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 Maynard, Massachusetts

is authorized to discharge from the facility located at

Maynard Water Pollution Control Facility
18 Pine Hill Road
Maynard, MA 01754

to receiving water named

Assabet River

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

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

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

This permit supersedes the permit issued on May 26, 2005.

This permit consists of **Part I** (16 pages); **Attachment A** (Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages); **Attachment B** (Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013, 7 pages) and **Part II (**NPDES Part II Standard Conditions, April 2018, 21 pages).

Signed this 2nd day of July, 2019

/S/SIGNATURE ON FILE
Ken Moraff, Director
Water Division
Environmental Protection Agency
Region 1
Boston, MA

/S/SIGNATURE ON FILE
Lealdon Langley, Director
Division of Watershed Management
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent through Outfall Serial Number 001 to Assabet River. The discharge shall be limited and monitored as specified below; the receiving water and the influent shall be monitored as specified below.

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly[4]	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[5]
Effluent Flow[6]	1.45 MGD Rolling Average	---	---	Continuous	Recorder
Effluent Flow[6]	Report MGD	---	Report MGD	Continuous	Recorder
BOD_5	30 mg/L 363 lb/day	45 mg/L 544 lb/day	Report mg/L	2/week	Composite
BOD_5 Removal	≥ 85 %	---	---	---	---
TSS	30 mg/L 363 lb/day	45 mg/L 544 lb/day	Report mg/L	2/week	Composite
TSS Removal	≥ 85 %	---	---	---	---
pH Range[7]	6.5 - 8.3 S.U.			2/day	Grab
Total Residual Chlorine[8,9]	73 µg/L	---	126 µg/L	2/day	Grab
Escherichia coli[8,9]	126 cfu/100 mL	---	409 cfu/100 mL	3/week	Grab
Aluminum[10,11]	274 µg/L	---	---	1/month	Composite
Total Copper[12]	0.037 mg/L	---	0.053 mg/L	1/month	Composite
Dissolved Oxygen (April 1 - October 31)	≥ 5.0 mg/L			1/day	Grab
Ammonia Nitrogen[13] (June 1 - October 31)	12 mg/L Report lb/day	---	Report, mg/L	2/week	Composite
Ammonia Nitrogen[13] (November 1 - May 31)	Report mg/L Report lb/day	---	Report mg/L	1/week	Composite

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly[4]	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[5]
Total Kjeldahl Nitrogen[13]	Report mg/L Report lb/day	---	Report mg/L	1/quarter	Composite
Total Nitrate[13]	Report mg/L Report lb/day	---	Report mg/L	1/quarter	Composite
Total Nitrite[13]	Report mg/L Report lb/day	---	Report mg/L	1/quarter	Composite
Total Nitrogen[13]	Report mg/L Report lb/day	---	Report mg/L	1/quarter	Composite
Total Phosphorus (April 1- October 31)	0.1 mg/L Report lb/day	---	Report mg/L	3/week	Composite
Total Phosphorus (November 1- March 31)	0.2 mg/L Report lb/day	---	Report mg/L	1/week	Composite
Whole Effluent Toxicity (WET) Testing[15,16]					
LC_{50}	---	---	≥ 100 %	1/quarter	Composite
C-NOEC	---	---	≥ 15 %	1/quarter	Composite
Hardness	---	---	Report mg/L	1/quarter	Composite
Ammonia Nitrogen	---	---	Report mg/L	1/quarter	Composite
Total Aluminum	---	---	Report mg/L	1/quarter	Composite
Total Cadmium[14]	---	---	Report mg/L	1/quarter	Composite
Total Copper	---	---	Report mg/L	1/quarter	Composite
Total Nickel	---	---	Report mg/L	1/quarter	Composite
Total Lead	---	---	Report mg/L	1/quarter	Composite
Total Zinc	---	---	Report mg/L	1/quarter	Composite
Total Organic Carbon	---	---	Report mg/L	1/quarter	Composite

Ambient Characteristic[17,18]	**Reporting Requirements**			**Monitoring Requirements**[1,2,3]	
	Average Monthly[4]	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**[5]
Hardness	---	---	Report mg/L	1/quarter	Grab
Ammonia Nitrogen	---	---	Report mg/L	1/quarter	Grab
Total Aluminum	---	---	Report mg/L	1/quarter	Grab
Total Cadmium[14]	---	---	Report mg/L	1/quarter	Grab
Total Copper	---	---	Report mg/L	1/quarter	Grab
Total Nickel	---	---	Report mg/L	1/quarter	Grab
Total Lead	---	---	Report mg/L	1/quarter	Grab
Total Zinc	---	---	Report mg/L	1/quarter	Grab
Total Organic Carbon	---	---	Report mg/L	1/quarter	Grab
pH[18]	---	---	Report S.U.	1/quarter	Grab
Temperature[18]	---	---	Report °C	1/quarter	Grab

Influent Characteristic	**Reporting Requirements**			**Monitoring Requirements**[1,2,3]	
	Average Monthly[4]	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**[5]
BOD_5	Report mg/L	---	---	2/month	Composite
TSS	Report mg/L	---	---	2/month	Composite

Footnotes:

1. Effluent samples shall yield data representative of the discharge. 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. The Permittee shall report the results to the Environmental Protection Agency Region 1 (EPA) and the State of any additional testing above that required herein, if testing is in accordance with 40 C.F.R. Part 136.

2. In accordance with 40 C.F.R. § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 C.F.R. Part 136 or required under 40 C.F.R. chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 C.F.R. Part 136 or required under 40 C.F.R. chapter I, subchapter N or O for the measured pollutant or pollutant parameter. The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

3. When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L).

4. In calculating and reporting the average monthly concentration when the pollutant is not detected, assign zero to the non-detected sample result if the pollutant was not detected for all monitoring periods in the prior twelve months. If the pollutant was detected in at least one monitoring period in the prior twelve months, then assign each non-detected sample result a value that is equal to one half of the minimum level of detection for the purposes of calculating averages.

5. Each composite sample 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 proportional to flow.

6. Report annual average, monthly average, and the maximum daily flow in million gallons per day (MGD). 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.

7. The pH shall be within the specified range at all times. The minimum and maximum pH sample measurement values for the month shall be reported in standard units (S.U.).

8. The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. Monitoring for total residual chlorine (TRC) is only required for discharges which have been previously chlorinated, or which contain residual chlorine. For the purposes of this permit, TRC analysis must be completed using a test method in 40 C.F.R. Part 136 that achieves a minimum level no greater than 20 µg/L. The compliance level for TRC is 20 µg/L.

   Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

9. The monthly average limit for *E. coli* is expressed as a geometric mean. *E. coli* monitoring shall be conducted concurrently with TRC monitoring if TRC monitoring is required.

10. See **Special Conditions, Part G**

11. Aluminum analysis must be completed using test method in 40 C.F.R. § 136 that achieves a minimum level no greater than 87 µg/L.

12. Copper analysis must be completed using a test method in 40 C.F.R. § 136 that achieves a minimum level no greater than 3 µg/L.

13. Ammonia nitrogen, total Kjeldahl nitrogen, total nitrate and nitrite nitrogen samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen (total nitrogen = total Kjeldahl nitrogen + total nitrate/nitrite nitrogen). The total nitrogen loading values reported each quarter shall be calculated as follows: Total Nitrogen (lb/day) = [(average monthly total nitrogen concentration (mg/L) * total monthly effluent flow (Million Gallon (MG))/# of days in the month] * 8.34.

14. Cadmium analysis must be completed using test method in 40 C.F.R. § 136 that achieves the minimum level no greater than 2.0 µg/L.

15. The Permittee shall conduct acute toxicity tests (LC_{50}) and chronic toxicity tests (C-NOEC) in accordance with test procedures and protocols specified in **Attachment A and B** of this permit. LC_{50} and C-NOEC are defined in Part II.E. of this permit. The Permittee shall test the daphnid, *Ceriodaphnia dubia*, and the fathead minnow, *Pimephales promelas*. Toxicity test samples shall be collected and tests completed during the same weeks each time of calendar quarters ending March 31st, June 30th, September 30th, and December 31st. The complete report for each toxicity test shall be submitted as an attachment to the monthly DMR submittal immediately following the completion of the test.

16. For Part I.A.1., Whole Effluent Toxicity Testing, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the effluent sample. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the Permittee shall follow procedures outlined in **Attachment A and B**, Section IV., DILUTION WATER. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

17. For Part I.A.1., Ambient Characteristic, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the receiving water sample collected as part of the WET testing requirements. Such samples shall be taken from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location, as specified in **Attachment A and B**. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

18. A pH and temperature measurement shall be taken of each receiving water sample at the time of collection and the results reported on the appropriate DMR. These pH and temperature measurements are independent from any pH and temperature measurements required by the WET testing protocols.

Part I.A. continued.

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

3. The discharge shall be free from pollutants in concentrations or combinations that, in the receiving water, settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

4. The discharge shall be free from pollutants in concentrations or combinations that adversely affect the physical, chemical, or biological nature of the bottom.

5. The discharge shall not result in pollutants in concentrations or combinations in the receiving water that are toxic to humans, aquatic life or wildlife.

6. The discharge shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to the receiving water.

7. The discharge shall be free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.

8. The Permittee must provide adequate notice to EPA-Region 1 and the State of the following:

    a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to Part 301 or Part 306 of the Clean Water Act if it were directly discharging those pollutants or in a primary industry category (see 40 C.F.R. Part 122 Appendix A as amended) discharging process water; and

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

    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.

9. Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

B. UNAUTHORIZED DISCHARGES

1. This permit authorizes discharges only from the outfall listed in Part I.A.1, in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit in accordance with Part II.D.1.e.(1) (24-hour reporting). See Part I.H below for reporting requirements.

2. Starting December 21, 2020, the Permittee must provide notification to the public within 24 hours of any unauthorized discharge on a publicly available web site. Such notification shall include the location and description of the discharge; estimated volume; 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.

3. Notification of SSOs to 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 https://www.mass.gov/how-to/sanitary-sewer-overflowbypassbackup-notification.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance (O&M) of the sewer system shall be in compliance with the Standard Conditions of Part II and the following terms and conditions. The Permittee shall 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 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. 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 O&M Plan

   The Permittee shall develop and implement a Collection System O&M Plan.

   a. Within six (6) months of the effective date of the permit, the Permittee shall submit to EPA and the State

(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 the State 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;
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow; and
(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 during the previous calendar year. The report shall be submitted to EPA and the State annually by March 31. The first annual report is due the first March 31st following submittal of the collection system O&M Plan required by Part I.C.5.b. of this permit. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;

b. A map and a description of inspection and maintenance activities conducted and 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. 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; and

f. If the average annual flow in the previous calendar year exceeded 80 percent of the facility's 1.45 MGD design flow (1.16 MGD), or there have been capacity related overflows, the report shall include:

(1) Plans for further potential flow increases describing how the Permittee will maintain compliance with the flow limit and all other effluent limitations and conditions; and
(2) A calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year.

D. 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 works it owns and operates, as defined in Part II.E.1 of this permit.

E. INDUSTRIAL USERS

1. The Permittee shall submit to EPA and the State the name of any Industrial User (IU) subject to Categorical Pretreatment Standards under 40 C.F.R. § 403.6 and 40 C.F.R. chapter I, subchapter N (Parts 405-415, 417-436, 439-440, 443, 446-447, 454-455, 457-461, 463-469, and 471 as amended) who commences discharge to the POTW after the effective date of this permit.

   This reporting requirement also applies to any other IU who discharges an average of 25,000 gallons per day or more of process wastewater into the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastewater which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW; or is designated as such by the Control Authority as defined in 40 C.F.R. § 403.12(a) on the basis that the industrial user has a reasonable potential to adversely affect the wastewater treatment facility's operation, or for violating any pretreatment standard or requirement (in accordance with 40 C.F.R. § 403.8(f)(6)).

2. In the event that the Permittee receives reports (baseline monitoring reports, 90-day compliance reports, periodic reports on continued compliance, etc.) from industrial users subject to Categorical Pretreatment Standards under 40 C.F.R. § 403.6 and 40 C.F.R. chapter I, subchapter N (Parts 405-415, 417-436, 439-440, 443, 446-447, 454-455, 457-461, 463-

469, and 471 as amended), the Permittee shall forward all copies of these reports within ninety (90) days of their receipt to EPA and the State.

F. 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 C.F.R. Part 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to § 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 C.F.R. 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 C.F.R. Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 C.F.R. § 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 C.F.R. § 503.6.

5. The 40 C.F.R. Part 503 requirements include 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 C.F.R. 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.[1]

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1 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, as follows:

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 C.F.R. § 503.8.

7. Under 40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 503.9(r), for use or disposal, then the Permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 C.F.R. § 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 C.F.R. § 503 Subpart B.

8. The Permittee shall submit an annual report containing the information specified in the 40 C.F.R. 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 electronically using EPA's Electronic Reporting tool ("NeT") (see "Reporting Requirements" section below).

G. SPECIAL CONDITIONS

Aluminum

The effluent limit for total aluminum shall be subject to a schedule of compliance whereby the limit takes effect three years after the effective date of the permit.[2] For the period starting on the effective date of this permit and ending three (3) years after the effective date, the permittee shall report only the monthly average aluminum concentration on the monthly DMR. After this initial three (3) year period, the permittee shall comply with the monthly average total aluminum limit of 274 µg/L ("final effluent limit"). The permittee shall submit an annual report due by January 15th of each of the first three (3) years of the permit that will detail its progress towards meeting the final effluent limit.

2 The final effluent limit of 274 µg/L for aluminum may be modified prior to the end of the three-year compliance schedule if warranted by the new criteria and a reasonable potential analysis, and if consistent with anti-degradation requirements. Such a modification would not trigger anti-backsliding prohibition, as reflected in CWA § 402(o) and 40 C.F.R. §122.44(l), provided that such modification is finalized before the final limit takes effect.

If during the three (3) year period after the effective date of the permit, Massachusetts adopts revised aluminum criteria, then the permittee may request a permit modification, pursuant to 40 C.F.R. § 122.62(a)(3), for a further delay in the effective date of the final aluminum effluent limit. If new criteria are approved by EPA before the effective date of the final aluminum effluent limit, the permittee may apply for a permit modification, pursuant to 40 C.F.R. § 122.62(a)(3), for a longer time to meet the final aluminum effluent limit and/or for revisions to the permit based on whether there is reasonable potential for the facility's aluminum discharge to cause or contribute to a violation of the newly approved aluminum criteria and meeting applicable anti-degradation requirements.

H. REPORTING REQUIREMENTS

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 Using NetDMR

   The Permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and the State no later than the 15th day of the month electronically using NetDMR. When the Permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or the State. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the Permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. *See* Part I.H.6. 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 report due date specified in this permit.

3. Submittal of Biosolids/Sewage Sludge Reports

   By February 19 of each year, the Permittee must electronically report their annual Biosolids/Sewage Sludge Report for the previous calendar year using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

4. Submittal of Requests and Reports to EPA Water Division (WD)

   a. The following requests, reports, and information described in this permit shall be submitted to the NPDES Applications Coordinator in EPA Water Division (WD):

(1) Transfer of permit notice;
(2) Request for changes in sampling location;
(3) Request for reduction in testing frequency;
(4) Request for change in WET testing requirement; and
(5) Report on unacceptable dilution water / request for alternative dilution water for WET testing.
(6) Report of new industrial users commencing discharge; and
(7) Report received from existing industrial user.

b. These reports, information, and requests shall be submitted to EPA WD electronically at R1NPDESReporting@epa.gov.

5. Submittal of Reports to EPA ECAD in Hard Copy Form

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

(1) Prior to 21 December 2020, written notifications required under Part II.B.4.c, for bypasses, and Part II.D.1.e, for sanitary sewer overflows (SSOs). Starting on 21 December 2020, such notifications must be done electronically using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.
(2) Collection System Operation and Maintenance Plan
(3) Report on annual activities related to O&M Plan

b. This information shall be submitted to EPA Enforcement and Compliance Assurance (ECAD) at the following address:

U.S. Environmental Protection Agency
Enforcement and Compliance Assurance Division
Water Compliance Section
5 Post Office Square, Suite 100 (04-SMR)
Boston, MA 02109-3912

6.. State Reporting

Duplicate signed copies of all WET test reports shall be submitted to the Massachusetts Department of Environmental Protection, Division of Watershed Management, at the following address:

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Division of Watershed Management
8 New Bond Street
Worcester, Massachusetts 01606

7. Verbal Reports and Verbal Notifications

   a. Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to the State. This includes verbal reports and notifications which require reporting within 24 hours (e.g., Part II.B.4.c. (2), Part II.B.5.c. (3), and Part II.D.1.e.).

   b. Verbal reports and verbal notifications shall be made to:

EPA ECAD at 617-918-1850

and

MassDEP's Emergency Response at 1-888-304-1133

I. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are 1) 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 2) 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 CMR 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 C.F.R. 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 EPA. 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.

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^{o}C.

IV. DILUTION WATER

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

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

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

and

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

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

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/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 TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

		series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

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

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

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each 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	$\geq$ 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.

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

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

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

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

No Observed Acute Effect Level (NOAEL)

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

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

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^{o} 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 ≥ 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.

Parameter	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 that 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

MAYNARD WATER POLLUTION CONTROL FACILITY
NPDES Permit No. MA0101001

RESPONSE TO PUBLIC COMMENTS

On October 25, 2018, Region 1 of the U.S. Environmental Protection Agency ("EPA") and the Massachusetts Department of Environmental Protection ("MassDEP') (together, the "Agencies") released draft National Pollutant Discharge Elimination System ("NPDES") permit MA0101001 ("Draft Permit") for public notice and comment for the Maynard Water Pollution Control Facility ("Facility"). The public comment period for the Draft Permit ended on November 23, 2018. In accordance with the provisions of 40 C.F.R. § 124.17, this document presents EPA's responses to comments received on the Draft Permit ("Response to Comments").

EPA and MassDEP received comments from the Town of Maynard, MA (the "permittee" or the "Town"), dated November 21, 2018; the Organization for the Assabet Rivers (OARS), dated November 21, 2018; the Sudbury, Assabet, and Concord Wild & Scenic River Stewardship Council ("RSC"), dated November 15, 2018; the Massachusetts Water Works Association ("MWWA"), dated November 19, 2018; and, the Massachusetts Coalition for Water Resources Stewardship ("MCWRS"), dated November 21, 2018.

Following a review of the comments received, EPA has made a final decision to re-issue the permit authorizing this discharge ("Final Permit"). EPA's knowledge of the facility has benefited from the various comments and additional information submitted. While the information and arguments received did not raise any substantial new questions concerning the permit, EPA did, however, make certain clarifications in response to comments. These improvements and changes are detailed in this document and reflected in the Final Permit. In accordance with the provisions of 40 C.F.R. § 124.17, the comments received and EPA's responses to those comments, including a description of any changes made to the permit as a result of those comments, as well as any clarifications EPA considers necessary, are described below.

A copy of the Final Permit may be obtained by calling or writing Betsy Davis, United States Environmental Protection Agency, 5 Post Office Square – Suite 100 (06-1), Boston, Massachusetts 02109-3912, Telephone (617) 918-1576. Copies of the Final Permit and the Response to Comments may also be obtained from the EPA Region 1 website at https://www3.epa.gov/region1/npdes/permits_listing_ma.html.

A. Summary of Changes to the Final Permit

1. Total Organic Carbon, from the chemical analyses of the Whole Effluent Toxicity test, has been added to the list of constituents in the effluent and ambient monitoring table on pages 2 and 3 of the Final Permit.

2. The third sentence in Footnote #13 has been corrected to read, "The total nitrogen loading values reported each quarter shall be calculated as follows: Total Nitrogen (lbs/day) = [(average monthly total nitrogen concentration (mg/L) * total monthly effluent flow (Million Gallons (MG))/# number of days in the month] * 8.34".
   The Draft Permit indicated the loading value was calculated using an influent flow rather than the effluent flow. The correct flow to use in the equation is the effluent flow and that is the basis for the change in the final permit.

3. Part I.B has been modified to include a public notification requirement during sanitary sewer overflows. Starting on December 21, 2020, the permittee must provide notification

to the public within 24 hours of any unauthorized discharge on a publicly available web site.

4. EPA Region 1 was reorganized in April 2019. Section H of the Final Permit reflects updated web sites and addresses for report submittals, updated phone numbers for verbal report notifications and changes to department and division names at the Agency.

B. Response to Public Comments[1]

The following comments were received from the **Town of Maynard**.

Comment No. A.1

Collection System

The Draft Permit includes a maintenance staff requirement that the Town have dedicated collection system staff as indicated on page 9 of 17 under C.1. Maintenance Staff. Items C.5. Collection System O&M Plan a. (1) and b. (3) on pages 10 and 11 of 17 in the draft permit imply that a dedicated staff may be required, which would impose a staffing hardship on the Town. As a small system, the Town has staff that fill multiple rolls within the water and sewer departments. A crew may be doing pump station inspections in the morning and cleaning out a tank at the WTP in the afternoon. If there is a sewer plug or pipeline collapse, the Town treats this as an all hands-on deck situation and staff will be redirected to work on a problem in the collection system until it is resolved. The Town needs to keep this flexibility since the size of the Town's systems does not warrant a totally separate collection system crew. Therefore, the Town requests that staffing requirements for collection system maintenance remain as they are today and that the Town's staffing plan allow for the staff to serve multiple roles.

Response to Comment No. A.1

Part I.C. Operation and Maintenance of the Sewer System, of the Draft Permit, included a reporting requirement to provide staffing information to the Agencies. It is not EPA's intent to require that the Town have "dedicated" collection system staff. Part I.C.1 states only that "an adequate" staff be available to carry out the operation, maintenance, repair and testing functions with the terms and conditions of the permit which does not preclude staff from filling multiple roles.

Part I. C.(5)(a) requires the permittee to devise a collection system operation and maintenance plan, which includes setting goals and assigning staff to achieve those goals. Under this provision, decisions over goals and specific staffing levels or assignments rest with the Town. In its plan, the Town can acknowledge its limited staff, and describe its intention for that staff to be deployed in multiple roles when carrying out the operation, maintenance, repair and testing functions to ensure compliance with the permit. EPA is retaining the condition in the Final Permit.

Comment No. A.2

Aluminum

The Draft Permit includes an average monthly limit for Aluminum of 274 ug/L, whereas the previous permit from 2005 only required reporting of aluminum levels. We understand that the national aluminum standards and method for calculating the aluminum criteria are currently under review. We also, are

[1] Comments are reproduced below as received; they have not been edited.

concerned that the current treatment operation would require modifications to meet this new aluminum standard. The WWTP uses polyaluminum chloride (PAC) as a coagulant as part of our Co-Mag process to remove phosphorous. This process is successful for the intended purpose and changing our coagulant would have unintended consequences. Finally, we have worked recently with the USGS to locate a water quality sampling station in the Assabet River to better understand the naturally occurring background levels of Aluminum in the river. It would be prudent to allow that effort to develop good data before imposing a new limit at the WWTP. Therefore, the Town requests that the monthly limit for aluminum be eliminated from the Permit and the current requirement for reporting aluminum levels remain as is.

Response to Comment No. A.2

EPA commends and supports the Town working with the USGS to better understand the background level of aluminum and other water chemistry parameters (dissolved organic carbon, pH, and hardness) in the Assabet River. For the reasons explained below, the data collected from the instream samples will be reviewed during a subsequent permit renewal or a permit modification. (EPA understands that data collection under this effort is still ongoing, therefore the dataset has not been provided to EPA at this time.)

EPA is obligated pursuant to 40 C.F.R.§ 122.44(d) to include any effluent limit in a permit that is necessary to comply with the water quality standards (WQS) that are in effect at the time the permit is issued. If there is a reasonable potential to violate water quality standards, then pursuant to 40 C.F.R. § 122.44(d) an effluent limitation is "necessary," and EPA is obligated to include a limit in the permit. EPA does not forestall permit issuance, pending development, submission and approval of revised WQS, particularly where, as here, the previous permit has long since expired. To do so would subject the permitting process to significant delay and uncertainty, since there is no way to predict the level at which any new criteria will be established, and when such criteria will become effective. The criteria development process often takes many years. The Massachusetts' WQS now in effect require that EPA base effluent limitations for metals on the criteria published in the *National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002*, unless site-specific criteria are established or MassDEP determines that natural background concentrations are higher than the criteria (314 CMR § 4.05(5)(e)). MassDEP has not issued site-specific aluminum criteria for the Assabet River or determined that natural background concentrations are higher than the current aluminum criteria.

For similar reasons, in order to determine the existence of reasonable potential, EPA uses data that are available at the time the Draft Permit is developed and does not delay imposition of effluent limitations found to be necessary based on existing data currently available to the agency pending the collection of new data. New data can always be collected, and there are regulatory avenues (*i.e.*, permit modification and permit reissuance) for those data to be evaluated in due course. EPA concluded upon analysis of available data that a reasonable potential to cause or to contribute to a violation of water quality standards exists and, therefore, the permit must include a water quality-based effluent limitation for aluminum. EPA notes that the purpose of the aluminum monitoring and reporting requirement in the Town's 2005 Permit was to collect aluminum data that could be used in a reasonable potential analysis for this permit.

On December 21, 2018, the Agency published revised national recommended aluminum water quality criteria for fresh waters. MassDEP is working in parallel on new state-specific aluminum criteria among other changes to the Massachusetts WQS.[2] The Final Permit includes a three-year compliance schedule that can be extended by permit modification if Massachusetts has adopted new criteria during that time. If

[2] See more information at https://www.mass.gov/regulations/314-CMR-4-the-massachusetts-surface-water-quality-standards#pre-public-comment-proposed-changes-to-water-quality-standards.

the Commonwealth adopts and EPA approves the new criteria, the permittee may request a permit modification to extend the compliance schedule or adjust the new aluminum limits, if appropriate.

Comment No. A.3

Total Phosphorus

The Draft Permit includes an average monthly total phosphorus limit of 0.2 mg/L for November 1 through March 31, reduced from 1.0 mg/L in the 2005 Permit. As mentioned previously, our Co-Mag treatment process is successfully removing phosphorous consistently to our current limit and further reducing the permit limit would increase chemical usage and cost to operate the facility. We understand that additional study is currently underway to assess the positive impacts to the Assabet River from the WWTP upgrades that have been completed in recent years to reduce phosphorous discharges. Again, it would be prudent to allow that effort to develop good data before imposing a new limit at the WWTP. Therefore, the Town requests that the discharge limits for phosphorous remain unchanged, at this time, from the current permit limits.

Response to Comment No. A.3

As explained in Comment No. A.2, EPA develops effluent limits in renewed permits based on the best information and data reasonably available at the time of drafting the permit. Although EPA agrees that the Facility has been successfully removing phosphorus consistent with the requirements of the 2005 Permit, and commends the Town for its operational performance, EPA disagrees with the comment's implication that additional study is necessary to determine whether reduced winter effluent limits are warranted. As discussed in the Fact Sheet that was issued with the Draft Permit, studies on the Assabet River since the last permit was issued form the basis for the revised phosphorus limit during the cold weather season. The Fact Sheet (see page 23) references the 2004 Assabet River Total Maximum Daily Load ("TMDL") prepared by the MassDEP and the 2010 Assabet River, Massachusetts, Sediment and Dam Removal Feasibility Study (Feasibility Study) prepared by the Army Corp of Engineers. The reports convey that sediment remediation and treatment plant upgrades should both be implemented to achieve water quality standards in the river. The upgrades to the treatment plant have been completed; however, the release of phosphorus accumulated in the sediments during the summer (known as phosphorus flux or P flux) has not been addressed by the communities. A 2012 survey conducted by the MassDEP found that the Assabet River is not yet achieving water quality standards.

The June 2008 Assabet River Sediment and Dam Removal Study Modeling Report was also referenced in the Fact Sheet. This report applied data in the modeling and analysis to assess, among other things, whether additional reductions in winter phosphorus limits at the Assabet River Wastewater Treatment Facilities (WWTFs) would affect the release of phosphorus accumulated during the summer. The model results indicated that: "The phosphorus discharged from the WWTFs during the winter had a very significant impact on the P flux the following summer."[3]

Therefore, in the absence of any dam removal or other activities to reduce the P flux, and in lieu of more stringent growing season limits, which is an option EPA considered, reduced winter water quality phosphorus effluent limits are consistent with the assumptions and requirements of the TMDL's Wasteload Allocation and also consistent with other record information before the Agencies, including the scientific inquiries undertaken since the 2005 Permit was issued.

[3] CDM 2008, Assabet River Sediment and Dam Removal Study, Modeling Report, June 2008, page 5.

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The following comments were received from **the Organization for the Assabet Rivers (OARS)**

Comment No. B.1

Screening Priority Pollutants and Contaminants of Emerging Concern

Due to the rapidly changing science on emerging contaminants (CECs) and advances in detection levels, as well as possible local changes in businesses and industries over time, we ask that the applicant conduct a Priority Pollutant Screening every five years (in the event this Phase 2 permit is extended as the Phase 1 permit was) using the most current Priority Pollutant list. Where there are CECs that may reasonably be considered to be possible contaminants of the Maynard effluent, they should be included. We also note that the application for this permit was received June 3, 2010. If no current priority pollutant screening data was supplied at the time of the draft permit renewal (e.g., 2017 or 2018), we ask that current priority pollutant screening be conducted and the results provided to the permitting agencies prior to the permit being finalized in case there are any new sources of priority pollutants.

Response to Comment No. B.1

Facilities are required to complete priority pollutant scans when renewing their NPDES permits.[4] The Town's NPDES Permit application included priority pollutant effluent testing data as required.

The comment does not request specific information on a pollutant or pollutant parameter and the standard advanced by the commenter— "reasonably considered to be possible contaminants"—would not provide sufficient clarity to the Town on the contaminants required to be included in the scan. Further, many CEC's do not have an applicable water quality criterion. Still, EPA reserves broad discretion to ask for additional information pursuant to Section 308 of the CWA and may exercise this authority if for example EPA determines a pollutant or pollutant parameter is discharged into the receiving water that causes or has reasonable potential to cause an excursion of a State water quality standard after characterizing the effluent and receiving water data. While EPA believes it would be premature and potentially confusing to include the provision sought by the commenter at this time, EPA is cognizant of the importance and potential impact of CECs, and will continue to monitor developments in this area, and will in future permit cycles fashion necessary and appropriate requirements if warranted by evidence in the record. As the commenter may be aware, EPA's Office of Research and Design is doing research in conjunction with the United States Geological Survey (USGS) on the prevalence of emerging contaminants in rivers and streams and information on the research is available at https://www.epa.gov/water-research/determining-prevalence-contaminants-treated-and-untreated-drinking-water.

Comment No. B.2

We support the addition of total Kjeldahl Nitrogen, Total Nitrate/Nitrite, and Total Nitrogen reporting, but an expectation should be set for removal of nitrogen from the effluent prior to discharge. Monthly monitoring could provide more useful information about seasonal loading.

OARS water quality monitoring data show that there has been a slow increase in in-stream nitrate-N concentrations over the past 17 years[5].

[4] 40 C.F.R. Section 122.21(j)(4)(viii)
[5] OARS Water Quality Monitoring Program Final Report:2017 Field Season, February 2018

This is in contrast to the decreasing in-stream phosphorus levels. Since phosphorus is considered the controlling nutrient in freshwater systems, the focus for the Assabet River impairment has legitimately been on phosphorus. However, since nitrogen is the controlling nutrient in estuarine systems, and nitrogen has been found to pose a threat to the Merrimack estuary (Fact Sheet, p. 22), we now need to consider the downstream effects. In Footnote 13 (Permit, p. 6) the calculation for nitrogen loading calls for using the total monthly influent flow. Please explain why the influent flow rather than effluent flow is being measured and whether this is the actual (not rolling average) total.

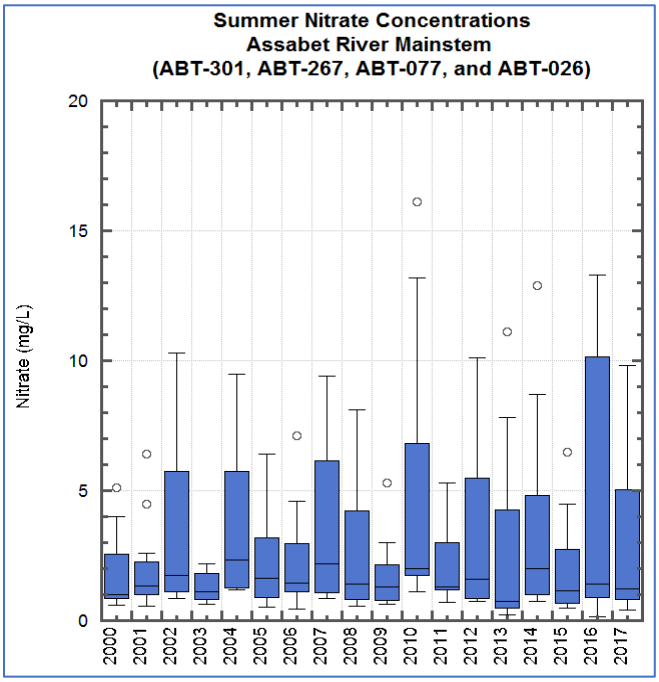

Figure 1: Assabet River in-stream nitrate concentrations (mg/L) 2000-2017 (OARS data)

As the Fact Sheet narrative discusses, nitrogen levels in the Merrimack River estuary are higher than is acceptable for a healthy near-shore coastal system. This permit requires only sampling and reporting of most forms of nitrogen (limit only for ammonia) arguing more study is needed. In the meantime, the estuary is, at best, stressed and the Gulf of Maine experiences increasingly worrisome conditions including increasing geographical and spatial extent of red tide blooms. We recommend that the permit require the WWTP to reduce nitrogen in its effluent to the maximum extent possible with its current treatment process year-round, and to report on its efforts to reduce nitrogen in the effluent. While this would not be a permit limit or a requirement to add more treatment processes, we think it is important to encourage the facility to investigate source reduction and process optimization at this point. Monthly monitoring, rather than quarterly, could assist this process.

Response to Comment No. B.2

EPA concurs that recent data show elevated levels of total nitrogen in the estuarine portions of the Merrimack River and agrees it would be prudent for the Town to be proactive at the treatment plant to reduce nitrogen in the effluent wherever possible. EPA is currently monitoring nitrogen in the estuary as part of a multi-year-long study of nitrogen levels and possible impacts on aquatic life and, if necessary, EPA will take a watershed wide permitting approach to reduce nitrogen from point sources that discharge into the Merrimack River and its tributaries (including the Assabet River).

Based on the available data (such as monthly DMRs, data from the study etc.), and a reasonable potential analysis during subsequent permit development, a future permit may require nitrogen limits and/or process optimization at the facility.

The calculation in Footnote 13 has been corrected to use to the effluent flow rather than the influent flow that was in the Draft Permit.

It is intended to be the monthly average flow, not a rolling average. However, averaging will only be required if the facility goes beyond the quarterly sampling required in the permit and takes more than one sample in a month.

Comment No. B.3

The 7Q10 should be recalculated at 5-year intervals no matter the actual interval of permit re-issuance.

Massachusetts Water Quality Standards require the use of the 7Q10 flow in pollutant loading calculations for determining dilution[6]. The 7Q10 calculation is thus critical to the accurate determination of appropriate discharge limits. Given that climate change predictions consistently predict more frequent low-flow periods it is important that the 7Q10 calculation keep up with the changing conditions in the river. We strongly recommend that the 7Q10 be recalculated every 5 years and that the calculation include the most recent data available. While this would be within the normal five-year permit reissuance process, it has been 13 years since the last permit went into effect. Based on that fact, we recommend a clause requiring the recalculation of the 7Q10 every 5 years whether or not the permit is being reissued. If the 7Q10 changes due to the recalculation, some of the permit limits could also change. Those newly calculated limits should take effect at that point. We see this as an important measure to adapt to climate change.

Response to Comment No. B.3

It is EPA's practice to recalculate the 7Q10 with every permit reissuance and adaptation to changing hydrological conditions is already built into the permitting process. Changing the permit limits during a permit cycle may confuse the regulated community and public due to a lack of transparency. This is particularly true where such a dynamic provision would require manipulation and analysis of data, and furthermore, would impact other portions of the permit. Therefore, we prefer, except in unusual cases, more straightforward and constant expression of permit limits. Finally, EPA is currently implementing a permit backlog reduction strategy, and in the future expects more expeditious reissuance of expired permits, which EPA expects will mitigate the concerns raised by the commenter.

Comment No. B.4

Due to the toxicity of aluminum to aquatic life, we support the addition of an aluminum limit.

Response to Comment No. B.4

EPA acknowledges the comment.

Comment No. B.5

More information is needed on efforts to maximize I/I removal.

This draft permit does not discuss actual and minimum daily effluent flows, as far as we could see. We support the new requirements for collection system mapping, and preparation of a collection system operation and maintenance plan. We also ask that the collection system mapping be made available to the public (via the Maynard town GIS, if possible). Maynard should be encouraged to commit to significant progress on eliminating I&I.

[6] 314 CMR 4.03(3)(a)

Response to Comment No. B.5

The Final Permit requires the Town report the annual average, monthly average and maximum daily flows on the monthly discharge monitoring reports (DMRs) which is submitted electronically to EPA. Daily flow data is available in a monthly operating report that is submitted to MassDEP and is a state reporting requirement only.

EPA agrees that infiltration and inflow is a significant problem at many POTWs. Public access to collection system mapping is already available as collection system maps are public documents. It is the Town's decision on how to provide public access to the collection system maps, whether provided in GIS or another format.

The goal of the collection system O&M requirements in the permit are the prevention of sanitary sewer overflows from the community's collection system and prevention of flow-related violations at treatment works.

Additionally, Massachusetts regulations at 314 CMR 12.04(2) require that all sewer systems authorities develop and implement an ongoing plan to control infiltration and inflow to the sewer system. This includes a requirement to complete an Infiltration/Inflow Analysis of the sewer system. Maynard is currently working with MassDEP, to finalize their I/I Analysis.

Comment No. B.6

Sanitary Sewer Overflows (SSO) and treatment bypasses

We support reporting SSOs to MassDEP. With changing precipitation patterns we can expect more frequent extreme rain events and flooding. At the same time, the river is heavily used for recreation and our office, among others, regularly gets calls from boaters regarding river conditions. When there is a sanitary sewer overflow, a treatment bypass, or a release of untreated or partially-treated wastewater for any reason, the town of Maynard should also notify the municipalities downstream, including Billerica, notify OARS, and post a notice on the town website to alert the public that they and their pets should avoid being in contact with the water for a specified time interval. Notifications are common practice for Combined Sewer Overflows in other communities.

Response to Comment No. B.6

EPA and MassDEP share the commenter's concern, particularly in light of downstream drinking water and recreational uses that may be impacted by SSOs. Part 1.B of the final permit has been modified to include a public notification requirement during sewer system overflows. Part II B.4 of the final permit provides notification requirements for an unanticipated and anticipated treatment bypass.

Starting on December 21, 2020, the permittee must provide notification to the public within 24 hours of any unauthorized discharge on a publicly available website. The notification will include the location and description of the discharge, its estimated volume, the period of noncompliance, and anticipated duration of the unauthorized discharge when it is not been corrected. Beyond this, which EPA believes is sufficient to apprise the public of an unauthorized discharge, downstream cities and towns and other impacted entities or persons may consider making a direct request to Maynard to receive notification upon occurrence of an SSO or bypass through a listserver or other means of communication.

Comment No. B.7

The draft permit does not fully comply with the federal and Massachusetts Clean Water Acts because the total phosphorus discharge concentration limits do not ensure the attainment of the water quality standards established for Class B waters, as required by Section 301(b)(1)(C) of the Clean Water Act and 40 CFR § 122.4(d).

We support the reduction in winter Total Phosphorus (TP) limits and ask that a year-round limit of 0.1 mg/L (TP) be considered.

The draft permit reduces the winter concentration from 1.0 mg/L to 0.2 mg/L. This is a significant reduction and is a logical step in line with the study by the Army Corps of Engineers on the contribution of sediments impounded by dams on the Assabet River to water quality impairment due to phosphorus recycling[7] This study showed that phosphorus discharged from wastewater treatment plants during the winter was likely to be deposited to the sediments and subsequently released to fuel aquatic plant growth in the next growing season.

Since there has been no progress in remediating the sediment impacts through dam removal or other method, the only tool available through this permit is to significantly reduce the new phosphorus being added to the river and its impoundments. The winter TP concentration in this permit, however, is still twice the growing season concentration of 0.1 mg/L. The phosphorus loading can also be expected to be higher in the winter due to a larger volume of wastewater discharged[8]. We recognize the effort made by the treatment plant operator to keep TP concentrations well below the 2005 permit limit of 1.0 mg/L. However, since this is the only means of meeting the TMDL target of 90% reduction in sediment phosphorus flux, we ask that a year-round limit of 0.1 mg/L TP be considered. No justification has been offered for why the winter limit should be twice the summer limit in this permit. Removal of the reporting requirement for ortho-phosphorus effluent concentrations seems reasonable.

Response to Comment No. B.7

As with the 2005 NPDES permits for the four Assabet River wastewater treatment facilities, EPA intends to issue NPDES permits for these facilities with consistent total phosphorus limits of 0.1 mg/L in the summer months (growing season) and 0.2 mg/L in the winter months (non-growing season). Applying uniform total phosphorus effluent limits for each facility is also consistent with the load allocation approach used in the Assabet TMDL. Each facility is differently configured and some facilities will need to make changes in operation or chemical addition before achieving 0.2 mg/L during the winter months.

As discussed in the Fact Sheet (see Fact Sheet, page 23), the purpose of the reduced winter limits is to reduce the amount of total phosphorus that settles out in the impoundments and becomes available for resuspension in the warmer months, contributing to eutrophication in the impoundments and downstream waters during the growing season. The higher limit of 0.2 mg/L in winter accounts for the challenge of biological and chemical treatment system operation during low winter temperatures as well as the fact that the portion of total phosphorus that does not settle out in the impoundments in winter does not affect biota in the river or its impoundments since it is only present outside the growing season. Assabet River

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[7] *Assabet River Massachusetts: Sediment and Dam Removal Feasibility Study*, US Army Corps of Engineers, September 2010.

[8] EPA Discharge Monitoring Report (DMR) Pollutant Loading Tool. http://cfpub.epa.gov/dmr/adv_search.cfm. Accessed: Jan 17, 2018.

data collected by USGS demonstrates that some of the total phosphorus entering the impoundments in winter passes through the impoundments.[9]

Nevertheless, the reduction of the winter total phosphorus effluent limits for wastewater treatment plants discharging to the Assabet River will result in a substantial reduction in the annual permitted load. For Maynard, the lower limit will reduce the permitted load from 5.7 lb/day to 1.7 lb/day. The overall annual discharge of total phosphorus from the treatment plants into the Assabet River will be similarly reduced, as summarized in Table 1. This middle-ground approach reflects EPA's conclusion that while water quality has continued to improve since the last round of permit issuance, impairments remain and achievement of applicable water quality standards will be accelerated through significant reductions (approximately 80%) in the winter permitted load without defaulting to the most stringent option on the table. In coming to this decision, EPA also accounted for the underlying scientific and technical uncertainty over the receiving water response in a system as complex as the SuAsCo, especially given changes to its hydrology, and acknowledges that there exists a range of protective limits. One benefit of the option adopted by EPA is that these reductions, and attendant water quality benefits, will be realized relatively early in the permit term through operational changes, as they will not entail major treatment plant upgrades.

Table 1 - Summary of Assabet River Total Phosphorus NPDES Permitted Load Reductions from 2005 to 2019 Permits

	Design Flow (MGD)	Summer TMDL Limit (mg/L)	2005 Winter Limit (mg/L)	2005 Annual Average Permitted Load (lb/day)	2019 Winter Limit (mg/L)	2019 Annual Average Permitted Load (lb/day)
Westborough	7.68	0.1	1	30.4	0.2	9.1
Marlborough West	2.89	0.1	1	11.4	0.2	3.4
Hudson	3	0.1	1	11.9	0.2	3.5
Maynard	1.45	0.1	1	5.7	0.2	1.7
TOTAL				59.5		17.7

The following comments were received from **the Sudbury, Assabet and Concord Wild & Scenic River Stewardship Council.**

Comment No. C.1

We support the addition of total Kjeldahl Nitrogen, Total Nitrate/Nitrite, and Total Nitrogen reporting, but an expectation should be set for removal of nitrogen from the effluent prior to discharge. The River Stewardship Council works closely with OARS watershed association as a partner in their water quality monitoring program. OARS' data shows a slow increase in the in-stream nitrate-N concentrations over 17 years. While the focus has been on Phosphorus as the controlling nutrient in freshwater systems, nitrogen is the controlling nutrient in estuarine systems, and higher levels pose a threat to ecological systems downstream. We support OARS' recommendation that the permit require the WWTP to reduce nitrogen

[9] Savoie.J.G., 2016 Streamflow and total phosphorus and orthophosphate data samples collected in and near the Assabet River, Massachusetts, October 2008 through April 2014: U.S. Geological Survey data release. https://dx.doi.org/10.5066/F72R3PR3, pages21-33.

in its effluent to the maximum extent possible with its current process and facilities, and to report on these efforts to reduce nitrogen.

Response to Comment No. C.1

See Response to Comment No. B.2.

Comment No. C.2

We support the reduction in winter Total Phosphorus (TP) limits but ask that a year-round limit of 0.1 mg/L (TP) be considered. The draft permit makes a meaningful reduction of the winter concentration from 1.0 mg/L to 0.2 mg/L but allows for a seasonal difference in limits (0.1mg/L in summer). A 2010 study by the Army Corps of Engineers on the contribution of sediments impounded by dams on the Assabet River to water quality impairment showed that phosphorus discharged from WWTFs during the winter was likely to be taken up by sediments and later released during the growing season and increase nuisance plant growth. The winter TP concentration in this permit is still twice the growing season concentration of 0.1 mg/L. Since the dams have not been removed per ACOE recommendations, the only recourse to meet the TMDL target of 90% reduction in sediment phosphorus flux is to reduce phosphorus discharges to the maximum extent possible. The Assabet River is noted on the Fact Sheet as having a Class B – Warm Water Fishery water quality standard; the draft permit therefore does not fully comply with the federal and Massachusetts Clean Water Acts because the total phosphorus discharge concentration limits do not ensure the attainment of the water quality standards established for Class B waters.

Response to Comment No. C.2

See Response to Comment No. B.7.

Comment No. C.3

The 7Q10 should be recalculated at 5-year intervals no matter the actual interval of permit re-issuance. MA's 7Q10 calculation, a requirement of the Water Quality Standards, is a critical measure in determining appropriate discharge limits. In order to adapt to climate change, we need nimble and responsive planning, as storm events and low-flow periods both increase in frequency. We strongly recommend that the 7Q10 be recalculated every 5 years; should the permit implementation take longer than 5 years (it has been 13 years since the last permit went into effect), we recommend a clause requiring the recalculation of the 7Q10 every 5 years whether or not the permit is being reissued. If the 7Q10 changes, newly calculated permit limits should take effect at that point.

Response to Comment No. C.3

See Response to Comment B.3

Comment No. C.4

We ask that the Town of Maynard conduct a Priority Pollutant Screening every five years using the most current Priority Pollutant list. Where there are contaminants of emerging concern ("CECs") that may be reasonably considered to be possible contaminants of the Maynard effluent, they should be included. The CECs and advances in detection levels are rapidly changing.

Response to Comment No. C.4

See Response to Comment No. B.1.

Comment No. C.5

We support the reporting of Sanitary Systems Overflows ("SSO") to DEP. When there is an SSO or treatment bypass, downstream towns should be notified, and particularly Billerica since they withdraw drinking water downstream. We request that these towns and the RSC be notified, and that notices be publicly issued that the public should avoid contact with the water for a specified time interval. This is important due to the recreational use of the river by boaters.

Response to Comment No. C.5

See Response to Comment B.6

The following comments were received from **the Massachusetts Water Works Association (MWWA).**

Comment No. D.1

MWWA has gone on the record numerous times that 87 µg/L is an inappropriate standard for Aluminum in permits in the New England region. Many of the receiving waters in Massachusetts, including many high quality pristine waterways, already have natural background levels of Aluminum that exceed the national water quality standard that is currently used as the basis for numeric permit limits. The high levels of background Aluminum in waters generally considered to be very clean suggest that the current standard is grossly inaccurate and unnecessarily overprotective.

Response to Comment No. D.1

EPA is required to determine reasonable potential and develop permit limits based on a state's current water quality standards. Massachusetts' current water quality standards, 314 CMR Section 4.05(e), references the *National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002* as a basis for allowable receiving water concentrations not enumerated in previous sections of the chapter. According to the *National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002,* the acute and chronic criteria for aluminum in a fresh water body are 87 µg/L and 750 µg/L. See Response A.2 above.

Comment No. D.2

We are concerned that EPA is moving forward with issuing any permits with Aluminum criteria while your agency is in the midst of a national process to change the methodology for calculating the Aluminum criteria. MWWA provided comments to EPA on this proposed national criteria and we understand EPA is still in the process of reviewing the public comments received before finalizing methodology. Upon our initial review, it appears that the proposed revised criteria will provide some flexibility to permittees in Massachusetts because it uses an equation that takes into account specific water quality in the receiving waters.

Response to Comment No. D.2

On December 21, 2018, EPA published new recommendations for the acute and chronic aluminum criteria in the Federal Register. The water quality criteria documents can be reviewed at https://www.epa.gov/wqc/aquatic-life-criteria-aluminum#2018.

Massachusetts is working in parallel on new state-specific aluminum criteria. However, until the Commonwealth adopts the recently issued Federal criteria recommendations or develops state-specific criteria, the *National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002* are the applicable aluminum criteria used in the reasonable potential analysis to calculate permit limits.

The final permit includes a three-year compliance schedule that can be extended by permit modification if Massachusetts has adopted new criteria during that time. Following state submittal and EPA approval of the new criteria, the permittee may request a permit modification to extend the compliance schedule or adjust the new aluminum effluent limit, if appropriate.

Comment No. D.3

While we appreciate the language included in Paragraph G, Special Conditions, that the new limit shall take effect three years after the effective date of the permit; we question including a limit at all until the national criteria is finalized. Further, as indicated in the Fact Sheet, "EPA is aware of ongoing efforts by MassDEP to soon revise the Massachusetts aluminum criteria based, at least in part, on forthcoming new EPA aluminum criteria recommendations which are expected to be finalized within the coming months. …EPA's draft aluminum criteria recommendations indicate that the new aluminum criteria recommendations may be higher than the current recommendations. …EPA reasonably expects its (MassDEPs) new criteria may also be higher." The draft permit provides Maynard with an option to seek a permit modification should MassDEP propose and EPA approve a revised Aluminum standard during that 3 year period before the permit becomes effective.

While the draft permit provides an "escape clause" for the Town, that off-ramp is contingent on MassDEP and EPA getting a new standard approved and in place within 3 years of the permit issuance. MWWA is concerned that the schedule for criteria development and ensuing regulatory changes might take longer than the agencies anticipate. If delays occur, Maynard remains at risk of having the Aluminum limit take effect before the standard change has been made. The permit does not speak to this circumstance but one might infer that anti-backsliding would then come into play and Maynard would be held to a lower limit for Aluminum than is supported by sound science.

Therefore, we ask that EPA strike the numeric criteria for Aluminum from this permit and maintain solely a monitoring requirement until EPA headquarters finalizes the new methodology and/or the state updates its surface water quality standards.

Response to Comment No. D.3

EPA disagrees that a three-year compliance schedule will not provide sufficient time for Massachusetts to adopt the new aluminum criteria. According to MassDEP's schedule provided to the public during meetings in February 2019, MassDEP is planning to complete adoption in early 2020[10], well within the three-year compliance schedule in the Final Permit. EPA disagrees that anti-backsliding would

[10] See presentation posted at https://www.mass.gov/regulations/314-CMR-4-the-massachusetts-surface-water-quality-standards#pre-public-comment-proposed-changes-to-water-qaulity-standards.page 5.

necessarily preclude relaxation of the permit limit under the hypothetical circumstances described by the commenter.

The Final Permit also has a footnote stating that anti-backsliding provisions will not be triggered if the aluminum limit is modified based on the revised water quality criteria prior to the 274 ug/L going into effect. Also see Response to Comments A.2, D.1 and, D.2.

The following comments were received from **the Massachusetts Coalition for Water Resources Stewardship (MCWRS).**

Comment No. E.1

It has been noted in past comments that many high-quality waters in Massachusetts that do not receive any discharges have total aluminum concentrations that frequently far exceed the 87 µg/L standard. These waters are not devoid of aquatic life and show no evidence of toxic impacts from aluminum. In many cases these waters are in well protected watersheds tributary to drinking water supply reservoirs across the State. It would appear unreasonable to assume the current water quality standard is correct given the lack of impacts to aquatic life in waters with total aluminum levels that may be 20 times higher than the standard.

It is well understood that aluminum can take various forms and the toxicity to aquatic life can be quite different depending on the form of aluminum. This calls into question the use of total aluminum as the standard and permit requirement. It has been suggested that acid-soluble or dissolved aluminum would be a more appropriate parameter to measure. Even using that approach, it is also well documented that aluminum toxicity varies widely depending on the water chemistry of the receiving water. Water hardness, pH and Total Organic Carbon are some parameters that are known to mitigate aluminum toxicity.

Response to Comment No. E1

The water quality criteria for aluminum to protect aquatic life uses are expressed as total recoverable aluminum. The limit is based on total recoverable aluminum because that is the aluminum that is available for biological uptake. Lethality and reproduction data are from the most sensitive life stages of the most sensitive species inhabiting the waterbody in question and used to determine the water quality criteria. In this case, striped bass was the limiting species, and its lowest observed effect concentration was 88µg/L. Therefore, the no observed effect concentration is 87µg/L.

Comment No. E.2

As recently as December 2017, at a meeting between EPA Region 1, MassDEP and Massachusetts public water suppliers, Region 1 representatives indicated they would not be issuing Water Treatment Plant NPDES permits with aluminum limits in the coming year. Instead, they seemed committed to letting the process of developing state standards and new aluminum criteria unfold before moving forward with new permit limits.

Response to Comment No. E.2

This comment refers to statements made by EPA Region 1 in December 2017 indicating they would not be issuing NPDES permits with aluminum limits to potable water treatment facilities in the coming year.

These statements referred only to potable water treatment facilities and not to the NPDES program as a whole.

Comment No. E.3

The permit does offer a reopener should MassDEP issue a new state water quality standard for aluminum. This reopener, however, puts the burden on the Town of Hudson to then request a permit modification to ". . . extend the compliance period for attaining the effluent limit for total aluminum beyond the original three (3) year period." This reopener clause should clearly state that anti-backsliding provisions will be waived once new water quality standards pertaining to aluminum are adopted by MassDEP.

Response to Comment No. E.3

EPA assumes Comment No. E.3 concerns the Maynard Permit rather than the Hudson Permit.

The reopener clause in the final Maynard Permit states that the anti-backsliding provisions will not be triggered if the aluminum limit is modified based on new water quality criteria prior to the limit of 274 µg/L going into effect.

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 Maynard, Massachusetts

is authorized to discharge from the facility located at

Maynard Water Pollution Control Facility
18 Pine Hill Road
Maynard, MA 01754

to receiving water named

Assabet River

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

This permit shall become effective on the first day of the calendar month immediately following 60 days after signature.[1]

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

This permit supersedes the permit issued on May 26, 2005.

This permit consists of **Part I (**17 pages including effluent limitations and monitoring requirements); **Attachment A** (Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages); **Attachment B** (Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013, 7 pages) and **Part II (**NPDES Part II Standard Conditions, April 2018, 21 pages).

Signed this day of

Ken Moraff, Director	Lealdon Langley, Director
Office of Ecosystem Protection	Massachusetts Wetlands and Wastewater Programs
Environmental Protection Agency	Department of Environmental Protection
Region 1	Commonwealth of Massachusetts
Boston, MA	Boston, MA

[1] Pursuant to 40 Code of Federal Regulations (C.F.R.) § 124.15(b)(3), if no comments requesting a change to the Draft Permit are received, the permit will become effective upon the date of signature.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent through Outfall Serial Number 001 to the Assabet River. The discharge shall be limited and monitored as specified below; the receiving water and the influent shall be monitored as specified below.

Effluent Characteristic	**Effluent Limitation**			**Monitoring Requirements[1,2,3]**	
	Average Monthly[4]	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[5]**
Effluent Flow[6]	1.45 MGD	---	Report MGD	Continuous	Recorder
Effluent Flow[6]	Report MGD	---	---	Continuous	Recorder
BOD_5	30 mg/L 363 lb/day	45mg/L 544 lb/day	Report mg/L	2/week	Composite
BOD_5 Removal	≥ 85 %	---	---	---	---
TSS	30 mg/L 363 lb/day	45 mg/L 544 lb/day	Report mg/L	2/week	Composite
TSS Removal	≥ 85 %	---	---	---	---
pH Range [7]	6.5 - 8.3 S.U.			2/day	Grab
Total Residual Chlorine [8,9]	73 µg/L	---	126 µg/L	2/day	Grab
Escherichia coli [8.9]	126 cfu/100 mL	---	409 cfu/100 mL	3/week	Grab
Aluminum[10,11]	274 ug/L	---	---	1/month	Composite
Total Copper[12]	0.037 mg/L	---	0.053 mg/L	1/month	Composite
Dissolved Oxygen (April 1 - October 31)	≥ 5.0 mg/L			1/day	Grab
Ammonia Nitrogen[13] (June 1-October 31)	12 mg/L Report lb/day	---	Report, mg/L	2/week	Composite
Ammonia Nitrogen[13] (November 1-May 31)	Report mg/L Report lb/day	---	Report mg/L	1/week	Composite
Total Kjeldahl Nitrogen[13]	Report mg/L Report lb/day	---	Report mg/L	1/quarter	Composite

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly[4]	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[5]
Total Nitrate[13]	Report mg/L Report lb/day	---	Report mg/L	1/quarter	Composite
Total Nitrite[13]	Report mg/L Report lb/day	---	Report mg/L	1/quarter	Composite
Total Nitrogen[13]	Report mg/L Report lb/day	---	Report mg/L	1/quarter	Composite
Total Phosphorus (April 1 - October 31)	0.1 mg/L Report lb/day	---	Report lb/day	3/week	Composite
Total Phosphorus (November 1 - March 31)	0.2 mg/L Report lb/day	---	Report mg/L	1/week	Composite
Whole Effluent Toxicity (WET) Testing[15,16,17]					
LC_{50}	---	---	≥ 100 %	1/quarter	Composite
C-NOEC	---	---	≥ 15 %	1/quarter	Composite
Hardness	---	---	Report mg/L	1/quarter	Composite
Ammonia Nitrogen	---	---	Report mg/L	1/quarter	Composite
Total Aluminum	---	---	Report mg/L	1/quarter	Composite
Total Cadmium[14]	---	---	Report mg/L	1/quarter	Composite
Total Copper	---	---	Report mg/L	1/quarter	Composite
Total Nickel	---	---	Report mg/L	1/quarter	Composite
Total Lead	---	---	Report mg/L	1/quarter	Composite
Total Zinc	---	---	Report mg/L	1/quarter	Composite

Characteristic	Required Analysis			Monitoring Requirements[1,2,3]	
	Average Monthly[4]	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[5]
Receiving Water Chemical Analysis[16,17]					
Hardness	---	---	Report mg/L	1/quarter	Grab
Ammonia Nitrogen	---	---	Report mg/L	1/quarter	Grab
Total Aluminum	---	---	Report mg/L	1/quarter	Grab
Total Cadmium	---	---	Report mg/L	1/quarter	Grab
Total Copper	---	---	Report mg/L	1/quarter	Grab
Total Nickel	---	---	Report mg/L	1/quarter	Grab
Total Lead	---	---	Report mg/L	1/quarter	Grab
Total Zinc	---	---	Report mg/L	1/quarter	Grab
pH [18]	---	---	Report S.U.	1/quarter	Grab
Temperature[18]	---	---	Report °C	1/quarter	Grab
Influent Monitoring					
BOD_5	Report mg/L	---	---	2/month	Composite
TSS	Report mg/L	---	---	2/month	Composite

Table Footnotes:

1. Effluent samples shall be taken at a location that yields data representative of the discharge. 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. The Permittee shall submit the results to the Environmental Protection Agency Region 1 (EPA) and the State of any additional testing above that required herein, if testing is in accordance with 40 C.F.R. § 136.

2. In accordance with 40 C.F.R. § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 C.F.R. Part 136 or required under 40 C.F.R. Chapter I, Subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 C.F.R. Part 136 or required under 40 C.F.R. Chapter I, Subchapter N or O for the measured pollutant or pollutant parameter. The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

3. When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L).

4. In calculating and reporting the average monthly concentration when the pollutant is not detected, assign zero to the non-detected sample result if the pollutant was not detected for all monitoring periods in the prior twelve months. If the pollutant was detected in at least one monitoring period in the prior twelve months, then assign each non-detected sample result a value that is equal to one half of the minimum level of detection for the purposes of calculating averages.

5. Each composite sample 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. Report annual average, monthly average, and the maximum daily flow in million gallons per day (MGD). 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.

7. The pH shall be within the specified range at all times. The minimum and maximum pH sample measurement values for the month shall be reported in standard units (S.U.).

8. The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. Monitoring for total residual chlorine (TRC) is only required for discharges which have been previously chlorinated or which contain residual chlorine. For the purposes of this permit, TRC analysis must be completed using a test method in 40 C.F.R. § 136 that achieves a minimum level no greater than 20 µg/L. The compliance level for TRC is 20 µg/L.

   Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

9. The monthly average limit for *E. coli* is expressed as a geometric mean. *E. coli* monitoring shall be conducted concurrently with TRC monitoring if TRC monitoring is required.

10. See **Special Conditions, Part G**

11. Aluminum analysis must be completed using a test method in 40 C.F.R. § 136 that achieves a minimum level no greater than 87 µg/L.

12. Copper analysis must be completed using a test method in 40 C.F.R. § 136 that achieves a minimum level no greater than 3 µg/L.

13. Ammonia nitrogen, total Kjeldahl nitrogen, total nitrate and nitrite nitrogen samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen (total nitrogen = total Kjeldahl nitrogen + total nitrate/nitrite nitrogen). The total nitrogen loading values reported each quarter shall be calculated as follows: Total Nitrogen (lbs/day) = [(average monthly total nitrogen concentration (mg/L) * total monthly influent flow (Millions of Gallons (MG)) / # of days in the month] *8.34.

14. Cadmium analysis must be completed using a test method in 40 C.F.R. § 136 that achieves a minimum level no greater than 0.2 µg/L.

15. The Permittee shall conduct acute toxicity tests (LC_{50}) and chronic toxicity tests (C-NOEC) in accordance with test procedures and protocols specified in **Attachment A and B** of this permit. LC_{50} and C-NOEC are defined in Part II.E. of this permit. The Permittee shall test the daphnid, *Ceriodaphnia dubia*, only. Toxicity test samples shall be collected and tests completed during the same weeks each month of calendar quarters ending in March 31st, June 30th, September 30th, and December 31st. The complete report for each toxicity test shall be submitted as an attachment to the monthly DMR submittal immediately following the completion of the test.

16. For Part I.A.1., Whole Effluent Toxicity Testing, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the effluent sample. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the Permittee shall follow procedures outlined in **Attachment A and B**, Section IV., DILUTION WATER. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

17. For Part I.A.1., Ambient Characteristic, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the receiving water sample collected as part of the WET testing requirements. Such samples shall be taken from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location, as specified in **Attachment A and B**. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

18. A pH and temperature measurement shall be taken of each receiving water sample at the time of collection and the results reported on the appropriate DMR. These pH and temperature measurements are independent from any pH and temperature measurements required by the WET testing protocols.

Part I.A. continued.

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

3. The discharge shall be free from pollutants in concentrations or combinations that, in the receiving water, settle to form objectionable deposits; float as debris, scum or other matter to

form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

4. The discharge shall be free from pollutants in concentrations or combinations that adversely affect the physical, chemical, or biological nature of the bottom.

5. The discharge shall not result in pollutants in concentrations or combinations in the receiving water that are toxic to humans, aquatic life or wildlife.

6. The discharge shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to the receiving water.

7. The discharge shall be free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.

8. The Permittee must provide adequate notice to EPA-Region 1 and MassDEP - of the following:

    a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to § 301 or § 306 of the Clean Water Act if it were directly discharging those pollutants or in a primary industry category (see 40 C.F.R. §122 Appendix A as amended) discharging process water; and

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

    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.

9. Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

B. UNAUTHORIZED DISCHARGES

1. This permit authorizes discharges only from the outfall listed in Part I.A.1, in accordance with the terms and conditions 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 in accordance with Part D.1.e.(1) of the Standard Conditions of this permit (24-hour reporting).

2. Notification of SSOs to 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 (O&M) of the sewer system shall be in compliance with the Standard Conditions 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 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 O&M Plan

The Permittee shall develop and implement a Collection System O&M Plan.

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

(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 the State 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;
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow; and
(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 and co-permittee shall submit a summary report of activities related to the implementation of its Collection System O&M Plan during the previous calendar year. The report shall be submitted to EPA and the State annually by March 31. The first annual report is due the first March 31st following submittal of the collection system O&M Plan required by Part I.C.5.b. of this permit. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;

b. A map and a description of inspection and maintenance activities conducted and 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. 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; and

f. If the average annual flow in the previous calendar year exceeded 80 percent of the facility's design flow, or there have been capacity related overflows, the report shall include:

(1) Plans for further potential flow increases describing how the Permittee will maintain compliance with the flow limit and all other effluent limitations and conditions; and
(2) A calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year.

D. 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 works it owns and operates, as defined in Part II.E.1 of this permit.

E. INDUSTRIAL USERS

7. The Permittee shall submit to EPA and MassDEP the name of any Industrial User (IU) subject to Categorical Pretreatment Standards under 40 C.F.R. § 403.6 and 40 C.F.R. Chapter I, Subchapter N (§§ 405-415, 417-436, 439-440, 443, 446-447, 454-455, 457-461, 463-469, and 471 as amended) who commences discharge to the POTW after the effective date of this permit.

   This reporting requirement also applies to any other IU who discharges an average of 25,000 gallons per day or more of process wastewater into the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastewater which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW; or is designated as such by the Control Authority as defined in 40 C.F.R. § 403.12(a) on the basis that the industrial user has a reasonable potential to adversely affect the wastewater treatment facility's operation, or for violating any pretreatment standard or requirement (in accordance with 40 C.F.R. § 403.8(f)(6)).

8. In the event that the Permittee receives reports (baseline monitoring reports, 90-day compliance reports, periodic reports on continued compliance, etc.) from industrial users subject to Categorical Pretreatment Standards under 40 C.F.R. § 403.6 and 40 C.F.R. Chapter I, Subchapter N (§§ 405-415, 417-436, 439-440, 443, 446-447, 454-455, 457-461, 463-469, and 471 as amended), the Permittee shall forward all copies of these reports within ninety (90) days of their receipt to EPA and MassDEP.

F. 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 C.F.R. § 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to § 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 C.F.R. § 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 C.F.R. § 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 C.F.R. § 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 C.F.R. § 503.6.

5. The 40 C.F.R. § 503 requirements include 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 C.F.R. § 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]

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, as follows:

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 C.F.R. § 503.8.

[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

7. Under 40 C.F.R. § 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 C.F.R. § 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 § 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 C.F.R. § 503.9(r), for use or disposal, then the Permittee remains responsible to ensure that the applicable requirements in § 503 are met. 40 C.F.R. § 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 C.F.R. § 503 Subpart B.

8. The Permittee shall submit an annual report containing the information specified in the 40 C.F.R. § 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 electronically using EPA's Electronic Reporting tool ("NeT") (see "Reporting Requirements" section below).

G. SPECIAL CONDITIONS

Aluminum

The effluent limit for total aluminum shall be subject to a schedule of compliance whereby the limit takes effect three years after the effective date of the permit.[3] For the period starting on the effective date of this permit and ending three (3) years after the effective date, the permittee shall report only the monthly average aluminum concentration on the monthly DMR. After this initial three (3) year period, the permittee shall comply with the monthly average total aluminum limit of 274 µg/L ("final aluminum effluent limit"). The permittee shall submit an annual report due by January 15th of each of the first three (3) years of the permit that will detail its progress towards meeting the final aluminum effluent limit.

If during the three-year period after the effective date of the permit, Massachusetts adopts revised aluminum criteria, then the permittee may request a permit modification, pursuant to 40 C.F.R. § 122.62(a)(3), for a further delay in the effective date of the final aluminum effluent limits. If new criteria are approved by EPA before the effective date of the final aluminum effluent limit, the permittee may apply for a permit modification, pursuant to 40 C.F.R. § 122.62(a)(3), to revise the time to meet the final aluminum effluent limit and/or for revisions to the permit based on whether there is reasonable potential for the facility's aluminum discharge to cause or contribute to a violation of the newly approved aluminum criteria.

[3] The final effluent limit of 274 µg/l for aluminum may be modified prior to the end of the three-year compliance schedule if warranted by the new criteria and a reasonable potential analysis, and if consistent with anti-degradation requirements. Such a modification would not trigger anti-backsliding prohibitions, as reflected in CWA § 402(o) and 40 C.F.R. § 122.44(l), provided that such modification is finalized before the final limit takes effect.

H. REPORTING REQUIREMENTS

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 Using NetDMR

   The Permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and the State no later than the 15th day of the month electronically using NetDMR. When the Permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or the State. NetDMR is accessed from the internet at https://netdmr.zendesk.com/hc/en-us.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the Permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. *See* Part I.H.6. 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 Biosolids/Sewage Sludge Reports

   By February 19 of each year, the Permittee must electronically report their annual Biosolids/Sewage Sludge Report for the previous calendar year using EPA's NPDES Electronic Reporting Tool ("NeT") found on the internet at https://www.epa.gov/compliance/npdes-ereporting.

4. Submittal of Requests and Reports to EPA/OEP

   a. 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):

      (1) Transfer of permit notice;
      (2) Request for changes in sampling location;
      (3) Request for reduction in testing frequency;
      (4) Request for change in WET testing requirement;
      (5) Report on unacceptable dilution water / request for alternative dilution water for WET testing
      (6) Report of new industrial user commencing discharge; and
      (7) Report received from existing industrial user.

b. 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

5. Submittal of Reports in Hard Copy Form

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

(1) Written notifications required under Part II
(2) Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
(3) Collection System Operation and Maintenance Plan
(4) Report on annual activities related to O&M Plan

b. 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-SMR)
Boston, MA 02109-3912

6. State Reporting

Duplicate signed copies of all WET test reports shall be submitted to the Massachusetts Department of Environmental Protection, Division of Watershed Management, at the following address:

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Division of Watershed Management
8 New Bond Street
Worcester, Massachusetts 01606

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 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:

U.S. Environmental Protection Agency Office of Environmental Stewardship
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912
617-918-1850

and

Massachusetts Department of Environmental Protection
Central Regional Office
8 New Bond Street
Worcester, MA 01606
508-792-7650

MassDEP's Emergency Response 1-888-304-1133

I. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are 1) 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 2) 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 CMR 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 C.F.R. 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 EPA. 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.

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^{o}C.

IV. DILUTION WATER

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

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

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

and

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

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

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/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 TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

		series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

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

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

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each 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	$\geq$ 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.

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

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

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

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

No Observed Acute Effect Level (NOAEL)

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

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

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^{o} 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 ≥ 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.

Parameter	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 that 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

NPDES PART II STANDARD CONDITIONS
(April 26, 2018)[1]

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[1] Updated July 17, 2018 to fix typographical errors.

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 or Act) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

a. The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage 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, or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

b. Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (83 Fed. Reg. 1190-1194 (January 10, 2018) and the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note. See Pub. L.114-74, Section 701 (Nov. 2, 2015)). These requirements help ensure that EPA penalties keep pace with inflation. Under the above-cited 2015 amendments to inflationary adjustment law, EPA must review its statutory civil penalties each year and adjust them as necessary.

(1) Criminal Penalties

(a) *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than 2 years, or both.

(b) *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act 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. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

(c) *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing

endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

(d) *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further 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 non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(2) *Civil Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(3) *Administrative Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty as follows:

(a) *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(b) *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

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 a notification of planned changes or anticipated noncompliance does not stay any permit

condition.

3. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director 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 Director, upon request, copies of records required to be kept by this permit.

4. 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).

5. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

6. Confidentiality of Information

a. In accordance with 40 C.F.R. 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 C.F.R. 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.

c. Information required by NPDES application forms provided by the Director under 40 C.F.R. § 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.

7. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, 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 Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

8. State Authorities

Nothing in Parts 122, 123, or 124 precludes more stringent State regulation of any activity

covered by the regulations in 40 C.F.R. Parts 122, 123, and 124, whether or not under an approved State program.

9. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

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. 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 which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be 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 provisions of paragraphs (c) and (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. As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(2) *Unanticipated bypass*. The Permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (24-hour notice). As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or required to do so by law.

d. *Prohibition of bypass.*

(1) Bypass is prohibited, and the Director may take enforcement action against a Permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) 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

(c) The Permittee submitted notices as required under paragraph 4.c of this Section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 4.d of this Section.

5. Upset

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

improper operation.

b. *Effect of an upset.* An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph B.5.c. of this Section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

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

(1) An upset occurred and that the Permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated; and
(3) The Permittee submitted notice of the upset as required in paragraph D.1.e.2.b. (24-hour notice).
(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.

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 of 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 5 years (or longer as required by 40 C.F.R. § 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. This period may be extended by request of the Director 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 must be conducted according to test procedures approved under 40 C.F.R. § 136 unless another method is required under 40 C.F.R. Subchapters N or O.

e. The Clean Water Act provides that any person who falsifies, tampers with, or

knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The Permittee shall allow the Director, 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 Clean Water Act, any substances or parameters at any location.

D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. *Planned Changes*. The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only 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 C.F.R. § 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements at 40 C.F.R. § 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 that are 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 Director 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 Director. The Director may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the Clean Water Act. *See* 40 C.F.R. § 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. As of December 21, 2016 all reports and forms submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by State law.

(2) If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 C.F.R. § 136, or another method required for an industry-specific waste stream under 40 C.F.R. Subchapters N or O, the results of such 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 report shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written report 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. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all

reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(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 C.F.R. § 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 Director in the permit to be reported within 24 hours. *See* 40 C.F.R. § 122.44(g).

(3) The Director may waive the written report on a case-by-case basis for reports under paragraph D.1.e. of this Section if the oral report has been received within 24 hours.

f. *Compliance Schedules.* Reports of compliance or noncompliance with, or 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. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in paragraph D.1.e. and the applicable required data in Appendix A to 40 C.F.R. Part 127. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), §122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under 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 Director, it shall promptly submit such facts or information.

i. *Identification of the initial recipient for NPDES electronic reporting data*. The owner, operator, or the duly authorized representative of an NPDES-regulated entity is required to electronically submit the required NPDES information (as specified in Appendix A to 40 C.F.R. Part 127) to the appropriate initial recipient, as determined by EPA, and as defined in 40 C.F.R. § 127.2(b). EPA will identify and publish the list of initial recipients on its Web site and in the FEDERAL REGISTER, by state and by NPDES data group (see 40 C.F.R. § 127.2(c) of this Chapter). EPA will update and maintain this listing.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Director shall be signed and certified. *See* 40 C.F.R. §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 non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under paragraph A.6. 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 Director. 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.

E. DEFINITIONS AND ABBREVIATIONS

1. General Definitions

For more definitions related to sludge use and disposal requirements, see EPA Region 1's NPDES Permit Sludge Compliance Guidance document (4 November 1999, modified to add regulatory definitions, April 2018).

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 under the CWA, 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 or disposal" under Sections 301, 302, 303, 304, 306, 307, 308, 403 and 405 of the CWA.

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

"approved States," including any approved modifications or revisions.

Approved program or *approved State* means a State or interstate program which has been approved or authorized by EPA under Part 123.

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" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that 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.

Bypass see B.4.a.1 above.

C-NOEC or *"Chronic (Long-term Exposure Test) – No Observed Effect Concentration" means* 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.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 C.F.R. § 501.2, required to have an approved pretreatment program under 40 C.F.R. § 403.8 (a) (including any POTW located in a State that has elected to assume local program responsibilities pursuant to 40 C.F.R. § 403.10 (e)) and any treatment works treating domestic sewage, as defined in 40 C.F.R. § 122.2, classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved State programs, the Regional Administrator in conjunction with the State Director, because of the potential for its sewage sludge use or disposal practice to affect public health and the environment adversely.

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) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483and Public Law 97-117, 33 U.S.C. 1251 *et seq*.

CWA and regulations means the Clean Water Act (CWA) and applicable regulations promulgated thereunder. In the case of an approved State program, it includes State program requirements.

Daily Discharge means the "discharge of a pollutant" measured during a 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.

Direct Discharge means the "discharge of a pollutant."

Director means the Regional Administrator or an authorized representative. In the case of a permit also issued under Massachusetts' authority, it also refers to the Director of the Division of Watershed Management, Department of Environmental Protection, Commonwealth of Massachusetts.

Discharge

(a) When used without qualification, *discharge* means the "discharge of a pollutant."

(b) As used in the definitions for "interference" and "pass through," *discharge* means the introduction of pollutants into a POTW from any non-domestic source regulated under Section 307(b), (c) or (d) of the Act.

Discharge Monitoring Report ("DMR") means the EPA uniform 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.

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Director 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."

Environmental Protection Agency ("EPA") means the United States Environmental Protection

Agency.

Grab Sample means an individual sample collected in a period of less than 15 minutes.

Hazardous substance means any substance designated under 40 C.F.R. Part 116 pursuant to Section 311 of CWA.

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

Indirect discharger means a nondomestic discharger introducing "pollutants" to a "publicly owned treatment works."

Interference means a discharge (see definition above) 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, 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 that is not a land application unit, surface impoundment, injection well, or waste pile.

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

LC_{50} means 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.

Maximum daily discharge limitation means the highest allowable "daily discharge."

Municipal solid waste landfill (MSWLF) unit means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 C.F.R. § 257.2. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, very small quantity generator waste and industrial solid waste. Such a landfill may be

publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion. A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit.

Municipality

(a) When used without qualification *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 tribal organization, or a designated and approved management agency under Section 208 of CWA.

(b) As related to sludge use and disposal, *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.

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 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 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 Director 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 Director shall consider the factors specified in 40 C.F.R. §§ 125.122 (a) (1) through (10).

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

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

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

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

NPDES means "National Pollutant Discharge Elimination System."

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

Pass through means a Discharge (see definition above) 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).

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

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved State" to implement the requirements of Parts 122, 123, and 124. "Permit" includes an NPDES "general permit" (40 C.F.R § 122.28). "Permit" does not include any permit which has not yet been the subject of final agency action, such as a "draft permit" or "proposed permit."

Person means 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 measured at 25° Centigrade or measured at another temperature and then converted to an equivalent value at 25° Centigrade.

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 C.F.R. § 122.3).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials

(except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq*.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

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

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

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operator is not the operator of the treatment works and (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 a treatment works as defined by Section 212 of the Act, which is owned by a State or municipality (as defined by Section 504(4) of the Act). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in Section 502(4) of the Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

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

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

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, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced waste water treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 C.F.R. Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge 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 C.F.R. § 122.2.

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; finished materials such as metallic products; 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 Section 313 of title III of SARA; 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 C.F.R. §§ 110.10 and 117.21) or Section 102 of CERCLA (*see* 40 C.F.R. § 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 C.F.R. § 122.1(b)(2).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, or an Indian Tribe as defined in the regulations which meets the requirements of 40 C.F.R. § 123.31.

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.

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 that is used for collecting and conveying storm water and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

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

Toxic pollutant 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 waste water 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 waste water 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 Director may designate any person subject to the standards for sewage sludge use and

disposal in 40 C.F.R. 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 C.F.R. Part 503.

Upset see B.5.a. above.

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

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

Waters of the United States or waters of the U.S. 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 the 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 CWA (other than cooling ponds as defined in 40 C.F.R. § 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland.

Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient 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.

*Zone of Initial Dilution (*ZID) means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards.

2. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)
TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont.	Continuous 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
Surfactant	Surface-active agent
Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
µg/L	Microgram(s) per liter
WET	"Whole effluent toxicity"
ZID	Zone of Initial Dilution

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO THE CLEAN WATER ACT (CWA)

NPDES PERMIT NUMBER: MA0101001

PUBLIC NOTICE START AND END DATES: October 25, 2018 – November 23, 2018

NAME AND MAILING ADDRESS OF APPLICANT:

Aaron Miklosko, Director
Town of Maynard
Department of Public Works
195 Main Street
Maynard, MA 01754

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Maynard Water Pollution Control Facility
18 Pine Hill Road
Maynard, MA 01754

RECEIVING WATER AND CLASSIFICATION:

Assabet River (MA82B-06)
Class B - Warm Water Fishery

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APPENDICES

1 Proposed Action

The above named applicant (the "Permittee") has applied to the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge from the Treatment Plant (the "Facility") into the designated receiving water.

The permit currently in effect was issued on May 26, 2005 with an effective date of November 1, 2005 and expired on October 31, 2010 (the "2005 Permit"). The Permittee filed an application for permit reissuance with EPA dated June 3, 2010, as required by 40 Code of Federal Regulations (C.F.R.) § 122.6. Since the permit application was deemed timely and complete by EPA on November 10, 2010 the Facility's 2005 Permit has been administratively continued pursuant to 40 C.F.R. § 122.6 and § 122.21(d). EPA and the State conducted a site visit on April 12, 2017.

This NPDES Permit is issued jointly by EPA and MassDEP under federal and state law, respectively. As such, all the terms and conditions of the permit are, therefore, incorporated into and constitute a discharge permit issued by the Director of the Massachusetts Wetlands and Wastewater Programs pursuant to M.G.L. Chap. 21, § 43.

2 Statutory and Regulatory Authority

Congress enacted the Clean Water Act (CWA), "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." *See* CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except as authorized by specific permitting sections of the CWA, one of which is § 402. *See* CWA §§ 303(a), 402(a). Section 402(a) established one of the CWA's principal permitting programs, the NPDES Permit Program. Under this section, EPA may "issue a permit for the discharge of any pollutant or combination of pollutants" in accordance with certain conditions. *See* CWA § 402(a). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. *See* CWA § 402(a)(1) and (2). The regulations governing EPA's NPDES permit program are generally found in 40 C.F.R. §§ 122, 124, 125, and 136.

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" effluent limitations (TBELs) and "water quality-based" effluent limitations (WQBELs). *See* CWA §§ 301, 304(b); 40 C.F.R. §§ 122, 125, and 131.

2.1 Technology-Based Requirements

Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted. *See* CWA § 301(b). As a class, publicly owned treatment works (POTWs) must meet performance-based requirements based on available wastewater treatment technology. *See* CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of BOD_5, TSS and pH. *See* 40 C.F.R. § 133.

Under § 301(b)(1) of the CWA, POTWs must have achieved effluent limits based upon secondary treatment technology by July 1, 1977. Since all statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired, when technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. *See* 40 C.F.R. § 125.3(a)(1).

2.2 Water Quality Based Requirements

The CWA and federal regulations require that effluent limitations based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water. This is necessary when less stringent TBELs would interfere with the attainment or maintenance of water quality criteria in the receiving water. *See* § 301(b)(1)(C) of the CWA and 40 C.F.R. §§ 122.44(d)(1) and 122.44(d)(5).

2.2.1 Water Quality Standards

The CWA requires that each state develop water quality standards (WQSs) for all water bodies within the State. *See* CWA § 303 and 40 C.F.R. § 131.10-12. Generally, WQSs consist of three parts: 1) beneficial designated use or uses for a water-body or a segment of a water-body; 2) numeric or narrative water quality criteria sufficient to protect the assigned designated use(s); and 3) anti-degradation requirements to ensure that once a use is attained it will not be degraded and to protect high quality and National resource waters. *See* CWA § 303(c)(2)(A) and 40 C.F.R. § 131.12. The applicable State WQSs can be found in Title 314 of the Code of Massachusetts Regulations, Chapter 4 (314 CMR 4.00).

Receiving water requirements are established according to numerical and narrative standards in WQSs adopted under State law for each water body classification. When using chemical-specific numeric criteria to develop permit limits, acute and chronic aquatic life criteria and human health criteria are used and expressed in terms of maximum allowable in-stream pollutant concentrations. In general, aquatic-life acute criteria are considered applicable to daily time periods (maximum daily limit) and aquatic-life chronic criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific human health criteria are typically based on lifetime chronic exposure and are therefore typically applicable to monthly average limits.

When permit effluent limits are necessary for a pollutant to meet narrative water quality criteria, the permitting authority must establish effluent limits in one of three ways: based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use," on a "case-by-case basis" using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, in certain circumstances, based on an indicator parameter. *See* 40 C.F.R. § 122.44(d)(1)(vi)(A-C).

2.2.2 Anti-degradation

Federal regulations found at 40 C.F.R. § 131.12 require states to develop and adopt a statewide anti-degradation policy that maintains and protects existing in-stream water uses and the level of water quality necessary to protect these existing uses. In addition, the anti-degradation policy ensures that high quality waters which exceed levels necessary to support propagation of fish, shellfish, and wildlife and support recreation in and on the water, are maintained unless the State finds that allowing degradation is necessary to accommodate important economic or social development in the area in which the waters are located.

Massachusetts' statewide anti-degradation policy, entitled "Antidegradation Provisions", is found in the State's WQSs at 314 CMR 4.04. Massachusetts guidance for the implementation of this policy is in an associated document entitled "Implementation Procedure for the Antidegradation Provisions of the State Water Quality Standards", dated October 21, 2009. According to the policy, no lowering of water quality is allowed, except in accordance with the anti-degradation policy, and all existing in-stream uses and the level of water quality necessary to protect the existing uses of a receiving water must be maintained and

protected.

This permit is being reissued with effluent limitations sufficiently stringent to protect the existing uses of the receiving water.

2.2.3 Assessment and Listing of Waters and Total Maximum Daily Loads.

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 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 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.

A TMDL is a planning tool and potential starting point for restoration activities with the goal of attaining water quality standards. A TMDL is essentially a pollution budget designed to restore the health of an impaired water body. A TMDL typically identifies the source(s) of the pollutant from direct and indirect discharges, determines the maximum load of the pollutant that can be discharged to a specific water body while maintaining WQSs for designated uses, and allocates that load to the various pollutant sources, including point source discharges, subject to NPDES permits. *See* 40 C.F.R. § 130.7.

For impaired waters where a TMDL has been developed for a particular pollutant and the TMDL includes a waste load allocation for a NPDES permitted discharge, the effluent limit in the permit may not exceed the waste load allocation. *See* 40 C.F.R. § 122.44(d)(1)(vii)(B).

2.2.4 Reasonable Potential

Pursuant to 40 C.F.R. § 122.44(d)(1), NPDES permits must contain any requirements in addition to TBELs necessary to achieve water quality standards established under § 303 of the CWA. In addition, limitations "must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality". *See* 40 C.F.R. § 122.44(d)(1)(i). There is reasonable potential to cause or contribute to an excursion if the projected or actual in-stream concentration exceeds the applicable criterion. If the permitting authority determines that a discharge causes, has the reasonable potential to cause, or contributes to such an excursion, the permit must contain WQBELs for the pollutant. *See* 40 C.F.R. 122.44(d)(1)(iii).

In determining reasonable potential, EPA considers: 1) existing controls on point and non-point sources of pollution; 2) the variability of the pollutant or pollutant parameter in the effluent; 3) the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity); and 4) where appropriate, the dilution of the effluent in the receiving water. EPA typically considers the statistical approach outlined in

Technical Support Document for Water Quality-based Toxics Control (TSD)[1] to determine if the discharge causes, or has the reasonable potential to cause, or contribute to an excursion above any WQS. *See* 40 C.F.R. § 122.44(d). EPA's quantitative approach statistically projects effluent concentrations based on available effluent data, which are then compared to the applicable WQC.

2.2.5 State Certification

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate the State WQSs or it is deemed that the state has waived its right to certify. Regulations governing state certification are set forth in 40 C.F.R. § 124.53 and § 124.55. EPA has requested permit certification by the State pursuant to 40 C.F.R. § 124.53 and expects that the Draft Permit will be certified.

If the State believes that any conditions more stringent than those contained in the Draft Permit are necessary to meet the requirements of either the CWA §§ 208(e), 301, 302, 303, 306 and 307 and with appropriate requirements of State law, the State should include such conditions and, in each case, cite the CWA or State law reference upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition. The only exception to this is that the sludge conditions/requirements implementing § 405(d) of the CWA are not subject to the § 401 State Certification requirements. Reviews and appeals of limitations and conditions attributable to State certification shall be made through the applicable procedures of the State and may not be made through the applicable procedures of 40 C.F.R. § 124.

In addition, the State should provide a statement of the extent to which any condition of the Draft Permit can be made less stringent without violating the requirements of State law. Since the State's certification is provided prior to permit issuance, any failure by the State to provide this statement waives the State's right to certify or object to any less stringent condition.

It should be noted that under CWA § 401, EPA's duty to defer to considerations of state law is intended to prevent EPA from relaxing any requirements, limitations or conditions imposed by state law. Therefore, "[a] State may not condition or deny a certification on the grounds that State law allows a less stringent permit condition." *See* 40 C.F.R. § 124.55(c). In such an instance, the regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." *Id.* EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 C.F.R. § 122.4 (d) and 40 C.F.R. § 122.44(d).

2.3 Effluent Flow Requirements

Sewage treatment plant discharge is encompassed within the definition of "pollutant" and is subject to regulation under the CWA. The CWA defines "pollutant" to mean, *inter alia*, "municipal...waste" and "sewage…discharged into water." 33 U.S.C. § 1362(6).

EPA may use design flow of wastewater effluent both to determine the necessity for effluent limitations in the permit that comply with the Act, and to calculate the limits themselves. EPA practice is to use design flow as a reasonable and important worst-case condition in EPA's reasonable potential and WQBEL calculations to ensure compliance with WQSs under § 301(b)(1)(C). Should the wastewater

[1] March 1991, EPA/505/2-90-001

effluent flow exceed the flow assumed in these calculations, the instream dilution would decrease and the calculated effluent limits may not be protective of WQSs. Further, pollutants that do not have the reasonable potential to exceed WQSs at the lower wastewater discharge flow may have reasonable potential at a higher flow due to the decreased dilution. To ensure that the assumptions underlying the Region's reasonable potential analyses and derivation of permit effluent limitations remain sound for the duration of the permit, the Region may ensure its "worst-case" wastewater effluent flow assumption through imposition of permit conditions for wastewater effluent flow. Thus, the wastewater effluent flow limit is a component of WQBELs because the WQBELs are premised on a maximum level of flow. In addition, the wastewater effluent flow limit is necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQSs.

Using a facility's design flow in the derivation of pollutant effluent limitations, including conditions to limit wastewater effluent flow, is consistent with, and anticipated by NPDES permit regulations. Regarding the calculation of effluent limitations for POTWs, 40 C.F.R. § 122.45(b)(1) provides, "permit effluent limitations…shall be calculated based on design flow." POTW permit applications are required to include the design flow of the treatment facility. *Id.* § 122.21(j)(1)(vi).

Similarly, EPA's reasonable potential regulations require EPA to consider "where appropriate, the dilution of the effluent in the receiving water," 40 C.F.R. § 122.44(d)(1)(ii), which is a function of *both* the wastewater effluent flow and receiving water flow. EPA guidance directs that this "reasonable potential" analysis be based on "worst-case" conditions. EPA accordingly is authorized to carry out its reasonable potential calculations by presuming that a plant is operating at its design flow when assessing reasonable potential.

The limitation on wastewater effluent flow is within EPA's authority to condition a permit in order to carry out the objectives of the Act. *See* CWA §§ 402(a)(2) and 301(b)(1)(C); 40 C.F.R. §§ 122.4(a) and (d); 122.43 and 122.44(d). A condition on the discharge designed to protect EPA's WQBEL and reasonable potential calculations is encompassed by the references to "condition" and "limitations" in 402 and 301 and implementing regulations, as they are designed to assure compliance with applicable water quality regulations, including anti-degradation. Regulating the quantity of pollutants in the discharge through a restriction on the quantity of wastewater effluent is consistent with the overall structure and purposes of the CWA.

In addition, as provided in Part II.B.1 of this permit and 40 C.F.R. § 122.41(e), the permittee is required to properly operate and maintain all facilities and systems of treatment and control. Operating the facilities wastewater treatment systems as designed includes operating within the facility's design wastewater effluent flow. Thus, the permit's wastewater effluent flow limitation is necessary to ensure proper facility operation, which in turn is a requirement applicable to all NPDES permits. *See* 40 C.F.R. § 122.41.

EPA has also included the wastewater effluent flow limit in the permit to minimize or prevent infiltration and inflow (I/I) that may result in unauthorized discharges and compromise proper operation and maintenance of the facility. Improper operation and maintenance may result in non-compliance with permit effluent limitations. Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes or deteriorated joints. Inflow is extraneous flow added to the collection system that enters the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity available for treatment and the operating efficiency of the treatment works and to properly operate and maintain the treatment works.

Furthermore, the extraneous flow due to significant I/I greatly increase the potential for sanitary sewer

overflows (SSOs) in separate systems. Consequently, the effluent flow limit is a permit condition that relates to the permittee's duty to mitigate (*i.e.*, minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment) and to properly operate and maintain the treatment works. *See* 40 C.F.R. §§ 122.41(d) and (e).

2.4 Monitoring and Reporting Requirements

2.4.1 Monitoring Requirements

EPA has the authority in accordance with several statutory and regulatory requirements established pursuant to the CWA, 33 USC § 1251 et seq., the NPDES program (*See* § 402 and the implementing regulations generally found at 40 C.F.R. §§ 122, 124, 125, and 136), CWA § 308(a), 33 USC § 1318(a), and applicable state regulations to include requirements such as monitoring and reporting in NPDES permits.

The monitoring requirements included in this permit have been established to yield data representative of the discharges under the authority of §§ 308(a) and 402(a)(2) of the CWA, and consistent with 40 C.F.R. §§ 122.41(j), 122.43(a), 122.44(i) and 122.48. The monitoring requirements included in this permit specify routine sampling and analysis, which will provide ongoing, representative information on the levels of regulated constituents in the wastewater discharge streams. The monitoring program is needed to assess effluent characteristics, evaluate permit compliance, and determine if additional permit conditions are necessary to ensure compliance with technology-based and water quality-based requirements, including WQSs. EPA and/or the state may use the results of the chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to § 304(a)(1) of the 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 C.F.R. § 122. Therefore, the monitoring requirements in this permit are included for specific regulatory use in carrying out the CWA.

NPDES permits require that the approved analytical procedures found in 40 C.F.R. § 136 be used for sampling and analysis unless other procedures are explicitly specified. Permits also include requirements necessary to comply with the *National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting Rule*.[2] This Rule requires that where EPA-approved methods exist, NPDES applicants must use sufficiently sensitive EPA-approved analytical methods when quantifying the presence of pollutants in a discharge. Further, the permitting authority must prescribe that only sufficiently sensitive EPA-approved methods be used for analyses of pollutants or pollutant parameters under the permit. The NPDES regulations at 40 C.F.R. § 122.21(e)(3) (completeness), 40 C.F.R. § 122.44(i)(1)(iv) (monitoring requirements) and/or as cross referenced at 40 C.F.R. § 136.1(c) (applicability) indicate that an EPA-approved method is sufficiently sensitive where:

- The method minimum level[3] (ML) is at or below the level of the applicable water quality

[2] Federal Register, Vol. 79, No. 160, Tuesday, August 19, 2014; FR Doc. 2014–19557.

[3] The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL). Minimum levels may be obtained in several ways: They may be published in a method; they may be sample concentrations equivalent to the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined

criterion or permit limitation for the measured pollutant or pollutant parameter; or

- In the case of permit applications, the ML is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or parameter in the discharge; or
- The method has the lowest ML of the EPA-approved analytical methods.

2.4.2 Reporting Requirements

The Draft Permit requires the Permittee to electronically report monitoring results obtained during each calendar month as a Discharge Monitoring Report (DMR) to EPA and the State using NetDMR no later than the 15th day of the month following the completed reporting period.

NetDMR is a national web-based tool for regulated CWA permittees to submit DMRs electronically via a secure internet application to EPA through the Environmental Information Exchange Network. NetDMR has allowed participants to discontinue mailing in hard copy forms to EPA under 40 C.F.R. §§ 122.41 and 403.12. NetDMR is accessed from the following website: https://netdmr.zendesk.com/hc/en-us. Further information about NetDMR can be found on the EPA Region 1 NetDMR website.[4]

With the use of NetDMR, the Permittee is no longer required to submit hard copies of DMRs and reports to EPA and the State unless otherwise specified in the Draft Permit. In most cases, reports required under the permit shall be submitted to EPA as an electronic attachment through NetDMR. Certain exceptions are provided in the permit, such as for providing written notifications required under the Part II Standard Conditions.

2.5 Anti-backsliding

A permit may not be renewed, reissued or modified with less stringent limitations or conditions than those contained in a previous permit unless in compliance with the anti-backsliding requirements of the CWA. See §§ 402(o) and 303(d)(4) of the CWA and 40 C.F.R. § 122.44(l)(1 and 2). Anti-backsliding provisions apply to effluent limits based on technology, water quality, BPJ and state certification requirements.

All proposed limitations in the Draft Permit are at least as stringent as limitations included in the 2005 Permit unless specific conditions exist to justify one of the exceptions listed in 40 C.F.R. § 122.44(l)(2)(i) and/or in accordance with § 303(d)(4). Discussion of any applicable exceptions are discussed in sections that follow. Therefore, the Draft Permit complies with the anti-backsliding requirements of the CWA.

3 Description of Facility and Discharge

3.1 Location and Type of Facility

The location of the treatment plant and outfall 001 to the Assabet River are shown in Figure 1. The latitude and longitude of the outfall is 71^0 26' 12.7", 42^0 26' 23.3".

The Maynard Water Pollution Control Facility (WPCF) is an advanced wastewater treatment facility that

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by a lab, by a factor. EPA is considering the following terms related to analytical method sensitivity to be synonymous: "quantitation limit," "reporting limit," "level of quantitation," and "minimum level." *See* Federal Register, Vol. 79, No. 160, Tuesday, August 19, 2014; FR Doc. 2014–19557.

[4] https://netdmr.zendesk.com/hc/en-us/articles/209616266-EPA-Region-1-NetDMR-Information.

is engaged in the collection and treatment of municipal wastewater. Currently, the Facility serves approximately 10,000 residents in the Town of Maynard.

The Facility has a design flow of 1.45 MGD, the annual average daily flow reported in the 2010 permit application was 1.17 MGD and the average for the 5 year period was 0.89 MGD. The system is a separate system with no combined sewers. Wastewater is comprised of mostly domestic sewage with some commercial sewage and additional septage. There are no significant industrial users.

A quantitative description of the discharge in terms of effluent parameters, based on monitoring data submitted by the permittee from October 2012 through October 2017 is provided in Appendix A of this Fact Sheet.

3.1.1 Treatment Process Description

The Town completed extensive upgrades at the treatment plant in 2011 and the facility now provides tertiary treatment of the wastewater. There are no significant industrial users contributing wastewater to the plant. The collection system consists of separate sewers so there are no combined sewer overflows (CSOs).

Pretreatment consists of raw wastewater passing through mechanical screens to remove large debris and then a grit removal system. Approximately 0.5 cubic feet of grit is collected and disposed of each day. After the grit is removed, the influent flow is measured for process control as it passes through a Parshall flume. Soda ash is added to the influent manually for pH control followed by the addition of polyaluminum chloride (PAC). The PAC is added for coagulation to improve settling in the primary clarifier.

Primary treatment consists of wastewater flowing into one of three primary clarifiers for removal of settled solids and scum. Secondary treatment occurs in three trains of multi-stage Rotating Biological Contractor (RBC) units. The first stage in the RBC train is for carbonaceous biochemical oxygen demand ($CBOD_5$) removal and the second and third stages are for nitrogenous biochemical oxygen demand (NBOD) removal. After RBC treatment, approximately 10 gallons per day of soda ash is added for pH control and PAC is injected after the RBC units for improved settling in the secondary clarifiers. The effluent then flows to one of two secondary clarifiers. Effluent from the secondary clarifiers flows to the tertiary treatment facility and sludge from the secondary clarifier is returned to the primary clarifier.

The Town added a two-train CoMag system that went on-line in February 2011 to provide tertiary treatment. 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. It provides effluent polishing and removes additional phosphorus. Magnetite in the form of a “magnetic ballast seed” is mixed with wastewater after the addition of PAC and polymer to increase flocculation and settling rates prior to filtration. Sludge from the CoMag process is returned to the primary clarifiers.

The final effluent flows through the chlorine contact chamber for disinfection using sodium hypochlorite and the flow is recorded at a Parshall flume. The flow reading from this Parshall flume is reported on the facility’s monthly discharge monitoring reports (DMRs). Sulfur dioxide gas is injected for dechlorination and the facility includes three chlorine residual analyzers to continuously monitor the chlorination/dechlorination system. The final effluent flows over a cascade where it is aerated prior to discharge into the Assabet River. A process flow diagram of the treatment facility is shown in Figure 2.

Mixed sludge accumulated from the treatment process is thickened and sent to a tanker truck before being hauled off-site by a contractor to the Greater Lawrence Sanitary District (GLSD). The sludge is stabilized

at the GLSD and then sent to a thermal drying process. The total sludge generated from the Maynard WPCF and shipped off-site in 2016 was 297.91 metric dry tons.

3.1.2 Collection System Description

The collection system serves approximately 95% of the Town and consists of 40 miles of separated sewers with force main ranging from 6 to 24 inches. There are twelve sewage pump stations of various sizes and types. The Powder Mill Road pumping station pumps 50% of the flow to the wastewater treatment plant system.

4 Description of Receiving Water and Dilution

The Maynard WPCF discharges through outfall 001 into the Assabet River, segment ID number, MA82B-06. This segment of the river is 1.2 miles in length and flows from the United States Geologic Survey (USGS) Gage # 01097000 at Routes 27/62 in Maynard to the Powder Mill Dam in Acton, MA. Assabet River segment, MA82B-07 flows from Powder Mill Dam to the confluence of the Sudbury River in Concord, MA. The Sudbury River is part of the Sudbury Assabet Concord (SuAsCo) Watershed, joining the Assabet River to form the Concord River downstream of Maynard. The Concord River flows to the Merrimack River and eventually discharges to the Atlantic Ocean in Newburyport, MA.

The Assabet River is classified as a Class B warm water fishery in the Massachusetts WQSs, 314 Code of Massachusetts Regulations ("CMR") 4.06(5). The MA WQS at 314 CMR 4.05(3)(b) state that 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. They shall be a source of public water supply (i.e., where designated and with appropriate treatment). They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. They shall also have consistently good aesthetic value.*"

A summary of the ambient data collected in the receiving water upstream of the outfall can be found in Appendix B of this Fact Sheet.

The MassDEP's Massachusetts Year 2014 Integrated List of Waters (2014 Integrated List), the 303(d) list, includes segment MA82B-06 of the Assabet River as a Massachusetts Category 5 Water. This assessment is based on the sampling results of water quality monitoring by the USGS and an annual visual assessment conducted by MassDEP from 2009 through 2013.

MassDEP has identified the following impairments for segment MA82B-06 of the Assabet River: total phosphorus, dissolved oxygen, excess algal growth, temperature, aquatic plants (macrophytes), non-native aquatic plants and, unspecified metals and priority organics. To date a 2004 TMDL for Total Phosphorus has been completed for this segment of the river to address the total phosphorus, dissolved oxygen, excess algal growth and aquatic plant (macrophyte) impairments. The goal of the TMDL is to decrease the instream concentration of total phosphorus to mitigate some of the ecological effects of eutrophication on the river; these effects were, for the most part, direct consequences of the excessive growth of aquatic macrophytes. This TMDL can be located at http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/anuttmdl.pdf.

4.1 Available Dilution

7 Day, 10 Year Low Flow

To ensure that discharges do not cause or contribute to violations of WQS under all expected

circumstances, WQBELs are derived assuming critical conditions for the receiving water (*See* EPA Permit Writer's Manual, Section 6.2.4). For most pollutants and criteria, the critical flow in rivers and streams is some measure of the low flow of that river or stream. Massachusetts water quality regulations require that the available effluent dilution be based on the 7 day, 10-year low flow (7Q10 flow) of the receiving water (314 CMR 4.03(3)(1)). The 7Q10 low flow is the mean low flow over 7 consecutive days, recurring every 10 years.

The 7Q10 flow used in the Draft Permit is 12.67 cfs from the Maynard gage station, 01097000. It was calculated using EPA's DFLOW program based on daily flow data from the USGS website at https://waterdata.usgs.gov/ma/nwis/dv/?site_no=01097000&PARAmeter_cd=00060,00065 for the period of April 1, 1986 to March 31, 2016.

The drainage area at the Maynard gage station is 116 square miles ($mi.^2$), per USGS Streamstats. The drainage area used in the Draft Permit is 109 $mi.^2$ The drainage area at the USGS gage includes the drainage area of the headwater impoundment known as A-1 Impoundment, however during low flow conditions this impoundment has no outflow. Therefore, EPA excluded the area draining to the headwater impoundment (an estimated 6.88 $mi.^2$ in the calculation of the design dilution flow) for the Draft ermit.

7Q10 at USGS gage station 01097000 – Assabet River in Maynard, MA, April 1, 1986-March 31, 2016.

= 12.667 cubic feet per second (cfs)

Contributing low flows in July 2016 from the three wastewater treatment plants upstream of the Maynard WPCF are shown below.

Westborough POTW = 7.88 cfs
Marlborough POTW= 2.17 cfs
Hudson POTW = 1.53 cfs
Total = 11.58 cfs*

The base flow of the Assabet River at the gage station is 12.67 cfs – 11.58 cfs* = 1.09 cfs/ base flow per square mile of drainage area

1.09 cfs/109 mi^2 = 0.1 cfs/mi^2

Estimated 7Q10 flow at Maynard POTW = Maynard gage 7Q10 + [(109 square miles – 109 square miles) x 0.1 cfs/sq. mile] = 12.667 cfs

12.67 cfs + (0) = 12.67 cfs

*This is the sum of the average monthly effluent flow from the three WWTPs upstream of the Maynard gage for July 2016. July 2016 was the month with the lowest streamflow over the past 5 years.

The dilution factor (DF) at the 7Q10 flow of 12.67 MGD in the receiving water upstream of the discharge, Q_s, and the Facility's design flow of 1.45 MGD, Q_d, was calculated as shown below:

Dilution Factor = (river flow at 7Q10 flow + design flow of the treatment plant)/design flow of the treatment plant.

$$DF = (Q_s + Q_d)/Q_d = 8.18 \text{ MGD} + 1.45 \text{ MGD})/1.45 \text{ MGD} = 6.64$$

5 Proposed Effluent Limitations and Conditions

The proposed limitations and conditions, the bases of which are discussed throughout this Fact Sheet, may be found in Part I of the Draft Permit. EPA determined the pollutants of concern based on EPA's technology based effluent requirements, pollutants believed present in the permit application, and other information.

5.1 Effluent Limitations and Monitoring Requirements

In addition to the State and Federal regulations described in Section 2, data submitted by the permittee in their permit application as well as in monthly discharge monitoring reports (DMRs) and in WET test reports from October 2012 to October 2017 were used to identify the pollutants of concern and to evaluate the discharge during the effluent limitations development process (*See* **Appendices A and B)**.

5.1.1 Wastewater Effluent Flow

The effluent flow limit in the 2005 Permit is 1.45 MGD, based on the Facility's design flow and is reported as a rolling annual average. A review of DMR data in Appendix A, from October 2012 through October 2017 show that the reported monthly flows have been in compliance with the 1.45 MGD flow limit. The annual average flow was 0.89 MGD with a range of 0.81 to 1.07 MGD.

The 1.45 MGD flow limit is carried forward in the Draft Permit as the Facility's design flow has not changed. The Draft Permit requires that flow be measured continuously and that the rolling annual average flow, as well as the average monthly and maximum daily flow for each month be reported on the monthly DMRs. The rolling annual average flow is calculated as the average of the flow for the reporting month and 11 previous months.

5.1.2 Biochemical Oxygen Demand (BOD_5)

5.1.2.1 BOD_5 Concentration Limits

The BOD_5 limits in the 2005 Permit are based on secondary treatment standards in 40 C.F.R. § 133.102. The average monthly limit is 30 mg/L and the average weekly limit is 45 mg/L.

A review of DMR data submitted from October 2012 through October 2017 shows that there have been no permit violations of the BOD_5 concentration limits. Based on the DMR data in Appendix A, the monthly average BOD_5 values averaged 3.91 mg/L (range 0-10 mg/L) and the reported monthly high weekly average[5] BOD_5 values averaged 5.94 mg/L (range 1-13 mg/L).

The Draft Permit proposes the same BOD_5 concentration limits as in the 2005 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains twice per week.

5.1.2.2 BOD_5 Mass Limits

The mass based BOD_5 limits in the 2005 Permit of 363 lb/day (monthly average) and 544 lb/day (weekly

[5] The "weekly average" reported on the monthly DMRs is the highest of the weekly averages for that month.

average) were based on establishing limitations, standards, and other permit conditions in 40 C.F.R. § 122.45.

A review of DMR data submitted from October 2012 through October 2017 shows that there have been no permit violations of BOD_5 mass limits. Based on the DMR data in Appendix A, the monthly average BOD_5 averaged 29.41 lb/day (range 3-78 lb/day) and the monthly high weekly average BOD_5 values averaged 45.78 lb/day (range 14-103 lb/day).

In the derivation of limits for the Draft Permit, the BOD_5 mass limits are based on Facility's design flow, as shown below.

BOD Mass Loading Calculations:

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

$$L = C_d * Q_d * 8.34$$

Where:

L = Maximum allowable load in lb/day.
C_d = Maximum allowable effluent concentration for reporting period in mg/L (reporting periods are average monthly and average weekly).
Q_d = Annual average design flow of Facility (1.45 MGD).
8.34 = Factor to convert effluent concentration in mg/L and design flow in MGD to lb/day.

Draft Permit Limits:

Monthly Average: 30 mg/L *1.45 MGD * 8.34 = 363 lb/day
Weekly Average: 45 mg/L* 1.45 MGD * 8.34 = 544 lb/day

The Draft Permit proposes the same BOD_5 mass based limits as in the 2005 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains twice per week.

5.1.3 Total Suspended Solids (TSS)

5.1.3.1 TSS Concentration Limits

The TSS limits in the 2005 Permit are based on secondary treatment standards in 40 C.F.R. § 133.102. The average monthly limit is 30 mg/L and the average weekly limit is 45 mg/L.

A review of DMR data submitted from October 2012 through October 2017 show that there have been no permit violations of TSS concentration limits. Based on the DMR data in Appendix A, the monthly average TSS values averaged 5.22 mg/L (range 0-13.6 mg/L) and the monthly high weekly average[6] TSS values averaged 7.37 mg/L (range 0-18 mg/L).

The Draft Permit proposes the same TSS concentration limits as in the 2005 Permit as no new WLAs

[6] The "weekly average" reported on the monthly DMRs is the highest of the weekly averages for that month.

have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains twice per week.

5.1.3.2 TSS Mass Limits

The mass based TSS limits in the 2005 Permit of 363 lb/day (monthly average) and 544 lb/day (weekly average) were based on establishing limitations, standards and other permit conditions in 40 C.F.R. § 122.45.

A review of DMR data submitted from October 2012 through October 2017 shows that there have been no permit violations of TSS mass limits. Based on the DMR data (*See* Appendix A), the monthly average TSS averaged 38.69 lb/day (range 0-119 lb/day) and the monthly high weekly average TSS values averaged 60.99 lb/day (range 0-201 lb/day).

In the derivation of limits for the Draft Permit, the TSS mass limits are based on Facility's design flow, as shown below.

TSS Mass Loading Calculations:

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

$$L = C_d * Q_d * 8.34$$

Where:

L = Maximum allowable load in lb/day.
C_d = Maximum allowable effluent concentration for reporting period in mg/L (reporting periods are average monthly and average weekly).
Q_d = Annual average design flow of Facility (1.45 MGD).
8.34 = Factor to convert effluent concentration in mg/L and design flow in MGD to lb/day.

Limits:

Monthly Average: 30 mg/L *1.45 MGD * 8.34 = 363 lb/day
Weekly Average: 45 mg/L* 1.45 MGD * 8.34 = 544 lb/day

The Draft Permit proposes the same TSS mass limits as in the 2005 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains twice per week.

5.1.4 Eighty-Five Percent (85%) BOD_5 and TSS Removal Requirement

In accordance with the provisions of 40 C.F.R. § 133.102(a)(3), (4) and (b)(3), the 2005 Permit requires that the 30-day average percent removal for BOD_5 and TSS be not less than 85%. A review of DMR data from October 2012 through October 2017 shows that BOD_5 and TSS removal percentages averaged 98% and 97%, respectively. There were no violations of the 85% removal requirement for BOD_5 or TSS during that period.

The requirements to achieve 85% BOD_5 and TSS removal have been carried forward into the Draft Permit.

5.1.5 pH

Consistent with the requirements of Massachusetts WQS at 314 CMR 4.05(3)(b)(3), the 2005 Permit requires that the pH of the effluent is not less than 6.5 or greater than 8.3 standard units at any time. The monitoring frequency in the 2005 Permit is three per day. A review of DMR data submitted from October 2012 through October 2017 show one violation of the minimum pH limitation of 6.5 that was reported as 6.03 in October 2016, pH values ranged from 6.03-8.25 standard units.

The pH requirements in the 2005 Permit are carried forward into the Draft Permit as there has been no change in the WQS with regards to pH. The Town has not reported a pH violation in the last 12 months and therefore EPA has reduced the monitoring frequency in the Draft Permit to twice per day.

5.1.6 Bacteria

The 2005 Permit includes effluent limitations for bacteria using fecal coliform bacteria as the indicator to protect recreational uses in the receiving water. A review of DMR data from October 2012 through October 2017 shows that the permittee has been in compliance with the average monthly fecal coliform limit of the 2005 Permit (200 cfu/100 mL) and reported exceedances of the maximum daily fecal coliform limit (400 cfu/100 mL) in 15 out of 60 months. The monthly geometric mean fecal coliform bacteria count ranged from 1 to 48 cfu/100 ml and the maximum fecal coliform count reported was 6300 cfu/100 mL

Consistent with Massachusetts' new bacteria criteria, which were approved by EPA on September 19, 2007, the bacteria limits proposed in the Draft Permit for Outfall 001 are 126 colony forming units (cfu) of *E.coli* per 100 milliliters (mL) as a geometric mean and 409 cfu of *E.coli* per 100 mL maximum daily value (this is the 90% distribution of the geometric mean of 126 cfu/100 mL[7]). The proposed monitoring frequency is three times per week, which is the same as the monitoring frequency for bacteria in the 2005 Permit. As in the 2005 Permit, the bacteria limits apply year-round. Due to the change in the Massachusetts bacteria criteria, there are no effluent limit or monitoring requirements for fecal coliform in the Draft Permit.

5.1.7 Total Residual Chlorine

The Permittee uses sodium hypochlorite to disinfect the final effluent. The 2005 Permit includes effluent limitations for total residual chlorine (TRC) of 79 ug/l (monthly average) and 140 ug/l (maximum daily). A review of DMR data from October 2012 through October 2017 shows that the permittee has been in compliance with the average monthly TRC limit (range 6-39 ug/L) and reported exceedances of the maximum daily TRC limit in 6 out of 60 months (range 7.6-645 ug/L).

The TRC permit limits are based on the instream chlorine criteria defined in *National Recommended Water Quality Criteria: 2002*, EPA 822R-02-047 (November 2002), as adopted by the MassDEP into the state water quality standards at 314 CMR 4.05(5)(e). The freshwater instream criteria for chlorine are 11 ug/l (chronic) and 19 ug/l (acute). Because the upstream chlorine is assumed to be zero in this case, the water quality-based chlorine limits are calculated using the criteria and the dilution factor, as follows:

Chronic criteria * dilution factor = Chronic limit

[7] MassDEP, "Draft 6/25/2007 Guidance on Implementation of Proposed Primary Contact Recreation Bacteria Criteria in Massachusetts Surface Water Quality Standards, 314 CMR 4.00," 2007, p.11, Table 2.

11 µg/L * 6.64 = 73.04 µg/L (average monthly)

Acute criteria * dilution factor = Acute limit

19 µg/L * 6.64 = 126.16 µg/L (maximum daily)

The Draft Permit has a monthly average TRC limit of 73 µg/L and a maximum daily TRC limit of 126 µg/L. The instream dilution is less than the dilution in the 2005 Permit consequently, The TRC effluent limits are more stringent in the Draft Permit.

5.1.8 Dissolved Oxygen

The 2005 Permit includes a seasonal dissolved oxygen minimum limit of 5.0 mg/L from April 1st to October 31st. This requirement was established to assure that dissolved oxygen levels remain above the state water quality standard of 5.0 mg/L particularly during low flow periods.

Review of the weekly monitoring data in the DMRs, provided in Appendix A, show an average DO of 9.16 mg/L (range 7.8-13.3 mg/L) from October 2012 through October 2017. The Draft Permit proposes a dissolved oxygen limit of 5.0 mg/L.

5.1.9 Ammonia

In addition to being a nutrient as a component of total nitrogen, nitrogen in the form of ammonia can reduce the receiving stream's dissolved oxygen concentration through nitrification and can be toxic to aquatic life, particularly at elevated temperatures. he toxicity level of ammonia depends on the temperature and pH of the receiving water (USEPA 1999).

Summer Ammonia Limits

The 2005 Permit includes a warm weather (June 1 through October 31) seasonal ammonia limit that was established to address the need to reduce the oxygen demanding component of the nitrogen cycle and reflect a need to reduce ammonia toxicity. As such, the 2005 Permit includes a monthly average limit of 12 mg/L. According to the 2005 Fact Sheet, the monthly average limit was carried forward from the 2000 Permit stating the basis for the limit was a dissolved oxygen model completed in 1986 by MassDEP. Review of the DMR monitoring October 2012 to October 2017, provided in Appendix A, shows that in the summer the monthly average ammonia in the effluent averaged 2.37 mg/L (range 0.62 to 5.75 mg/L).

The applicable chronic water quality criterion is dependent on the pH and temperature of the Assabet River. The applicable acute water quality criterion is dependent on the pH of the Assabet River only. The criteria can be derived using EPA-recommended ammonia criteria from the document: *Update of Ammonia Water Quality Criteria for Ammonia,* 1999 (EPA 822-R-99-014). These are the freshwater ammonia criteria in EPA's *National Recommended Water Quality Criteria,* 2002 (EPA 822-R-02-047) document, which are included by reference in the Massachusetts WQS (*See* 314 CMR 4.05(5)(e)). To determine the ammonia criteria, EPA reviewed pH and temperature monitoring data of the Assabet River upstream of the discharge. The instream pH and temperature data reviewed are from the monitoring program of the Organization for the Assabet, Sudbury & Concord River (OARS).

The acute criterion is 9.65 mg/L based on a pH of 7.7 standard units and the chronic criterion is 2.21 mg/L based on a pH of 7.7 standard units and an average river temperature of 22°C assuming salmonoids present. The presence of salmonids and early life stages of fish was a factor in determining the chronic

ammonia criterion based on information in the Sudbury, Assabet & Concord (SuAsCo) Watershed 2001 Water Quality Assessment published by MassDEP. Appendix B of the assessment report describes boat electroschocking on the Assabet River in Maynard resulting in capture of largemouth bass, brown bullhead, and bluegill fish. The SuAsCo Watershed 2001 Water Quality Assessment Report is available at http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/82wqar2.pdf.

EPA calculated a mass balance equation to determine if the monthly average ammonia-nitrogen limit of 12 mg/L in the 2005 Permit remains protective of the river downstream of the discharge. An ammonia-nitrogen concentration in the river, (C_r) is compared to the chronic criterion. OARS ambient ammonia data corresponding to the same dates as the pH and temperature data are all non-detect (<0.1 mg/L). Therefore, the ambient ammonia concentration used in the calculation is 0.

$$Q_rC_r = Q_dC_d + Q_sC_s$$

rewritten as:

$$C_r = \frac{Q_dC_d + Q_sC_s}{Q_r}$$

where:

Q_d = effluent flow (design flow = 1.45 MGD = 2.24 cfs)
C_d = effluent ammonia concentration in mg/L, 12 mg/L
Q_s = low flow upstream (12.67 cfs)
C_s = background in-stream ammonia concentration (0)
Q_r = downstream in-stream flow, downstream of the discharge ($Q_s + Q_d$ = 14.91 cfs)
C_r= ammonia-nitrogen downstream of the discharge during the low flow period

$$C_r = \frac{((2.24 \text{ cfs})(12 \text{ mg/L}) + (0))}{14.91 \text{ cfs}}$$

(26.88 +0)/14.91 = 1.8 mg/L

The ammonia-nitrogen concentration downstream of the discharge is less than the chronic criterion and therefore the existing monthly average limit of 12 mg/L is protective of the receiving water and is continued in the Draft Permit. The monitoring period from June 1 through October 31 and the sampling frequency of 2 times per week is carried forward from the 2005 Permit to the Draft Permit.

EPA conducted a reasonable potential analysis to establish the need for maximum daily ammonia-nitrogen limits during the warm weather season. EPA calculated a 99th percentile of the ammonia-nitrogen effluent data from the monthly DMRs. A maximum daily limit is required if the calculated in-stream concentration is greater than the recommended acute water quality criterion (9.65 mg/L).

Reasonable potential is determined by comparing the calculated in-stream concentration downstream of the discharge with the acute criterion. EPA's *Technical Support Document for Water Quality Based Toxics Control* (EPA/5-5/2-90-001, March 1991), commonly known as the "TSD," describes the statistical approach in determining if there is reasonable potential for an excursion greater than the maximum allowable concentration. If there is reasonable potential (for either acute or chronic conditions), the appropriate effluent limit is then calculated by rearranging the above mass balance to solve for the effluent

concentration (Cd) using the criterion as the resultant in-stream concentration (Cr).

$Q_dC_d + Q_sC_s = Q_rC_r$

$$C_r = \frac{(Q_dC_d + Q_sC_s)}{Q_r}$$

Where:

Q_d = effluent flow (design flow = 1.45 MGD = 2.24 cfs)
C_d = effluent ammonia nitrogen in mg/L, (9.25 mg/L is the 99th percentile)
Q_s = upstream 7Q10 low flow (12.67 cfs)
C_s = median upstream ammonia nitrogen concentration (0)
Q_r = streamflow downstream, after discharge ($Q_d + Q_s$ = 14.91 cfs)
C_r = downstream pollutant concentration in mg/L
C_r = 1.39 mg/L < 9.65 mg/L, the acute criterion

Since there is no reasonable potential of the ammonia-nitrogen concentration to cause or contribute to an exceedance of the acute ammonia water quality criterion during the warm weather, a daily maximum limit is not required.

Winter Ammonia Limits

The 2005 Permit includes monthly average and weekly average (November 1 through May 31) reporting requirements for ammonia-nitrogen. EPA did a reasonable potential analysis to establish the need for monthly average and maximum daily ammonia-nitrogen limits during the cold weather season.

A review of the monitoring data in the DMRs from October 2012 to October 2017 are provided in Appendix A for the cold weather season. The data show the monthly average ammonia-nitrogen concentration in the effluent averaged 2.78 mg/L (range 0.58 to 6.93 mg/L) and the monthly high weekly average[8] ammonia averaged 3.56 mg/L (range 0.79 to 8.9 mg/L).

During the cold weather months, a pH of 7.2 standard units and temperature of 6.8° C were used to determine the ammonia water quality criteria. The Assabet River pH and temperature data used to determine the criteria are from the OARS monitoring program. The recommended chronic criterion for ammonia is 5.39 mg/L for early life stages of fish present and the recommended acute criterion for ammonia at a pH of 7.2 standard units is 19.7 mg/L for salmonoids present.

Since the 2005 Permit does not have effluent limits based on the chronic criterion for the cold weather season EPA did a reasonable potential analysis using DMR data.

Monthly Average Ammonia-Nitrogen Limit
EPA used the mass balance equation below to determine if there is reasonable potential to cause or contribute to an exceedance greater than the in-stream water quality criteria for ammonia nitrogen.

$$Q_dC_d + Q_sC_s = Q_rC_r$$

[8] The "weekly average" reported on the monthly DMRs is the highest of the weekly averages for that month.

Solving for the downstream pollutant concentration, C_r,

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

Where:

Q_d = effluent flow (design flow = 1.45 MGD = 2.24 cfs)
C_d = effluent ammonia nitrogen in mg/L (6.11 mg/L; 95th percentile of winter monthly averages, *See* Appendix D)
Q_s = upstream 7Q10 low flow (12.67 cfs)
C_s = median upstream cold weather ammonia nitrogen concentration (0)
Q_r = streamflow downstream, after discharge ($Q_d + Q^s$ = 14.91 cfs)
C_r = downstream pollutant concentration in mg/L

C_r equals 0.92 mg/L, which is less than the chronic ammonia criteria of 5.39 mg/L so there is no reasonable potential for ammonia to cause or contribute to a violation of the acute ammonia criteria in the wintertime and a winter monthly average ammonia limit is not required.

Maximum Daily Ammonia-Nitrogen Limit

To determine whether the effluent has the reasonable potential to cause or contribute to an exceedance above the in-stream water quality criteria for ammonia nitrogen, the following mass-balance is used to project the in-stream concentration downstream from the discharge.

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

Solving for the downstream pollutant concentration, C_r,

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

Where:

Q_d = effluent flow (design flow = 1.45 MGD = 2.24 cfs)
C_d = effluent ammonia nitrogen in mg/L (9.12 mg/L; 99th percentile of winter monthly averages, *See* Appendix D)
Q_s = upstream 7Q10 low flow (12.67 cfs)
C_s = median upstream cold weather ammonia nitrogen concentration (0)
Q_r = streamflow downstream, after discharge ($Q_d + Q^s$ = 14.91 cfs)
C_r = downstream pollutant concentration in mg/L

C_r equals 1.37 mg/L, which is less than the acute ammonia criteria of 19.7 mg/L so there is no reasonable potential for ammonia to cause or contribute to a violation of the acute ammonia criteria in the wintertime and a daily maximum ammonia limit is not required.

5.1.10 Nutrients

Nutrients are compounds containing nitrogen and phosphorus. Although nitrogen and phosphorus are essential for plant growth, high concentrations of these nutrients can cause eutrophication, a condition in which aquatic plant and algal growth is excessive. Plant and algae respiration and decomposition reduces dissolved oxygen in the water, creating poor habitat for fish and other aquatic animals. Recent studies provide evidence that both phosphorus and nitrogen can play a role in the eutrophication of certain ecosystems. However, typically phosphorus is the limiting nutrient triggering eutrophication in fresh water ecosystems and nitrogen in marine or estuarine ecosystems. As discussed below, since there may be eutrophication effects in the Merrimack River Estuary, both phosphorus and nitrogen are nutrients of

concern.

Total Nitrogen

The Assabet River is tributary to the Merrimack River, which has a large and densely populated watershed including 40 POTW discharges in Massachusetts and New Hampshire. EPA estimates that approximately 15,000 lb/day of nitrogen is discharged by POTWs into the fresh water portion of the watershed and another 2,000 lb/day into the marine portion. Recent nitrogen data collected by CDM Smith in 2014 and 2016 in the estuarine portions of the Merrimack River indicates elevated total nitrogen and chlorophyll 'a' levels. In samples with salinity greater than 10 ppt, total nitrogen ranged from 0.442 to 1.67 mg/L while chlorophyll "a" ranged from 4 to 42 ppt[9]. EPA collected samples on the outgoing tide in 2017 in this area and found total nitrogen levels in the range of 0.62 mg/L to 1.3 mg/L and chlorophyll 'a' ranging from 2 to 8 ppt in samples with salinity greater than 10 ppt. Appendix E provides a summary of the data collected by EPA and CDM Smith. EPA is concerned about the impacts that these nitrogen levels may be having on aquatic life in the estuary as most of these results are outside the range typically found in healthy estuaries in Massachusetts.[10] However, more data is necessary to determine whether there is reasonable potential for nitrogen discharges from the facility to cause or contribute to a violation of the Massachusetts narrative nutrient criteria in the Merrimack River estuary, particularly data that characterizes aquatic life designated uses that may be affected in this area so that the narrative criteria can be interpreted numerically. In the meantime, EPA finds that quantifying the load of total nitrogen from this facility and others in the Merrimack River watershed is an important first step to understanding the loading of nitrogen from point sources and their potential impact on the estuary.

The Draft Permit includes a year-round quarterly monitoring and reporting requirement for total nitrogen which is the sum of nitrate, nitrite and total Kjeldahl nitrogen.

5.1.10.1 Phosphorus

The Massachusetts Integrated List of Waters, prepared to satisfy Sections 303(d) and 305(b) of the Clean Water Act, lists the Assabet River as not achieving water quality standards for several nutrient-related pollutants, including dissolved oxygen, aquatic macroinvertebrate bioassessments, aquatic plants (Macrophytes), excess algal growth, fish bioassessments, and phosphorus (Total). In addition to receiving wastewater flow from four publicly owned treatment facilities located in Westborough, Marlborough, Hudson, and Maynard, the Assabet River also has multiple dams, which compound nutrient-related water quality violations by creating sinks of phosphorus that accumulate in the sediments. A significant amount of this phosphorus in the sediments recycles into the water column during the critical growing period.

The 2005 Permit has a monthly average limit of 0.1 mg/L from May 1 to October 31 reported as a 60-day rolling average and a monthly average limit of 1.0 mg/L from November 1 to March 31 reported as a monthly average. The 2005 Permit also has a monthly average limit of 0.1 mg/L, reported as a median and a maximum daily limit of 0.2 mg/L reported as a maximum daily in the month of April. The effluent

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[9] CDM Smith/US Army Corps of Engineers New England District, *Merrimack River Watershed Assessment Study - Phase III Final Monitoring Data Report August 2017*, Appendix C.

[10]Howes, Brian, et al, Site-Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators Interim Report, Massachusetts Estuaries Project, December 22, 2003.

limits in the 2005 Permit are based on a TMDL[11] waste load allocation approved by EPA in 2004. The 2005 Permit also includes a monitoring and reporting requirement for ortho-phosphorus from November through March.

The monthly average phosphorus values averaged 0.08 mg/L (range 0.04 to 0.2 mg/L) in the warm weather months from 2012 to 2017 and 0.51 mg/L (range 0.17 to 0.87 mg/L) in the cold months for the same time period. The monthly average phosphorus values reported for the warm weather months were calculated as a 60-day rolling average whereas the monthly average phosphorus values reported for the cold weather months were calculated as a monthly average. The phosphorus monitoring data from the DMRs is provided in Appendix A.

In addition to waste load allocations for the four publicly owned treatment works, the TMDL also required a 90% reduction in the phosphorus loading from the sediments in the impoundments referred to as sediment flux reduction. The TMDL anticipated that if the necessary sediment flux reductions were not achieved, the growing season phosphorus limitations for the four POTW discharges would need to be further reduced. For example, if only a 75% reduction in phosphorus loading was achieved, the POTW phosphorus limitations would need to be reduced to at least 0.025 mg/L (TMDL page 29).

Following approval of the 2004 TMDL, a study was conducted by the Army Corps of Engineers (COE)[12] to consider methods for achieving the necessary sediment reductions, including dredging and dam removal. The study concluded that dam removal was the best alternative for addressing the ongoing source of phosphorus from the sediments and to restore a healthy riverine aquatic community. EPA is not aware of any effort underway towards removing any dams or other means of reducing the total phosphorus sediment load.

The Army COE study concluded that the TMDL required point source reductions alone would achieve approximately a 60% reduction in phosphorus loadings from the sediments. Although not specifically part of the Army COE study, a phosphorus flux model developed for the study indicated that winter phosphorus loading may also have a significant effect on summer sediment flux rates. The flux model stated phosphorus discharged from the WWTFs during the winter had a very significant impact on the phosphorus flux the following summer. The flux model indicated that the high phosphorus in the water column would adsorb on to the sediment material during the winter months. During the simulation when WWTFs reduced the concentration of phosphorus discharged in the late spring, the river sediment had a high phosphorus content from the winter, and the sediment would release it back to the water column. Results of this study indicate that the high summer phosphorus flux is due to not only the algal settling and cycling through the sediment, but also high phosphorus in the sediment from the winter conditions.[13]

The last of the four Assabet River wastewater treatment facility upgrades to achieve the 0.1 mg/L phosphorus limit was completed in early 2012. US EPA Region 1 conducted water quality sampling of the Assabet River during summer low flow conditions in 2012 to determine changes in water quality as a

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[11] Massachusetts Department of Environmental Protection (MassDEP). 2004. *Assabet River Total Maximum Daily Load for Total Phosphorus.* Report Number: MA82B-01-2004-01 Control Number CN 201.0.

[12] Department of Army, New England District, U.S. Army Corps of Engineers 2010. Planning Assistance to States Program, Assabet River, Massachusetts Sediment and Dam Removal Feasibility Study

[13] CDM 2008. Assabet River Sediment and Dam Removal Study, Modeling Report, June 2008

result of the treatment facility upgrades.[14] The data indicate that the Assabet River is still severely impaired including, elevated concentrations of phosphorus with the highest concentrations occurring near the bottom, large quantities of plant biomass, and frequent occurrences of supersaturated dissolved oxygen levels with associated pH criteria violations.

The MassDEP also surveyed the river during the summer of 2012 to determine the extent of Duckweed growth in the impoundments. The survey confirmed levels of Duckweed in the Assabet River impoundments remain excessive. Consequently, the receiving water continues to exceed water quality standards.

The sediment phosphorus flux has not been reduced, as required in the 2004 Total Phosphorous TMDL and since the winter phosphorus loading may also have a significant effect on summer sediment flux rates and eutrophication, the Draft Permit includes an average monthly total phosphorus limit of 0.1 mg/L for April through October. The averaging period has been changed from reporting a median in April and 60 day rolling average from May through October to reporting an average monthly from April through October. This is consistent with 40 C.F.R.§ 122.45(d)(2) which requires that limitations for POTWs be established as average weekly and average monthly limitations unless impracticable. An average monthly total phosphorus limit of 0.2 mg/L for November through March is included in the Draft Permit. This is consistent with the technology based Highest and Best Practical Treatment requirement in the MA SWQS at 314 CMR 4.05(c)[15].

The monitoring and reporting ortho-phosphorus requirement is no longer a requirement in the Draft Permit. EPA's intention in requiring winter ortho-phosphorus monitoring was to verify the assumption that the vast majority of the phosphorus discharges would be in the dissolved phase. It was EPA's determination at the time that the non-particulate ortho-phosphorus would pass through the river system and not accumulate in the sediments. However, since the last permit was issued, a 2008 study of the total phosphorus in sediments in the Assabet River indicated that winter phosphorus loadings accumulate in the sediment. Given that both dissolved and particulate phosphorus contribute to water quality impairments, EPA has determined that total phosphorus is the appropriate focus and cannot find reason to continue monitoring ortho-phosphorus in the wintertime or add such monitoring in the summertime. Therefore, EPA has removed the ortho-phosphorus monitoring requirement that was in the 2005 permit.

5.1.11 Metals

Dissolved fractions of certain metals in water can be toxic to aquatic life. Therefore, there is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. For the development of the Draft Permit, analyses were completed to evaluate whether there is reasonable potential for effluent discharges to cause or contribute to exceedances of the water quality criteria for aluminum, cadmium, lead, nickel, and zinc and to evaluate whether the limits in the 2005 Permit for copper continue to be protective, given the updated upstream hydrologic and chemical characteristics of the receiving water described earlier in this Fact Sheet.

5.1.11.1 Applicable Metals Criteria

Metals may be present in both dissolved and particulate forms in the water column. However, extensive

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[14]Faber, Tom. 2013. Assabet River Water Quality Survey, July 10-13, 2012, Data Report. USEPA New England Regional Laboratory.

[15] 314 CMR 4.00: Massachusetts Surface Water Quality Standards

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, Chapter 3, Section 3.6 and Appendix J, EPA 2012 [EPA 823-B-12-002]. Also see https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter3.pdf). As a result, state water quality criteria for cadmium, lead, nickel and zinc are established in terms of dissolved metals. Massachusetts aluminum criteria are expressed as total aluminum.

However, many inorganic components of domestic wastewater, including metals, are in 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 C.F.R. § 122.45(c) require, with limited exceptions, that effluent limits for metals in NPDES permits be expressed as total recoverable metals.

For hardness dependent metals criteria, the estimated hardness of the Assabet River downstream of the treatment plant during critical low flow periods and design discharge flow was calculated based on median ambient and effluent hardness data as reported in the Facility's whole effluent toxicity tests conducted in the summer months of 2012 through 2017.

Table 1. Maynard WPCF and Assabet River Hardness Data

WET Test Date	Effluent Hardness, mg/L (as CaCO3)	Assabet River Hardness, mg/L (data collected upstream)
September 2017	130	110
June 2017	140	67
September 2016	120	130
June 2016	130	82
September 2015	140	130
June 2015	140	92
September 2014	120	97
June 2014	110	61
September 2013	120	85
June 2013	110	33
September 2012	130	91
June 2012	110	48
Median	**125**	**88**

The mass balance equation below was used to estimate the hardness of the receiving water Cr, downstream of the discharge location.

$$Cr = \frac{QdCd + QsCs}{Qr} = \frac{(2.24\ cfs)(125\ mg/L) + (12.67\ cfs)(88\ mg/L)}{(2.24\ cfs + 12.67\ cfs)} = 93.55\ mg/L$$

Where:

Qs = 7Q10 river stream flow upstream of plant = 12.67 cfs
Qd = Design discharge flow from plant = 1.45 MGD = 2.24 cfs
Qr = Combined stream flow (7Q10 + plant flow) = 14.91 cfs
Cs = Median upstream hardness concentration = 88 mg/L as CaCo3
Cd = Median Maynard WPCF hardness concentration = 125 mg/L as CaCo3
Cr = Receiving water hardness concentration

Table 2 summarizes the calculation of the acute and chronic total recoverable criteria for each metal using the estimated receiving water hardness of 93.6 mg/L. For metals with a hardness based water quality criteria, the water quality criteria were calculated using the equations in EPA's National Recommended Water Quality Criteria: 2002 which are incorporated into the MA WQS by reference.

Table 2. Total Recoverable Water Quality Criteria for Metals

Metal	Parameters				Total Recoverable Criteria	
	ma	ba	mc	bc	Acute Criteria (CMC) (µg/L)	Chronic Criteria (CCC) (µg/L)
Aluminum	—	—	—	—	750	87
Cadmium	1.0166	-3.9240	0.7409	-4.7190	1.99	0.26
Lead	1.273	-1.46	1.273	-4.705	75.02	2.92
Nickel	0.846	2.255	0.846	0.0584	443.53	49.31
Zinc	0.8473	0.884	0.8473	0.884	113.26	113.26

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

5.1.11.2 Reasonable Potential Analysis

A mass balance equation, (shown below) was used to determine whether or not the effluent has the reasonable potential to cause or contribute to an exceedance greater than the in-stream water quality criteria for each metal.

$$Q_dC_d + Q_sC_s = Q_rC_r$$

Solving for the receiving water metals concentration downstream of the discharge, C_r, yields;

$$C_r = \frac{Q_dC_d + Q_sC_s}{Q_r}$$

Where:

Q_d = effluent flow (design flow = 2.24 cfs
C_d = effluent metals concentration in µg/L (95th percentile)
Q_s = low flow upstream of the treatment plant's discharge (12.67 cfs)
C_s = background in-stream metals concentration in µg/L (median), Appendix B. River Metals

Data
Q_r = combined stream flow (7Q10 + plant flow = (2.24 + 12.67) = 14.91 cfs)

Reasonable potential is then determined by comparing the in-stream concentration, $C_{r,}$ (for both acute and chronic conditions) with the criteria 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. If there is reasonable potential (for either the acute or chronic conditions), the appropriate limit is calculated by rearranging the above mass balance equation to solve for the effluent concentration (C_d) using the acute or chronic criterion as the in-stream concentration (C_r). See Table 3 for the results of this analysis for aluminum, cadmium, lead, nickel and zinc.

Since the concentration of cadmium, lead, nickel and zinc do not indicate reasonable potential to cause or contribute to an exceedance of the applicable water quality criteria, limits for these metals are not proposed for the Draft Permit. Monitoring for all listed metals will continue to be required for part of the quarterly WET tests.

Table 3. Reasonable Potential Table

Metal	Q_d	Cd[1] 95th percentile	Q_s	Cs[2] (median)	Qr = Qs + Qd	Cr = (QdCd+QsCs) / Q_R	Criteria Total Recoverable		RP	Limit = (QrCr-QsCs) / Q_d	
	cfs	µg/L	cfs	µg/L	cfs	µg/L	Acute (µg/L)	Chronic (µg/L)	Cr > Criteria	Acute (µg/L)	Chronic (µg/L)
Aluminum	2.24	2108.41	12.67	54	14.91	362.58	750	87	Y	N/A	273.66
Cadmium		0		0		0	1.99	0.26	N	N/A	N/A
Lead		0.026		0.8		0.68	75.01	2.92	N	N/A	N/A
Nickel		3.36		2		2.20	443.53	49.31	N	N/A	N/A
Zinc		31.2		8		11.49	113.26	113.26	N	N/A	N/A

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1 Data from 2012-2017 Whole Effluent Toxicity (WET) testing were used to calculate values for cadmium, lead, nickel and zinc

.2 Median upstream ambient data taken from WET testing on the Assabet River upstream of the Maynard WPCF. (see Appendix B)

5.1.11.3 Aluminum

The 2005 permit has an average monthly reporting requirement for aluminum. Review of the monthly average monitoring data in the DMRs from October 2012 to October 2017, provided in Appendix A, shows an average of 480.3 µg/L (range 0 to 1400 µg/L). Since the aluminum criteria are not hardness dependent, the criteria have not changed.

Table 3, indicates that the instream aluminum concentration downstream of the discharge is greater than the water quality criteria (C_r >C) therefore, reasonable potential exists for the discharge to cause or contribute to an exceedance of applicable chronic water quality criteria. The Draft Permit proposes an average monthly aluminum effluent limit of 274 µg/L with monthly monitoring.

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

$$C_d=(14.91 \text{ cfs} * 87 \text{ µg/L}) - (12.67 \text{ cfs} * 54 \text{ µg/L})/(2.24 \text{ cfs}) = 273.66 \text{ µg/L}$$

Where

C_r =Concentration downstream of the outfall = 87 µg/L
Q_d =Discharge flow = 2.24 cfs
C_d =average monthly discharge concentration = x µg/L
Q_s =Upstream flow = 12.67 cfs
C_s =Median background concentration = 54 µg/L
Q_r =Streamflow below outfall = (7Q10 + Plant flow) = (12.67 +2.24) = 14.91 cfs

The final aluminum effluent limit is based on current Massachusetts, EPA approved, aluminum criteria to protect fresh water aquatic life. However, EPA is aware of ongoing efforts by MassDEP to soon revise the Massachusetts aluminum criteria based, at least in part, on forthcoming new EPA aluminum criteria recommendations which are expected to be finalized within the coming months.[16] MassDEP has informed EPA that it expects to propose the revisions to its aluminum criteria in 2018. For three years after the effective date of the permit, MassDEP will inform EPA at reasonable intervals of its progress on the development and promulgation of new aluminum criteria.

EPA's draft aluminum criteria recommendations indicate that the new aluminum criteria recommendations may be higher than the current recommendations. Because MassDEP has indicated to EPA that its planned revisions to its aluminum criteria will be based on EPA's recommended criteria, EPA reasonably expects its new criteria may also be higher. EPA has therefore determined that it is appropriate to include a schedule of compliance, pursuant to 40 C.F.R. § 122.47, in the Draft Permit which provides the permittee with a 3-year period to achieve compliance with the final aluminum effluent limit. Additionally, the permittee may apply for a permit modification to allow additional time for compliance if Massachusetts has adopted new aluminum criteria but has not yet submitted the criteria to EPA for review or EPA has not yet acted on the new criteria. If new aluminum criteria are adopted by Massachusetts and approved by EPA, and before the final aluminum effluent limit goes into effect, the permittee may apply for a permit modification to amend the permit based on the new criteria. If

[16] More information about EPA's work to develop new aluminum criteria recommendations is available at https://www.epa.gov/wqc/2017-draft-aquatic-life-criteria-aluminum-freshwater.

warranted by the new criteria and a reasonable potential analysis, EPA may relax or remove the effluent limit to the extent consistent with anti-degradation requirements. Such a relaxation or removal would not trigger anti-backsliding requirements as those requirements do not apply to effluent limits which have yet to take effect pursuant to a schedule of compliance. *See American Iron and Steel Institute v. EPA*, 115 F.3d 979, 993 n.6 (D.C. Cir. 1997) ("EPA interprets § 402 to allow later relaxation of [an effluent limit] so long as the limit has yet become effective.")

5.1.11.4 Cadmium

A review of cadmium data from the Facility's WET tests were all reported as non-detect (at or less than the minimum level) as shown in Appendix A of the Fact Sheet. Since all the available data are below the minimum level, and since data reported below the minimum level are unreliable, EPA determined that there is no reasonable potential to exceed the cadmium water quality criterion. As in the 2005 Permit, monitoring of cadmium will continue to be required as part of the annual WET tests. However, the permittee must monitor using an analytical method that achieves a minimum detection level of 0.2 µg/L. This is "sufficiently sensitive" to assure that the effluent does not exceed the applicable chronic criteria of 0.26 µg/L and an acute criterion of 1.99 µg/L.

5.1.11.5 Lead, Nickel and Zinc

Table 3, indicates that the instream concentration for lead, nickel and zinc downstream of the discharge are less than the water quality criteria therefore no reasonable potential exists for the discharge to cause or contribute to an exceedance of applicable chronic water quality criteria. The Draft Permit does not include effluent limits for any of these metals.

5.1.11.6 Copper

The 2005 permit has an average monthly copper effluent limit of 37 µg/L and a daily maximum copper effluent limit of 53 µg/L. The effluent limits were based on the chronic and acute water quality criteria recommended in the EPA 1998 National Recommended Water Quality Criteria for Copper. The water quality criteria were based on an assumed hardness of 50 mg/L reported as an equivalent concentration of Calcium Carbonate ($CaCO_3$) of the receiving water. As can be seen in Appendix A of the DMR summary, the average monthly copper concentration in the effluent from October 2012 through October 2017 ranged from 0 µg/L to 50 µg/L with an average of 7.39 µg/L. The maximum daily concentration ranged from 0.01 µg/L to 50 µg/L with an average of 9.57 µg/L. The one exceedance of the average monthly effluent limit of 50 µg/L was in February 2014 and there were no exceedances of the daily maximum effluent limit of 53 µg/L. Since February 2014, the Town has been in compliance with the average monthly and maximum daily copper effluent limits in the 2005 Permit.

In December 2006, the MA SWQS were revised to include site specific copper criteria that were adopted for several water bodies in the Massachusetts, including the entire Assabet River. MassDEP adopted a chronic dissolved criterion of 18.1 µg/L and an acute dissolved criterion of 25.7.

A median copper concentration of 3 µg/L upstream of the discharge shown in in Appendix B. Assabet River Metals Data. The analytical method used to measure the concentration in the WET tests had a minimum detection level of 2.0 µg/L. Therefore, non-detects were estimated as one-half of the minimum detection level or 1.0 µg/L.

Site Specific Criteria-Based Copper Limits

The effluent limits from the 2005 permit were re-evaluated, based on the new site-specific criteria, the upstream copper data reported in recent WET tests, and the updated receiving water 7Q10 low flow to determine whether the 2005 effluent limit would continue to prevent a violation of water quality standards. The following mass balance equation was used:

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

where,

Q_r = receiving water flow downstream of the discharge (7Q10 + plant flow), 14.91 cfs;
C_r = copper concentration in the receiving water downstream;
Q_d = design flow of the discharge, 2.24 cfs;
C_d = copper concentration in the discharge, in this case the the allowable effluent limits of 37 µg/L (monthly average) and 53 µg/L (daily maximum);
Q_s= receiving water flow upstream of the discharge, 12.67 cfs; and
C_s = copper concentration in the receiving water upstream of the discharge, 3.0 µg/L.

Substituting these values into the equation for the monthly average limit yields:

$$Cr = \frac{(2.24 \text{ cfs} * 37 \text{ µg/L}) + (12.67 \text{ cfr} * 3.0 \text{ µg/L})}{14.91 \text{ cfs}} = 8.1 \text{ µg/L}.$$

Since 8.1 µg/L is less than the chronic site-specific criteria of 18.1 µg/L, the monthly average effluent limit from the 2005 permit continues to be protective and has been carried forward into the Draft Permit.

Substituting the values into the equation for the daily maximum effluent limit yields:

$$Cr = \frac{(2.24 \text{ cfs} * 53 \text{ µg/L}) + (12.67 \text{ cfr} * 3.0 \text{ µg/L})}{14.91 \text{ cfs}} = 10.5 \text{ µg/L}.$$

Since 10.5 µg/L is less than the chronic site-specific criteria of 25.7 µg/L, the daily maximum effluent limit from the 2005 permit continues to be protective and has been carried forward into the Draft Permit.

5.2 Whole Effluent Toxicity

Sections 402(a)(2) and 308(a) of the CWA provide EPA and States with the authority to require toxicity testing. Section 308 specifically describes biological monitoring methods as techniques that may be used to carry out objectives of the CWA. Whole effluent toxicity (WET) testing is conducted to ensure that the additivity, antagonism, synergism and persistence of the pollutants in the discharge do not cause toxicity, even when the pollutants are present at low concentrations in the effluent. The inclusion of WET requirements in the Draft Permit will assure that the Facility does not discharge combinations of pollutants into the receiving water in amounts that would affect aquatic life or human health.

In addition, under § 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on WQSs. Under certain narrative State WQSs, and §§ 301, 303 and 402 of the CWA, EPA and the States may establish toxicity-based limitations to implement the narrative "no toxics in toxic amounts". The Massachusetts WQSs at 314 CMR 4.05(5)(e) state, "*All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife."*

National studies conducted by the EPA have demonstrated that domestic sources, as well as industrial sources, contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Some of these constituents may cause synergistic effects, even if they are present in low concentrations. Because of the source variability and contribution of toxic constituents in domestic and industrial sources, EPA assumes that there is a reasonable potential for this discharge to cause or contribute to an exceedance of the "no toxics in toxic amounts" narrative water quality standard.

Further, EPA Region 1 and MassDEP[17] current toxic policies require toxicity testing for all dischargers such as the Maynard WPCF. In accordance with these policies, whole effluent chronic effects are regulated by limiting the highest measured continuous concentration of an effluent that causes no observed chronic effect on a representative standard test organism, known as the chronic No Observed Effect Concentration (C-NOEC). Whole effluent acute effects are regulated by limiting the concentration that is lethal to 50% of the test organisms, known as the $LC_{50.}$ According to this policy dischargers having a dilution factor less than 10 are required to conduct acute and chronic toxicity testing four times per year for two species. Additionally, for discharges with dilution factors less than 10, the C-NOEC effluent limit should be greater than or equal to the receiving water concentration and the LC_{50} limit should be greater than or equal to 100%.

The chronic and acute WET limits in the 2005 Permit are C-NOEC greater than or equal to 14% and LC_{50} greater than or equal to 100%, respectively, using the daphnid, *Ceriodaphnia dubia (C. dubia)*, as the test species. The Facility has consistently met these limits, as can be seen from the DMR summary in Appendix A. EPA eliminated the required testing for the fathead minnow (*Pimephales promelas*) based on WET test results for *Ceriodaphnia dubia* in the 2005 Permit because the daphnid, *Ceriodaphnia dubia (C. dubia)*, was found to be the more sensitive species.

Based on the potential for toxicity from domestic and industrial contributions, the state narrative water quality criterion, the dilution factor of 6.64, and in accordance with EPA national and regional policy and 40 C.F.R. § 122.44(d), the Draft Permit includes a slight increase ($\geq$ 15%) of the NOEC effluent limit from the 2005 permit limit of greater than or equivalent to 14%. The calculated dilution factor is smaller in the Draft Permit than the dilution factor in the 2005 Permit. The testing organism and the testing frequency will remain the same in the Draft Permit as in the 2005 permit. WET testing must be performed in accordance with the updated EPA Region 1 test WET test procedures and protocols specified in Attachments A and B of the Draft Permit (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011 and USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013).

5.3 Sludge Conditions

Section 405(d) of the Clean Water Act requires that EPA develop technical standards regarding the use and disposal of sewage sludge. On February 19, 1993, EPA promulgated technical standards. These standards are required to be implemented through permits. The conditions in the permit satisfy this requirement.

5.4 Infiltration/Inflow (I/I)

Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes,

[17] Implementation Policy for the Control of Toxic Pollutants in Surface Waters, MassDEP 1990

or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity and the efficiency of the treatment works and may cause bypasses to secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSOs) in separate systems, and combined sewer overflows (CSOs) in combined systems.

The Draft Permit includes a requirement for the permittee to control infiltration and inflow (I/I) within the sewer collections system it owns and operates. The permittee shall develop an I/I removal program commensurate with the severity of I/I in the collection system. This program may be scaled down in sections of the collection system that have minimal I/I.

5.5 Operation and Maintenance of the Sewer System

The standard permit conditions for 'Proper Operation and Maintenance', found at 40 C.F.R. § 122.41(e), require the proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. The requirements at 40 C.F.R. § 122.41(d) impose a 'duty to mitigate' upon the permittee, which requires that "all reasonable steps be taken to minimize or prevent any discharge violation of the permit that has a reasonable likelihood of adversity affecting human health or the environment. EPA and MassDEP maintain that an I/I removal program is an integral component of ensuring permit compliance with the requirements of the permit under the provisions at 40 C.F.R. § 122.41(d) and (e).

General requirements for proper operation and maintenance, and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.C. and I.D. of the Draft Permit. These requirements include mapping of the wastewater collection system, preparing and implementing a collection system operation and maintenance plan, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to separate sewer collection systems (combined systems are not subject to I/I requirements) to the extent necessary to prevent SSOs and I/I related effluent violations at the Wastewater Treatment Facility and maintaining alternate power where necessary. These requirements are included 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 the Draft Permit are not included in the 2005 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 the collection system and has included schedules for completing these requirements in the Draft Permit.

5.6 Standard Conditions

The standard conditions of the permit are based on 40 C.F.R. §122, Subparts A, C, and D and 40 C.F.R. § 124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

6 Federal Permitting Requirements

6.1 Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA), grants authority and imposes

requirements on Federal agencies regarding endangered or threatened species of fish, wildlife, or plants (listed species) and habitat of such species that has been designated as critical (a "critical habitat").

Section 7(a)(2) of the ESA requires every Federal agency, in consultation with and with the assurance of the Secretary of Interior, to ensure that any action it authorizes, funds or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers § 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers § 7 consultations for freshwater species.

The Federal action being considered in this case is EPA's proposed NPDES permit for the Facility. The Draft Permit is intended to replace the 2005 Permit in governing the Facility. As the federal agency charged with authorizing the discharge from this Facility, EPA determines potential impacts to federally listed species, and initiates consultation, when required under § 7(a)(2) of the ESA.

EPA has reviewed the federal endangered or threatened species of fish and wildlife to determine if any listed species might potentially be impacted by the re-issuance of the NPDES permit. The review revealed that there are no known federally listed threatened or endangered species or their critical habitat within the vicinity of the Maynard WPCF discharge and, therefore, a formal EPA consultation will not be required for this discharge.

6.2 Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (*see* 16 U.S.C. § 1801 et seq., 1998), EPA is required to consult with the National Marine Fisheries Service (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat". *See* 16 U.S.C. § 1855(b).

The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". *See* 16 U.S.C. § 1802(10). "Adverse impact" means any impact that 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.
EFH is only designated for fish species for which federal Fisheries Management Plans exist. *See* 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 Assabet River is not covered by EFH designation for riverine systems and thus EPA has determined that a formal consultation with NMFS is not required.

7 Public Comments, Hearing Requests and Permit Appeals

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 Betsy Davis, U.S. EPA, Office of Ecosystem Protection, Municipal Permits Branch, 5 Post Office Square, Suite 100 (OEP06-1), Boston, Massachusetts 02109-3912 or via email to davis.betsy@epa.gov.

Any person, prior to the close of the public comment period, 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 meeting may be held if the criteria stated in 40 C.F.R. § 124.12 are satisfied. In reaching a final decision on the Draft Permit, the EPA 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 any public hearings, if such hearings are held, the EPA will issue a Final Permit decision, forward a copy of the final decision to the applicant, and provide a copy or notice of availability of the final decision to each person who has submitted written comments or requested notice. Within 30 days following the notice of the Final Permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. § 124.19 and/or submit a request for an adjudicatory hearing to MassDEP's Office of Appeals and Dispute Resolution consistent with 310 CMR 1.00.

8 EPA and MassDEP Contacts

The administrative record on which this Draft Permit is based may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

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5 Post Office Square, Suite-100 (OEP06-1)
Boston, MA 02109-3912
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Email: davis.betsy@epa.gov

Jennifer Wood
Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
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Boston, MA 02108
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Email: jennifer.wood@state.ma.us

October, 2018
Date

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

Figure 2: Location of the Maynard WPCF

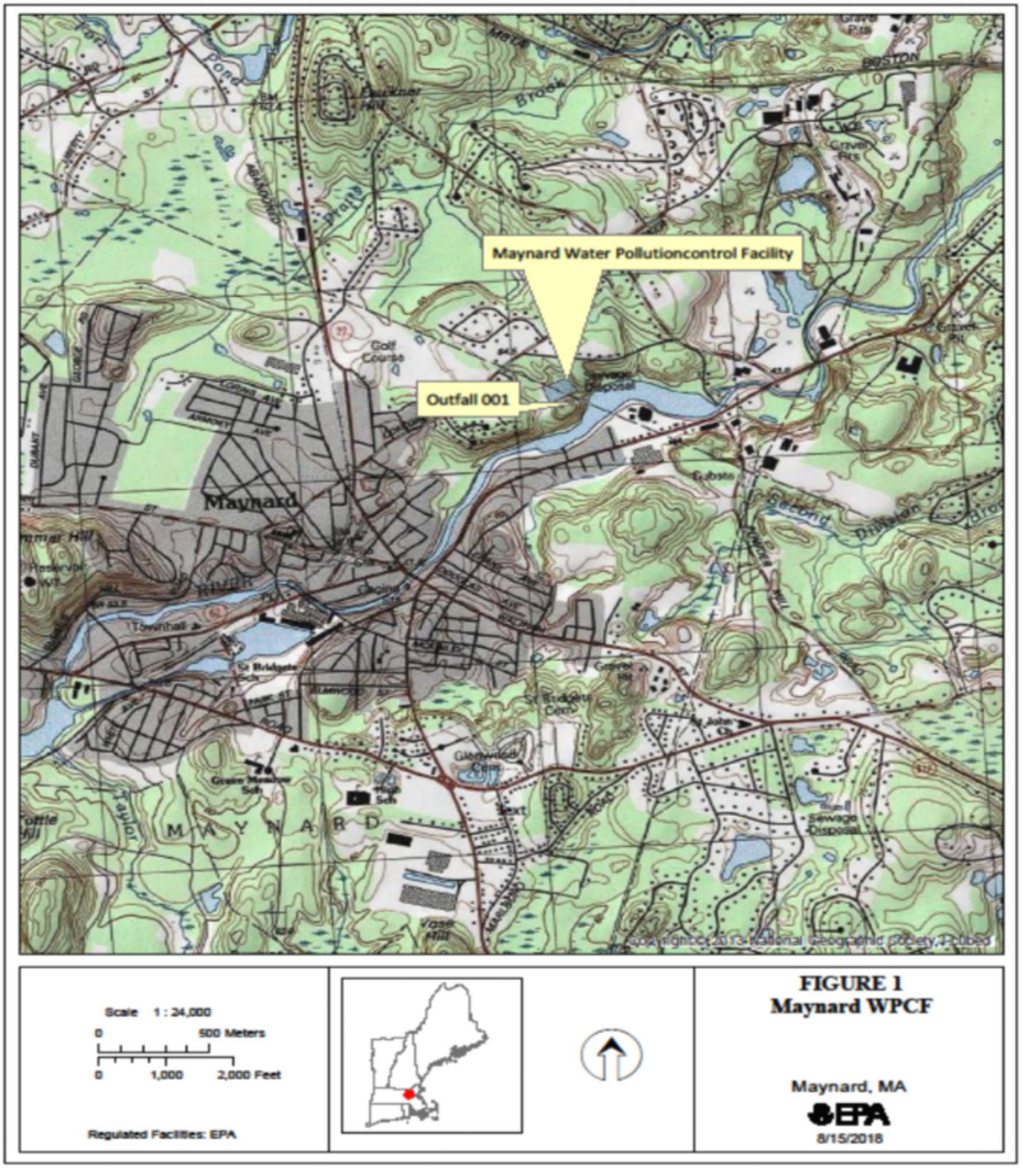
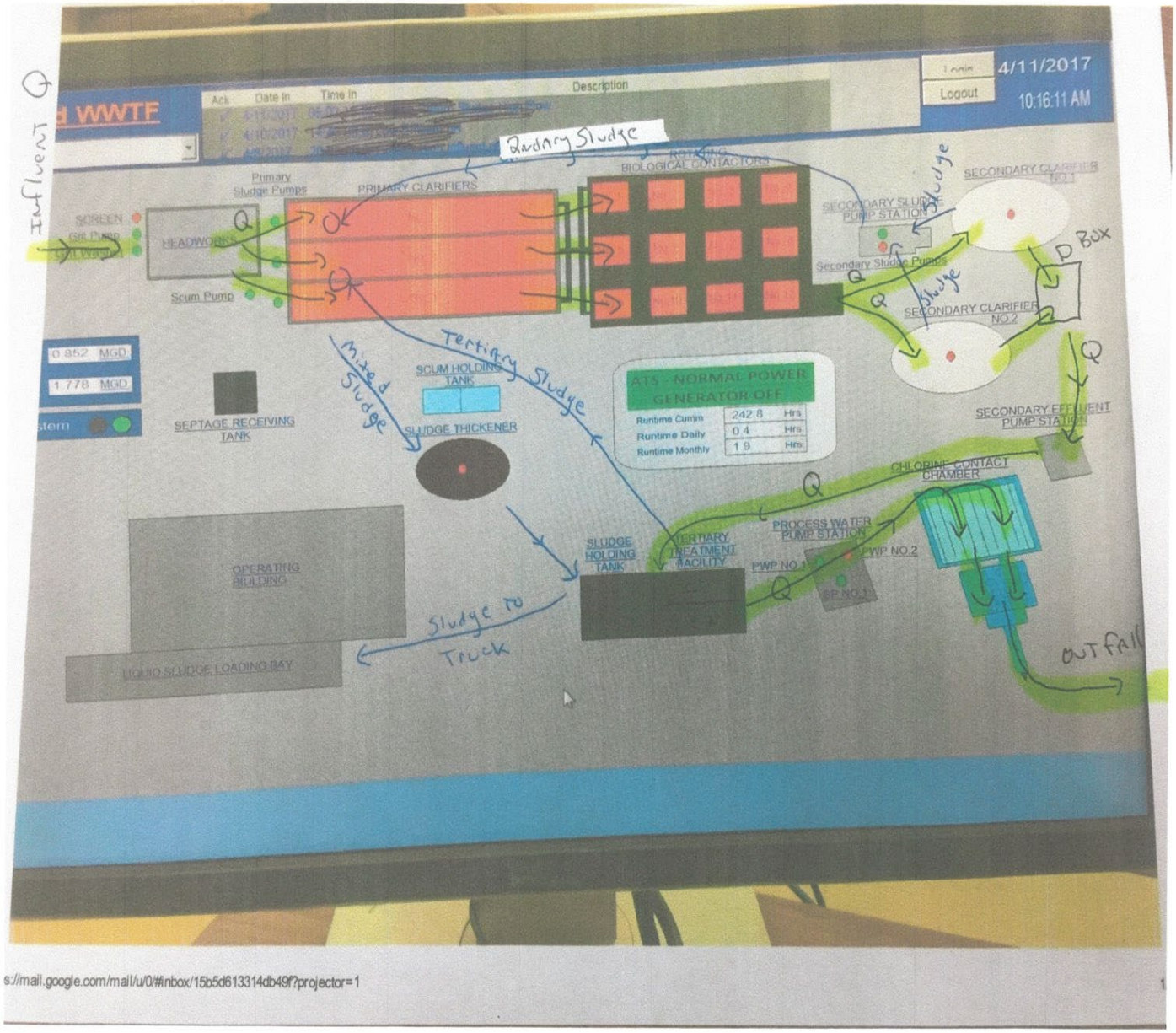


Figure 2: Maynard Water Pollution Control Facility Flow Process Diagram



Monitoring Period End Date	Flow 12 MO AVG MGD	BOD_5 MO AVG, mg/L	BOD_5 MO AVG, lbs/day	BOD_5 WKLY AVG, mg/L	BOD_5 WKLY AVG, lbs/day	BOD_5 DAILY MX, mg/L	BOD_5 % Removal
10/31/2012	0.96	3	20.3	5.3	35.5	7.6	99
11/30/2012	0.92	5.03	34.2	7.45	50.7	10	90
12/31/2012	0.883	4.7	32.3	7.9	65.6	8.9	97
1/31/2013	0.866	5.61	40.3	7.5	53.9	11	96
2/28/2013	0.854	5.56	40	8	57	11	98
3/31/2013	0.881	5.1	54.7	8	85.9	13	97
4/30/2013	0.887	2.06	17	2.25	18.95	2.5	99
5/31/2013	0.879	2.8	20	5.3	55	7.6	95
6/30/2013	0.909	3.53	36	8	85	14	91.7
7/31/2013	1.07	3.7	63	8	32	8.6	99
8/31/2013	1.04	2.6	20	3	17	3.1	99
9/30/2013	0.919	4.98	30	8	98	13	99
10/31/2013	0.912	4.14	25	5.75	72	7.9	99
11/30/2013	0.81	7	41	8	81	14	98
12/31/2013	0.866	4.41	28	3.9	39	9.1	99
1/31/2014	0.869	6.08	45	6.9	52	9.3	99
2/28/2014	0.868	3	21	4.5	35	6	98
3/31/2014	0.855	2.14	20	2.6	18	3	98
4/30/2014	0.885	2.3	17	3.2	34	3.4	97
5/31/2014	0.873	3.1	27	8.1	20	8.1	98
6/30/2014	0.899	3.85	29	5.7	43	9.4	98
7/31/2014	0.89	6	39	11	72	13	97
8/31/2014	0.9	6	36	8	56	10	98
9/30/2014	0.88	4	26	7	42	8	99
10/31/2014	0.88	6	36	8	47	12	97
11/30/2014	0.88	5	39	7	63	8	97
12/31/2014	0.92	7	69	8	103	11	96
1/31/2015	0.92	5	37	10	74	16	98
2/28/2015	0.92	4	26	6	35	6	98
3/31/2015	0.92	5	44	8	59	13	98
4/30/2015	0.92	4	44	6	77	9	97
5/31/2015	0.91	1	7	3	29	4	100
6/30/2015	0.9	3	24	7	57	9	99
7/31/2015	0.91	1	9	5	44	6	100
8/31/2015	0.91	1	6	3	15	5	100
9/30/2015	0.91	2	11	3	14	5	99
10/31/2015	0.91	2	12	5	34	6	99
11/30/2015	0.9	10	58	10	63	12	96
12/31/2015	0.86	7	49	8	48	12	97
1/31/2016	0.86	invalid test	invalid test	invalid test	invalid test	invalid test	95
2/28/2016	0.87	10	78	13	91	12	95

Monitoring Period End Date	Flow 12 MO AVG MGD	BOD_5 MO AVG, mg/L	BOD_5 MO AVG, lbs/day	BOD_5 WKLY AVG, mg/L	BOD_5 WKLY AVG, lbs/day	BOD_5 DAILY MX, mg/L	BOD_5 % Removal
3/31/2016	0.86	5	45	9	75	10	97
4/30/2016	0.83	3	30	4	38	4	98
5/31/2016	0.83	4	28	5	38	6	98
6/30/2016	0.82	3	23	5	35	5	98
7/31/2016	0.81	3	19	4	26	4	99
8/31/2016	0.81	3	18	6	31	8	99
9/30/2016	0.81	5	28	10	52	10	98
10/31/2016	0.81	5	33	6	43	7	98
11/30/2016	0.82	5	32	6	39	6	98
12/31/2016	0.82	4	26	5	33	6	98
1/31/2017	0.83	4	30	4	37	4	98
2/28/2017	0.84	3	26	4	29	4	98
3/31/2017	0.83	2	20	4	37	5	99
4/30/2017	0.87	0	3	4	33	2	100
5/31/2017	0.9	1	13	3	24	3	99
6/30/2017	0.93	1	12	1	15	3	99
7/31/2017	0.94	3	19	3	24	4	99
8/31/2017	0.96	2	14	3	19	3	99
9/30/2017	0.97	3	21	4	27	4	99
10/31/2017	0.97	2	14	3	20	3	99
2005 Permit Limit	**1.45 MGD**	**30 mg/L**	**363 lbs/day**	**45 mg/L**	**544 lbs/day**	**Report, mg/L**	**85%**
Minimum	0.81	0	3	1	14	2	90
Maximum	1.07	10	78	13	103	16	100
Average	0.89	3.91	29.41	5.94	45.78	7.64	98
# Measurements	61	60	60	60	60	60	61
Exceedances	0	0	0	0	0	N/A	0

Monitoring Period End Date	TSS MO AVG, mg/L	TSS MO AVG, lbs/day	TSS WKLY AVG, mg/L	TSS WKLY AVG, lbs/day	TSS DAILY MX, mg/L	TSS % Removal
10/31/2012	2.5	16.8	3.2	21.5	4	99
11/30/2012	11.9	81.2	15.5	105.5	18	92
12/31/2012	13.6	93.8	14.5	101.6	19	91
1/31/2013	11.06	79	14	101	15	94
2/28/2013	7.71	55	10.9	77	13	96
3/31/2013	6.91	75	8.5	91.9	10	95
4/30/2013	2.65	22	3.85	32	5.7	98
5/31/2013	2.58	19	4.65	62	7.3	96
6/30/2013	2.41	26	3	32	4	98
7/31/2013	2.23	16	2.5	18	3	99
8/31/2013	2.66	17	2	20	3	99
9/30/2013	2.55	16	3	198	3.33	99
10/31/2013	3.6	22	4.2	81	6	98
11/30/2013	11	64	14	90	18	97
12/31/2013	12	77	13	90	14	96
1/31/2014	12	90	14	106	16	96
2/28/2014	5.3	36	4.5	46	14	97
3/31/2014	2.5	23	3	21	4	98
4/30/2014	3	34	3.5	56	4.7	97
5/31/2014	2.14	19	2	19	2.7	98
6/30/2014	3.13	23	4.85	43	7.7	98
7/31/2014	8	46	12	79	22	95
8/31/2014	3	16	12	66	5	99
9/30/2014	2	12	3	16	3	99
10/31/2014	4	25	5	35	8	98
11/30/2014	12	88	18	136	21	94
12/31/2014	12	119	15	180	15	90
1/31/2015	9	71	12	88	16	96
2/28/2015	9	55	11	70	11	95
3/31/2015	6	58	9	70	10	96
4/30/2015	7	88	16	201	16	92
5/31/2015	3	24	5	34	9	98
6/30/2015	5	38	8	68	10	98
7/31/2015	2	17	3	21	5	99
8/31/2015	3	17	4	24	6	99
9/30/2015	2	15	5	32	7	99
10/31/2015	2	10	3	22	7	99
11/30/2015	11	66	13	74	14	95
12/31/2015	12	77	14	88	15	95
1/31/2016	9	68	12	93	12	96
2/28/2016	13	101	15	129	15	93

Monitoring Period End Date	TSS MO AVG, mg/L	TSS MO AVG, lbs/day	TSS WKLY AVG, mg/L	TSS WKLY AVG, lbs/day	TSS DAILY MX, mg/L	TSS % Removal
3/31/2016	7	63	13	106	13	96
4/30/2016	0	3	1	11	2	100
5/31/2016	1	6	2	14	4	100
6/30/2016	1	6	3	21	4	100
7/31/2016	1	7	4	22	5	100
8/31/2016	2	12	4	22	8	99
9/30/2016	7	36	16	84	16	98
10/31/2016	6	40	10	71	13	98
11/30/2016	10	59	13	74	15	97
12/31/2016	7	42	8	49		98
1/31/2017	5	45	6	53	6	98
2/28/2017	6	53	7	66	10	97
3/31/2017	4	37	8	81	10	98
4/30/2017	1	11	3	43	5	100
5/31/2017	0	0	0	0	0	100
6/30/2017	0	0	0	0	0	100
7/31/2017	0	2	1	11	3	100
8/31/2017	1	6	3	27	7	100
9/30/2017	1	10	2	16	4	99
10/31/2017	1	6	2	11	4	100
2005 Permit Limit	**30**	**363**	**45**	**544**	**Report**	**85%**
Minimum	0	0	0	0	0	90
Maximum	13.6	119	18	201	22	100
Average	5.22	38.69	7.37	60.99	9.14	97
# Measurements	61	61	61	61	60	61
Exceedances	0	0	0	0	N/A	0

Monitoring Period End Date	pH MIN	pH MAX	Fecal Coliform MO GEO MN	Fecal Coliform DAILY MX	TRC MO AVG, mg/L	TRC DAILY MX, mg/L	DO DAILY MIN, mg/L
10/31/2012	6.5	7.2	1.6	8	16.5	7.6	9.34
11/30/2012	6.7	7.2	1.2	2	13.5	10	
12/31/2012	6.6	7.4	1.5	6	15.48	8.9	
1/31/2013	6.5	7.7	1	3	14.19	30	
2/28/2013	6.9	7.3	1	1	15.4	30	
3/31/2013	6.9	7.3	1	1	18.2	45	
4/30/2013	6.8	7.3	1	1	17.67	60	9.86
5/31/2013	6.9	7.3	2.5	5	17.4	60	9.7
6/30/2013	6.9	7.4	2	4	11.17	20	9.01
7/31/2013	6.9	7.4	10	29	14.7	30	8.55
8/31/2013	6.8	7.1	5	13	23.5	50	8.31
9/30/2013	6.6	7.3	11	40	20	30	8.5
10/31/2013	6.8	7.3	12	34	18	40	8.87
11/30/2013	6.8	7.3	48	540	15	30	
12/31/2013	6.6	7.4	10	38	19.03	50	
1/31/2014	6.6	7.5	3	2700	9.68	40	
2/28/2014	6.7	7.6	1	6300	15	120	
3/31/2014	6.6	7.5	1	1	27	140	
4/30/2014	6.7	7.2	1	2	14	110	10.07
5/31/2014	6.7	7.3	1	2	25	300	9.77
6/30/2014	6.7	7.6	1	3	19	140	9.07
7/31/2014	6.92	7.6	3	30	39	190	8.6
8/31/2014	7.03	7.46	3	27	13	30	8.8
9/30/2014	6.76	7.49	5	874	8	38	9.2
10/31/2014	6.81	7.68	6	3500	12	60	9.7
11/30/2014	6.92	7.67	13	98	15	75	
12/31/2014	6.89	8.2	5	108	38	645	
1/31/2015	6.72	7.39	5	28	19	65	
2/28/2015	7.01	7.42	5	24	20	50	
3/31/2015	6.81	8.25	8	958	18	45	
4/30/2015	6.67	7.33	7	56	18	40	10
5/31/2015	6.71	7.93	1	2	14	35	8.7
6/30/2015	7.17	7.54	6	1060	16	100	9.1
7/31/2015	7.15	8.16	6	258	16	50	7.8
8/31/2015	6.89	7.67	7	2514	9	25	8.7
9/30/2015	6.81	7.55	13	151	13	190	8.8
10/31/2015	6.61	7.5	2	71	6	60	9.5
11/30/2015	6.51	7.67	36	1842	25	130	
12/31/2015	6.75	7.73	32	338	28	115	
1/31/2016	6.51	7.45	11	406	25	65	
2/28/2016	6.5	7.44	1	26	24	65	

Monitoring Period End Date	pH MIN	pH MAX	Fecal Coliform MO GEO MN	Fecal Coliform DAILY MX	TRC MO AVG, mg/L	TRC DAILY MX, mg/L	DO DAILY MIN, mg/L
3/31/2016	6.5	8.12	2	26	19	125	
4/30/2016	6.62	7.56	1	3	9	55	13.3
5/31/2016	6.85	7.66	13	195	15	290	9.8
6/30/2016	6.58	7.65	7	192	6	200	8.2
7/31/2016	6.56	7.5	5	1120	9	55	8.3
8/31/2016	6.57	7.92	3	700	12	75	8.4
9/30/2016	6.53	7.63	3	59	16	85	8.4
10/31/2016	6.03	7.95	19.63	1630	13	30	8.9
11/30/2016	6.54	7.92	12.19	1090	20	65	
12/31/2016	6.67	7.52	1.75	6	13	30	
1/31/2017	6.76	7.53	2.2	52	15	80	
2/28/2017	6.66	7.63	1.19	4	9	30	
3/31/2017	6.59	7.41	1	1	8	25	
4/30/2017	6.6	7.41	1.21	5	7	35	10.3
5/31/2017	6.68	7.45	1	1	10	25	9.3
6/30/2017	6.8	7.31	1.09	3	12	20	9.1
7/31/2017	7.06	7.58	1.49	91	11	20	9
8/31/2017	7.09	7.68	1.81	47	15	20	9
9/30/2017	6.98	7.44	4.34	800	16	25	9
10/31/2017	6.7	7.4	1	1	12	25	8.9
2005 Permit Limit	**6.5**	**8.3**	**200 cfu/100 ml**	**400 cfu/100 ml**	**79 ug/l**	**140 ug/l**	**5**
Minimum	6.03	7.1	1	1	6	7.6	7.8
Maximum	7.17	8.25	48	6300	39	645	13.3
Average	6.73	7.54	6.16	461.15	16.11	77.70	9.16
# Measurements	61	61	61	58	58	58	36
Exceedances	1	0	0	15	0	6	0

Monitoring Period End Date	Aluminum MO AVG, ug/L	Copper MO AVG, ug/L	Copper DAILY MX, ug/L	Ammonia MO AVG, mg/L	Ammonia MO AVG, mg/L	Ammonia WKLY AVG, mg/L
10/31/2012	100	10	10		1.6	2.6
11/30/2012	742	10	10	1.5		
12/31/2012	880	10	10	1.5		
1/31/2013	1070	10.4	12	1.62		4.1
2/28/2013	714	10.5	12	1.76		4.4
3/31/2013	732	10	10	1.92		3.4
4/30/2013	100	10	10	1.35		1.9
5/31/2013	100	10	10	1.9		1.2
6/30/2013	100	10	10		1.8	
7/31/2013	100	11	13		0.65	
8/31/2013	100	10.75	13		0.9	
9/30/2013	100	10	10		1.8	
10/31/2013	100	10	10		1.17	
11/30/2013	1080	0.01	0.01	1.04		1.3
12/31/2013	1190	12.67	13	2.32		2.4
1/31/2014	1000	10	20	1.84		2.6
2/28/2014	240	50	50	0.78		0.9
3/31/2014	118	6.5	9	0.76		1.5
4/30/2014	249	7.4	11	0.58		0.79
5/31/2014	116	5.1	6.2	1.19		1.9
6/30/2014	168	4.25	4.8		0.81	
7/31/2014	100	3	5		0.77	
8/31/2014	0	5	7		0.62	
9/30/2014	179	3	4		1.83	
10/31/2014	100	3	5		4.9	
11/30/2014	632	8	16	6.93		8.9
12/31/2014	1032	13	16	4.87		7.5
1/31/2015	693	13	14	4.38		4.9
2/28/2015	1031	11	12	4.88		5.2
3/31/2015	829	11	25	4.03		4.4
4/30/2015	934	7	8	2.5		2.6
5/31/2015	205	6	7	2.03		2.5
6/30/2015	209	5	7		2.57	
7/31/2015	354	6	17		2.6	
8/31/2015	164	5	10		4.02	
9/30/2015	126	4	6		2.7	
10/31/2015	452	7	10		3.3	
11/30/2015	1128	12	15	4.82		5.2
12/31/2015	1280	13	20	3.5		5.4
1/31/2016	797	14	16	3.7		5.4
2/28/2016	890	13	16	3		3.3

Monitoring Period End Date	Aluminum MO AVG, ug/L	Copper MO AVG, ug/L	Copper DAILY MX, ug/L	Ammonia MO AVG, mg/L	Ammonia MO AVG, mg/L	Ammonia WKLY AVG, mg/L
3/31/2016	933	6	9	2.07		2.5
4/30/2016	174	4	6	2.38		3
5/31/2016	280	4	5	3.28		3.8
6/30/2016	150	2	4		1.52	
7/31/2016	88	4	4		1.92	
8/31/2016	190	2	3		4.4	
9/30/2016	750	3	3		5.75	
10/31/2016	200	3	5		3.69	
11/30/2016	1400	6	7	4.02		4.4
12/31/2016	1	5	6	5.35		6
1/31/2017	900	4	5	3.13		4
2/28/2017	700	5	11	1.96		2.3
3/31/2017	828	4	9	2.59		3.3
4/30/2017	1260	1	2	2.21		3.7
5/31/2017	187	2	3	3.02		3.9
6/30/2017	186	1	3		3.09	
7/31/2017	117	1	2		3.67	
8/31/2017	186	1	3		1.7	
9/30/2017	309	2	3		2.58	
10/31/2017	225	0	1		1.24	
2005 Permit Limit	**Report, ug/l**	**37 ug/L**	**53 ug/L**	**Report**	**12 mg/L**	**Report**
Minimum	0	0	0.01	0.58	0.62	0.79
Maximum	1400	50	50	6.93	5.75	8.9
Average	480.30	7.39	9.57	2.78	2.37	3.56
# Measurements	58	61	61	33	26	34
Exceedances	N/A	1	0	N/A	0	N/A

Monitoring Period End Date	Total Phosphorus MO AVG (Median), mg/L	Total Phosphorus MO AVG (Median), mg/L	Total Phosphorus DAILY MX, mg/L	Total Phosphorus MO AVG, mg/L	Phosphorus MO AVG, mg/L	Phosphorus MO AVG, lbs/day	Phosphorus Daily Max, mg/L	Phosphorus Daily Max, lbs/day
10/31/2012				0.06				
11/30/2012					0.65	3.9	0.87	5.9
12/31/2012					0.73	4	1	6.05
1/31/2013					0.59	3.52	0.7	5.03
2/28/2013					0.69	3.71	1.24	8.2
3/31/2013					0.35	3	0.46	4.9
4/30/2013	0.06	0.06	0.09					
5/31/2013				0.065				
6/30/2013				0.065				
7/31/2013				0.08				
8/31/2013				0.07				
9/30/2013				0.095				
10/31/2013				0.2				
11/30/2013					0.87	4	1.18	8
12/31/2013					0.73	4.06	1.13	7.28
1/31/2014					0.66	3.83	0.85	6.2
2/28/2014					0.37	1.4	0.5	3.1
3/31/2014					0.17	0.6	0.1	0.7
4/30/2014	0.07	0.07	0.14					
5/31/2014				0.08				
6/30/2014				0.075				
7/31/2014				0.1				
8/31/2014				0.1				
9/30/2014				0.08				
10/31/2014				0.04				
11/30/2014			0.2		0.39	6.4	1.67	14.1
12/31/2014					0.75	7.8	1.55	15.9
1/31/2015					0.51	4.3	0.76	7.2
2/28/2015					0.6	3.5	0.67	3.9
3/31/2015					0.25	2.6	1.07	8.3
4/30/2015	0.009	0.009	0.09					
5/31/2015				0.09				
6/30/2015				0.06				
7/31/2015				0.05				
8/31/2015				0.04				
9/30/2015				0.06		5.2	1.84	11
10/31/2015						4.6	0.93	7.2
11/30/2015			0.2		0.87	3.5	0.61	5.1
12/31/2015					0.79	2.9	0.54	3.9
1/31/2016					0.62	4.2	0.98	8.2
2/28/2016					0.62			

Monitoring Period End Date	Total Phosphorus MO AVG (Median), mg/L	Total Phosphorus MO AVG (Median), mg/L	Total Phosphorus DAILY MX, mg/L	Total Phosphorus MO AVG, mg/L	Phosphorus MO AVG, mg/L	Phosphorus MO AVG, lbs/day	Phosphorus Daily Max, mg/L	Phosphorus Daily Max, lbs/day
3/31/2016					0.19			
4/30/2016	0.006	0.006		0.07				
5/31/2016				0.07				
6/30/2016				0.07				
7/31/2016				0.07				
8/31/2016				0.1				
9/30/2016				0.14				
10/31/2016								
11/30/2016					0.54	2.7	0.56	3.5
12/31/2016					0.31	1.5	0.39	2.4
1/31/2017					0.17	0.7	0.14	1.1
2/28/2017					0.18	0.6	0.15	1.4
3/31/2017					0.25	1.3	0.57	4.8
4/30/2017	0.02	0.02						
5/31/2017				0.04				
6/30/2017				0.04				
7/31/2017				0.06				
8/31/2017				0.06				
9/30/2017				0.06				
10/31/2017				0.06				
2005 Permit Limit	**0.1 mg/L**	**0.1 mg/L**	**0.2 mg/L**	**0.1 mg/L**	**1 mg/L**	**Report**	**Report**	**Report**
Minimum	0.006	0.006	0.09	0.04	0.17	0.6	0.1	0.7
Maximum	0.07	0.07	0.2	0.2	0.87	7.8	1.84	15.9
Average	0.04	0.04	0.14	0.08	0.51	3.30	0.89	6.15
# Measurements	0	0	0	1	23	23	23	23
Exceedances	0	0	0	2	N/A	N/A	N/A	N/A

Monitoring Period End Date	Cadmium	Copper	Lead	Nickel	Zinc	Ammonia
	Quartely WET Test	Quartely WET Test	Quartely WET Test	Quartely WET Test	Quartely WET Test	Quartely WET Test
10/31/2012						
11/30/2012						
12/31/2012	<0.0005	0.007	0.0006	0.002	0.018	3.9
1/31/2013						
2/28/2013						
3/31/2013	<0.0005	0.006	<0.0005	0.002	0.015	3.9
4/30/2013						
5/31/2013						
6/30/2013	<0.0005	0.003	<0.0005	0.003	0.008	0.84
7/31/2013						
8/31/2013						
9/30/2013	<0.0005	0.004	<0.0005	0.002	0.012	1.8
10/31/2013						
11/30/2013						
12/31/2013	<0.0005	0.011	<0.0005	0.002	0.034	2.6
1/31/2014						
2/28/2014						
3/31/2014	<0.0005	0.007	<0.0005	0.002	0.021	1.2
4/30/2014						
5/31/2014						
6/30/2014	<0.0005	0.005	<0.0005	0.002	0.012	1.1
7/31/2014						
8/31/2014						
9/30/2014	<0.0005	<0.002	<0.0005	0.002	0.013	2.4
10/31/2014						
11/30/2014						
12/31/2014	<0.0005	0.012	<0.0005	0.003	0.021	7.3
1/31/2015						
2/28/2015						
3/31/2015	<0.0005	0.011	<0.0005	0.003	0.023	5.8
4/30/2015						
5/31/2015						
6/30/2015	<0.0005	0.005	<0.0005	0.002	0.013	2.8
7/31/2015						
8/31/2015						
9/30/2015	<0.0005	0.005	<0.0005	0.002	0.016	3.9
10/31/2015						
11/30/2015						
12/31/2015	<0.0005	0.018	<0.0005	0.003	0.024	4.2
1/31/2016						
2/28/2016						

	Cadmium	Copper	Lead	Nickel	Zinc	Ammonia
Monitoring Period End Date	**Quartely WET Test**	**Quartely WET Test**	**Quartely WET Test**	**Quartely WET Test**	**Quartely WET Test**	**Quartely WET Test**
3/31/2016	<0.0005	0.009	0.0005	0.003	0.02	2.6
4/30/2016						
5/31/2016						
6/30/2016	<0.0005	0.002	<0.0005	0.003	0.014	1.7
7/31/2016						
8/31/2016						
9/30/2016	<0.0005	0.0025	<0.0005	0.003	0.006	9.4
10/31/2016						
11/30/2016						
12/31/2016	<0.0001	0.0056	<0.0003	0.0028	0.025	7.2
1/31/2017						
2/28/2017						
3/31/2017	<0.0001	0.0036	<0.0002	0.0027	0.019	
4/30/2017						
5/31/2017						
6/30/2017	<0.0003	0.0019	<0.0003	0.0037	0.0013	
7/31/2017						
8/31/2017						
9/30/2017	<0.0003	0.002	<0.0003	0.0023	0.01	3.7
10/31/2017						
2005 Permit Limit						
Minimum						
Maximum						
Average						
# Measurements						
Exceedances						

Appendix B. Ambient Data

Assabet River

	Al, mg/l	Cd, mg/l	Cu, mg/l	Pb, mg/l	Ni, mg/l	Zn, mg/l
Sep-17	0.024	<0.0001	0.0024	0.0003	0.0037	<0.1
Jun-17	0.065	ND	0.0035	0.001	0.0027	0.0089
Mar-17	0.0037	<0.0001	0.0018	0.0003	0.003	0.0096
Dec-16	0.058	<0.0001	0.0028	0.0007	0.0034	0.024
Sep-16	<0.02	<0.0005	0.0015	<0.0005	0.005	0.004
Jun-16	0.048	<0.0005	0.003	0.0008	0.003	0.008
Mar-16	0.056	<0.0005	ND	0.0005	ND	0.007
Dec-15	0.044	<0.0005	0.003	0.0005	0.003	0.012
Sep-15	<0.002	<0.0005	0.002	<0.0005	0.004	0.005
Jun-15	0.14	<0.0005	0.008	0.002	0.003	0.04
Mar-15	0.04	<0.0005	0.001	<0.0005	0.003	0.011
Dec-14	0.11	<0.0005	0.003	0.0008	<0.002	0.011
Sep-14	<0.02	<0.0005	0.001	<0.0005	0.003	<0.002
Jun-14	0.058	<0.0005	0.001	0.0009	0.002	0.004
Mar-14	0.045	<0.0005	0.003	0.0005	0.003	0.021
Dec-13	0.037	<0.0005	0.002	<0.0005	<0.002	0.006
Sep-13	ND	<0.0005	0.004	ND	0.003	0.005
Jun-13	0.15	<0.0005	0.016	<0.0005	<0.002	0.007
Mar-13	0.052	<0.0005	0.008	0.0008	<0.002	0.009
Dec-12	0.052	<0.0005	0.007	0.0009	0.003	0.009
Sep-12	0.024	<0.0005	0.006	ND	0.003	0.003
Jun-12	0.092	<0.0005	0.013	0.002	0.003	0.016
Mar-12	0.13	<0.0005	0.001	0.001	<0.002	0.006
Median, mg/l	**0.054**	**bdl***	**0.003**	**0.0008**	**bdl***	**0.008**

Appendix C. Statistical Approach to Characterization of the Effluent

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

To account for this, EPA has developed a statistical approach to characterizing effluent variability when the monitoring dataset includes 10 or more samples.[1] As "experience has shown that daily pollutant discharges are generally lognormally distributed," *TSD* at App. E, EPA uses a lognormal distribution to model the shape of the observed data, unless analysis indicates a different distributional model provides a better fit to the data. The model parameters (mean and variance) are derived from the monitoring data. The model parameter μ is the mean of the natural logs of the monitoring data values, while σ is the standard deviation of the natural logs of the monitoring data values.

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

$$X_p = \exp(\mu_y + z_p \times \sigma_y), \qquad \text{where} \quad \mu_y = \text{mean of Y}$$

σ_y = standard deviation of Y

Y = ln[X]

z_p = the z-score for percentile "p"

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

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

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

Datasets including non-detect values

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

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

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

Appendix C. Statistical Approach to Characterization of the Effluent

For the delta-lognormal, the p^{th} percentile of X, referred to here as X_p^*, is given by

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

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

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

where δ is the proportion of non-detects in the monitoring dataset.

k = total number of dataset
r = number of non-detect values in the dataset
$\delta = r/k$

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

Example calculations of z_p^* for 95th percentile

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

Appendix D - 95th Percentile Calculations
Maynard Water Pollution Control Facility

Reasonable Potential Analysis

data with ND, >10 samples, lognormal distribution

Dilution Factor:	6.65

Date	Al* (ug/l)	lnAl (ug/l)	$(y_i - u_y)^2$
1/31/2012	1020	6.9276	1.699101
2/29/2012	952	6.8586	1.523997
3/31/2012	848	6.7429	1.251754
4/30/2012	100	4.6052	1.038141
5/31/2012	100	4.6052	1.038141
6/30/2012	100	4.6052	1.038141
7/31/2012	107.5	4.6775	0.895998
8/31/2012	100	4.6052	1.038141
9/30/2012	100	4.6052	1.038141
10/31/2012	100	4.6052	1.038141
11/30/2012	742	6.6093	0.97079
12/31/2012	880	6.7799	1.336011
1/31/2013	1070	6.9754	1.826151
2/28/2013	714	6.5709	0.896469
3/31/2013	732	6.5958	0.944236
4/30/2013	100	4.6052	1.038141
5/31/2013	100	4.6052	1.038141
6/30/2013	100	4.6052	1.038141
7/31/2013	100	4.6052	1.038141
8/31/2013	100	4.6052	1.038141
9/30/2013	100	4.6052	1.038141
10/31/2013	100	4.6052	1.038141
11/30/2013	1080	6.9847	1.851379
12/31/2013	1190	7.0817	2.124733
1/31/2014	1000	6.9078	1.647868
2/28/2014	240	5.4806	0.02057

Al- (Lognormal distribution, ND)

Daily Maximum Effluent Derivation (some measurements < detection limit)	
Detection Limit** =	5.0
u_y = Avg of Nat. Log of daily Discharge (mg/L) =	5.62406
S $(y_i - u)^2$ =	89.19226
k = number of daily samples =	60
r = number of non-detects =	1
s_y^2 = estimated variance = $(S[(y_i - u_y)^2]) / (k-r-1)$ =	1.53780
s_y = standard deviation = square root s_y^2 =	1.24008
δ = number of nondetect values/number of samples =	0.01667
z 99th percentile=z-score[$(0.99-\delta)/(1-\delta)$] =	2.32004
z 95th percentile=z-score[$(0.95-\delta)/(1-\delta)$] =	1.636691647
Daily Max = exp (u_y + z-score*s_y)	
99th Percentile Daily Max Estimate=	**4920.1314 ug/l**
99th Percentile Daily Max Estimate including diluti	**739.8694 ug/l**
95th Percentile Daily Max Estimate =	**2108.4119 ug/l**
95th Percentile Daily Max Estimate including diluti	**317.0544 ug/l**

** Detection limit here is the detection limit that resulted in the greatest number of Non Dete

3/31/2014	118	4.7707	0.728253
4/30/2014	249	5.5175	0.011366
5/31/2014	116	4.7536	0.757722
6/30/2014	168	5.1240	0.250098
7/31/2014	100	4.6052	1.038141
8/31/2014	0		
9/30/2014	179	5.1874	0.190686
10/31/2014	100	4.6052	1.038141
11/30/2014	632	6.4489	0.68034
12/31/2014	1032	6.9393	1.729729
1/31/2015	693	6.5410	0.84083
2/28/2015	1031	6.9383	1.72718
3/31/2015	829	6.7202	1.201562
4/30/2015	934	6.8395	1.477232
5/31/2015	205	5.3230	0.090633
6/30/2015	209	5.3423	0.079371
7/31/2015	354	5.8693	0.06014
8/31/2015	164	5.0999	0.274781
9/30/2015	126	4.8363	0.620598
10/31/2015	452	6.1137	0.239728
11/30/2015	1128	7.0282	1.971607
12/31/2015	1280	7.1546	2.342593
1/31/2016	797	6.6809	1.11681
2/28/2016	890	6.7912	1.362261
3/31/2016	933	6.8384	1.474629
4/30/2016	174	5.1591	0.216232
5/31/2016	280	5.6348	0.000115
6/30/2016	150	5.0106	0.376293
7/31/2016	88	4.4773	1.314979
8/31/2016	190	5.2470	0.142158
9/30/2016	750	6.6201	0.992038
10/31/2016	200	5.2983	0.10611
11/30/2016	1400	7.2442	2.624935
12/31/2016	1	0.0000	31.63008

Reasonable Potential Analysis for Maynard WWTP														
data with ND, >10 samples, lognormal distribution														
Dilution Fac	12.67													
						Pb- (Lognormal distribution, ND)								
Date	Pb* (ug/l)	lnPb (ug/l)	$(y_i - u_y)^2$			Daily Maximum Effluent Derivation (some measurements < detection limit)								
12/1/2016	0					Detection Limit** =			0.5					
9/1/2016	0					u_y = Avg of Nat. Log of daily Discha			-4.05586					
6/1/2016	0					S $(y_i - u)^2$ =			11.30786					
3/1/2016	0.5	-0.6931				k = number of daily samples =			18					
12/1/2015	0					r = number of non-detects =			16					
9/1/2015	0					s_y^2 = estimated variance = (S[$(y_i - u_y)$			11.30786					
6/1/2015	0					s_y = standard deviation = square root s			3.36272					
3/1/2015	0					δ = number of nondetect values/numb			0.88889					
12/1/2014	0					z 99th percentile=z-score[(0.99-δ)/(1-			1.34076					
9/1/2014	0					z 95th percentile=z-score[(0.95-δ)/(1-			0.1256613					
6/1/2014	0													
3/1/2014	0					**Daily Max = exp (u_y + z-score*s_y)**								
12/1/2013	0													
9/1/2013	0					**99th Percentile Daily Max Estimate**			**1.5726**	**ug/l**				
6/1/2013	0					**99th Percentile Daily Max Estimate**			**0.1241**	**ug/l**				
3/1/2013	0													
12/1/2012	0.0006	-7.4186	11.307865			**95th Percentile Daily Max Estimate**			**0.0264**	**ug/l**				
9/1/2012	0					**95th Percentile Daily Max Estimate**			**0.0021**	**ug/l**				
6/1/2012														
3/1/2012						** Detection limit here is the detection limit that resulted in the greatest number of Non D								

etects in the dataset		

Reasonable Potential Analysis for Maynard WWTP															
data with ND, >10 samples, lognormal distribution															
Dilution Facto	12.67														
						Ni- (Lognormal distribution, ND)									
Date	Ni* (ug/l)	lnNi (ug/l)	$(y_i - u_y)^2$			Daily Maximum Effluent Derivation (some measurements < detection limit)									
12/1/2016	2.8	1.0296	0.0219161			Detection Limit** =			2.0						
9/1/2016	3	1.0986	0.0471037			u_y = Avg of Nat. Log of daily Discha			0.88158						
6/1/2016	3	1.0986	0.0471037			S $(y_i - u)^2$ =			0.75381						
3/1/2016	3	1.0986	0.0471037			k = number of daily samples =			20						
12/1/2015	3	1.0986	0.0471037			r = number of non-detects =			1						
9/1/2015	2	0.6931	0.0355063			s_y^2 = estimated variance = (S[$(y_i - u_y)$			0.04188						
6/1/2015	2	0.6931	0.0355063			s_y = standard deviation = square root s			0.20464						
3/1/2015	3	1.0986	0.0471037			δ = number of nondetect values/numb			0.05000						
12/1/2014	3	1.0986	0.0471037			z 99th percentile=z-score[(0.99-δ)/(1-			2.30704						
9/1/2014	2	0.6931	0.0355063			z 95th percentile=z-score[(0.95-δ)/(1-			1.6198563						
6/1/2014	2	0.6931	0.0355063												
3/1/2014	2	0.6931	0.0355063			**Daily Max = exp (u_y + z-score*s_y)**									
12/1/2013	2	0.6931	0.0355063												
9/1/2013	2	0.6931	0.0355063			**99th Percentile Daily Max Estimate**			**3.8717**	**ug/l**					
6/1/2013	3	1.0986	0.0471037			**99th Percentile Daily Max Estimate**			**0.3056**	**ug/l**					
3/1/2013	2	0.6931	0.0355063												
12/1/2012	2	0.6931	0.0355063			**95th Percentile Daily Max Estimate**			**3.3638**	**ug/l**					
9/1/2012	3	1.0986	0.0471037			**95th Percentile Daily Max Estimate**			**0.2655**	**ug/l**					
6/1/2012	0														
3/1/2012	2	0.6931	0.0355063			** Detection limit here is the detection limit that resulted in the greatest number of Non Detects in the c									

lataset	

Reasonable Potential Analysis-Maynard WWTP
no ND, >10 data points, Lognormal distribution

Dilution Fa	12.67

Date	Zn (ug/L)	*Yi* ln Zn (ug/L)
12/1/2016	25	3.2189
9/1/2016	6	1.7918
6/1/2016	14	2.6391
3/1/2016	20	2.9957
12/1/2015	24	3.1781
9/1/2015	16	2.7726
6/1/2015	13	2.5649
3/1/2015	23	3.1355
12/1/2014	21	3.0445
9/1/2014	13	2.5649
6/1/2014	12	2.4849
3/1/2014	21	3.0445
12/1/2013	34	3.5264
9/1/2013	12	2.4849
6/1/2013	8	2.0794
3/1/2013	15	2.7081
12/1/2012	18	2.8904
9/1/2012	10	2.3026
6/1/2012	7	1.9459
3/1/2012	15	2.7081

Zinc

Estimated Daily Maximum Effluent Concentration

k = number of daily samples =	20
u_y = Avg of Nat. Log of daily	2.70405
s_y = Std Dev. of Nat Log of dai	0.44755
σ_y^2 = estimated variance = (SUI	0.2003
cv(x)= Coefficient of Variation	0.16551

99th Percentile Daily Max Estimate = exp (u_y + 2.326*s_y)

Estimated Daily Max 99th per	**42.3116 ug/L**
Estimated Daily Max includin	**3.3395 ug/L**

95th Percentile Daily Max Estimate = exp (u_y + 1.645*s_y)

Estimated Daily Max =	**31.1956 ug/L**
Estimated Daily Max includin	**2.4622 ug/L**

Appendix E Summary of Estuarine Data from 2017 CDM Smith/Army Corp Report* and 2017 EPA Field study

Summary of Estuarine Data from 2017 CDM Smith/Army Corp Report*

		6/25/2014 (dry weather)			8/10/2016 (wet/dry weather)		
Station ID	Station Name	Salinity (ppt)	TN (mg/L)	Chl 'a' (ug/l)	Salinity (ppt)	TN (mg/L)	Chl 'a' (ug/l)
M026U	U/S Amesbury	0.55	1.44	19	0.29	1.67	17
M026D	D/S Amesbury	1.02	1.35	27	0.42	1.534	23
M028U	U/S Salisbury WWTP	15.75	0.78	24	12.75	1.296	16
M028D	D/S Salisbury WWTP	23.37	0.70	21	28.14	1.081	42
M029U	U/S Newburyport	18.015	0.76	30	25.55	0.497	14
M029D	D/S Newburyport	20.555	0.54	27	24.83	0.473	14
M027	Shellfish Bed/Newburyport Boatramp	30.505	0.47	4	29.36	0.442	4.3
M030	Shellfish Bed (Newburyport)	23.555	0.58	17	29.75	0.47	6.6

*Merrimack River Watershed Assessment Study - Phase III Final Monitoring Data Report August 2017

Summary of Estuarine Data from 2017 EPA Field Study*

		7/31/2017 (dry weather)			8/14/2017 (dry weather)		
Station ID	Station Name	Salinity (ppt)	TN (mg/L)	Chl 'a' (µg/l)	Salinity (ppt)	TN (mg/L)	Chl 'a' (µg/l)
M018	Lawrence Community Boating, End of Dock in Lawrence, 1 Eaton Street	0.1	0.78	8	0.1	0.9	10
M025	Upstream of Merrimack Outfall	0.1	0.92	12	0.1	1.1	10
M026	Upstream of Amesbury Outfall	0.2	0.79	16	0.2	1	12
M028	Upstream of Newburyport	2.2	0.88	10	1	1.1	10
M029	Downstream of Newburyport Outfall	4.8	0.87	10	7	0.85	6
M030	Salisbury MA	15.3	0.73	7	2.8	1.2	11

		8/29/2017 (dry weather)			9/14/2017 (wet/dry weather)		
Station ID	Station Name	Salinity (ppt)	TN (mg/L)	Chl 'a' (µg/l)	Salinity (ppt)	TN (mg/L)	Chl 'a' (µg/l)
M018	Lawrence Community Boating, End of Dock in Lawrence, 1 Eaton Street	0.1	0.83	11	0.1	0.79	6
M025	Upstream of Merrimack Outfall	0.1	1.2	10	0.1	0.93	5
M026	Upstream of Amesbury Outfall	0.4	1	13	0.2	0.91	6
M028	Upstream of Newburyport	5.9	0.94	11	3.4	0.92	4
M029	Downstream of Newburyport Outfall	8.2	0.83	10	5.8	0.86	4

M030	Salisbury MA	15.3	0.62	8	9.6	0.73	4

Station ID	Station Name	9/26/2017 (dry weather)			10/11/2017 (dry weather)		
		Salinity (ppt)	TN (mg/L)	Chl 'a' (µg/l)	Salinity (ppt)	TN (mg/L)	Chl 'a' (µg/l)
M018	Lawrence Community Boating, End of Dock in Lawrence, 1 Eaton Street	0.1	1.2	24	0.1	1.3	9
M025	Upstream of Merrimack Outfall	0.1	1.5	5	0.2	1.8	10
M026	Upstream of Amesbury Outfall	0.2	1.5	7	0.2	1.9	6
M028	Upstream of Newburyport	7.2	1.2	2	4.2	1.7	5
M029	Downstream of Newburyport Outfall	10.8	1.1	2	17.3	0.87	3
M030	Salisbury MA	17.9	0.74	2	9.8	1.3	3

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION 1
OFFICE OF ECOSYSTEM PROTECTION
5 POST OFFICE SQUARE
BOSTON, MASSACHUSETTS 02109

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO WATERS OF THE UNITED STATES UNDER SECTIONS 301 AND 402 OF THE CLEAN WATER ACT, AS AMENDED, AND SECTIONS 27 AND 43 OF THE MASSACHUSETTS CLEAN WATERS ACT, AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE CLEAN WATER ACT.

DATE OF NOTICE: October 25, 2018

PERMIT NUMBER: **MA0101001**

PUBLIC NOTICE NUMBER: MA – 001 -19

NAME AND MAILING ADDRESS OF APPLICANT:

Aaron Miklosko, Director of Public Works
Town of Maynard
Department of Public Works
195 Main Street
Maynard, Massachusetts 01754

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Maynard Water Pollution Control Facility
18 Pine Hill Road
Maynard, Massachusetts 01754

RECEIVING WATER: **Assabet River**

The U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) have cooperated in the development of a draft permit for the Maynard Water Pollution Control Facility, which discharges treated sanitary wastewater. Sludge from this facility is thickened and trucked to the Greater Lawrence Sanitary District in Lawrence, MA for disposal. The effluent limits and permit conditions imposed have been drafted to assure compliance with the Clean Water Act, 33 U.S.C. sections 1251 et seq., the Massachusetts Clean Waters Act, G.L. c. 21, §§ 26-53, 314 CMR 3.00, and State Surface Water Quality Standards at 314 CMR 4.00. EPA has requested that the State certify this draft permit pursuant to Section 401 of the Clean Water Act and expects that the draft permit will be certified.

INFORMATION ABOUT THE DRAFT PERMIT:

The draft permit and explanatory fact sheet may be obtained at no cost at http://www.epa.gov/region1/npdes/draft_permits_listing_ma.html or by contacting:

Betsy Davis
U.S. Environmental Protection Agency – Region 1
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109-3912
Telephone: (617) 918-1576

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

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

All persons, including applicants, who believe any condition of this draft permit is inappropriate, must raise all issues and submit all available arguments and all supporting material for their arguments in full by November 23, 2018, to the address listed above. Any person, prior to such date, may submit a request in writing to EPA and MassDEP for a public hearing to consider this draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on this draft permit, the Regional Administrator will respond to all significant comments and make the responses available to the public at EPA's Boston office.

FINAL PERMIT DECISION:

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

LEALDON LANGLEY, DIRECTOR
WETLANDS AND WASTEWATER PROGRAM
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

KEN MORAFF, DIRECTOR
OFFICE OF ECOSYSTEM PROTECTION
EPA-REGION 1