regarding either effluent or in stream zinc concentrations. The Town requests that EPA modify the draft permit requirements so that instead of a new zinc limit, the next permit includes monitoring and optimization requirements to better understand zinc levels in plant effluent and the receiving water as well as likely zinc sources. This approach is scientifically prudent and represents very low environmental risk because the plant is currently producing substantially cleaner effluent under lower flow conditions than those observed prior to the recent upgrade.

RESPONSE TO COMMENT #3: EPA does not have the discretion to relax the zinc limits in the permit if the Massachusetts Water Quality Standards at 314 CMR 4.04(5) have not been met. Page 19 of the fact sheet invites the permittee to submit additional documentation to demonstrate that a less stringent limit for zinc is consistent with the 314 CMR 4.04(a)(3), “to the maximum extent feasible, the discharge and activity are designed and conducted to minimize adverse impacts on water quality, including source reduction measures.” however, the necessary documentation has not been received by EPA or MassDEP. A two year compliance schedule to achieve the limit has been added to the final permit.

COMMENT #4: Operation & Maintenance of the Sewer System (CMOM) – The CMOM requirements specified in the draft permit represent a significant and unanticipated cost to the Town. While it is clear that many of the requirements are beneficial, planning and documentation costs will need to be built into Town budgets before implementation can occur. For this reason the Town requests that EPA adjust the implementation schedule to utilize the full five year permit period for implementation.

RESPONSE TO COMMENT #4: The revised Capacity, Management, Operation and Maintenance (CMOM) language and requirements have been standard permit requirements in all NPDES permits for Publicly Owned Treatment Works (POTWs) in Massachusetts since 2011. EPA and MassDEP met with the Town and its consultants for a site visit in April 2012 to discuss the NPDES renewal process and the Agencies notified the Town and its consultants that the renewed permit would include updated CMOM requirements.

The commenter has not specified which requirements of the CMOM represent a significant and unanticipated cost for the Town or why an additional five years are necessary for implementing the CMOM requirements. Several of the requirements such as the preventative maintenance program, managing I/I and, maintaining adequate staff are requirements that were in the previous permit and which presumably have been factored into the Town’s budget for managing the POTW.

From EPA’s perspective, delaying the additional CMOM requirements for an entire five years seems unnecessary.

COMMENT #5: Nitrogen Optimization – Recent upgrades to the WWTF and the implementation of an MLE process for nitrogen removal have lead to greatly reduced nitrogen discharges over the last two years at the Sturbridge WWTF. Based on data previously submitted to EPA it is not uncommon to have days where the effluent total nitrogen load is less than 20 lbs/day. Since this is well below EPA’s 52 lb/day target the Town requests that EPA waive the requirements for performance of a nitrogen optimization study.

RESPONSE TO COMMENT #5: The Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound (the TMDL), requires an

aggregate 25% reduction in nitrogen loading from out-of-basin point sources contributing nitrogen to Long Island Sound.

As discussed in the fact sheet, to ensure the target reduction is maintained, EPA has included a reporting requirement in all wastewater treatment plants that discharge to the Connecticut, Housatonic and Thames watersheds which includes the Sturbridge WPCF.

EPA believes the recent upgrades at the treatment plant are contributing to a reduction of the nitrogen load in Long Island Sound. EPA encourages the Town to continue to optimize nitrogen removal at the treatment plant since nitrogen from POTWs is a major source of eutrophication in in freshwater and marine waters. EPA also considers it important to document and track nitrogen optimization efforts undertaken by the Town to meet the requirements of the TMDL.

COMMENT #6: Dilution Water Waiver – The Town previously went through the process of obtaining a dilution water waiver for their toxicity testing procedure which allowed the use of non-river water. Rather than repeating this effort through the new self certification process, the Town requests that the existing waiver be appended to the new permit so that the current analytical approach can continue.

RESPONSE TO COMMENT #6: The primary objective of the Whole Effluent Toxicity (WET) test is to estimate effluent toxicity in the receiving water and determine the effects of the effluent on aquatic biota. To achieve these objectives and characterize the interaction of the effluent and receiving water the preferred dilution water used in WET tests is actual river water.

Continuing the use of alternative dilution water in WET tests in a renewed permit is not automatic since the preferred dilution water to use in the tests is receiving water. EPA Regional policy authorizes the use of alternate dilution water in two scenarios: (1) in any WET test repeated due to site water toxicity. No prior notification to EPA is required for any current test that needs to be repeated due to site water toxicity; and (2) in future WET tests where there are two previously documented incidents of site water toxicity associated with a particular test species.

The 2013 WET tests indicate 100% mean survival of species in samples using receiving water. EPA suggests the Town use the self-implementing method of switching to an alternative dilution water for any WET test if, in the future, the assay data indicate the receiving water is toxic.