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 Hudson
Department of Public Works

is authorized to discharge from the facility located at

Hudson Wastewater Treatment Facility
One Municipal Drive
Hudson, MA 01749

to receiving water named

Assabet River

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

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

This permit and the authorization to discharge expire at midnight five 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 (**23 pages including effluent limitations and monitoring requirements); **Attachment A** (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages); **Attachment B** (USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013, 7 pages); **Attachment C** (Reassessment of Technically Based Industrial Discharge Limits, 9 pages); **Attachment D** (NPDES Permit Requirement for Industrial Pretreatment Annual Report, 2 pages) and **Part II (**NPDES Part II Standard Conditions, January, 2007, 25 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
Boston, MA	Commonwealth of Massachusetts
	Boston, MA

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

DRAFT

PART I

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number **001** to the Assabet River. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	**EFFLUENT LIMITS**					**MONITORING REQUIREMENTS** [1]	
PARAMETER	**AVERAGE MONTHLY** [2]	**AVERAGE WEEKLY** [2]	**AVERAGE MONTHLY** [2]	**AVERAGE WEEKLY** [2]	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE** [6]
EFFLUENT FLOW [3]	*********	*********	3.0 MGD	*********	*********	CONTINUOUS	RECORDER
EFFLUENT FLOW [3]	*********	*********	Report MGD	*********	Report MGD	CONTINUOUS	RECORDER
BOD_5 [4] (April 1 - October 31)	332 lbs/day	442 lbs/day	15 mg/L	20 mg/L	25 mg/L	2/WEEK	24-HOUR COMPOSITE
BOD_5 [4] (November 1 - March 31)	663 lbs/day	995 lbs/day	30 mg/L	45 mg/L	Report mg/L	2/WEEK	24-HOUR COMPOSITE
TSS [4] (April 1-October 31)	332 lbs/day	442 lbs/day	15 mg/L	20 mg/L	25 mg/L	2/WEEK	24-HOUR COMPOSITE
TSS [4] (November 1 - March 31)	663 lbs/day	995 lbs/day	30 mg/L	45 mg/L	Report mg/L	2/WEEK	24-HOUR COMPOSITE
pH RANGE [5]	6.5 - 8.3 S.U. (SEE PERMIT PARAGRAPH I.A.1.b.)					3/DAY	GRAB
TOTAL RESIDUAL CHLORINE [5,7]	*********	**********	35 µg/L	*********	61 µg/L	2/DAY	GRAB
ESCHERICHIA COLI [5,8]	*********	**********	126 cfu/100 ml	*********	409 cfu/100 ml	2/WEEK	GRAB
TOTAL COPPER [9]	*********	*********	17.0 µg/L	*********	23.0 µg/L	1/MONTH	24-HOUR COMPOSITE
TOTAL ALUMINUM [10]	*********	*********	87 µg/L	*********	Report mg/L	1/MONTH	24-HOUR COMPOSITE
DISSOLVED OXYGEN (April 1-October 31)	NOT LESS THAN 6.0 mg/l (SEE PERMIT PARAGRAPH I.A.1.i.)					1/DAY	GRAB

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A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number **001** to the Assabet River. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS					MONITORING REQUIREMENTS [1]	
PARAMETER	**AVERAGE MONTHLY [2]**	**AVERAGE WEEKLY[2]**	**AVERAGE MONTHLY [2]**	**AVERAGE WEEKLY[2]**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE[6]**
AMMONIA-NITROGEN (June 1 – October 31)	*********	*********	3 mg/L	3 mg/L	5 mg/L	2/WEEK	24-HOUR COMPOSITE
AMMONIA-NITROGEN (November 1 - May 31)	*********	*********	10.0 mg/L	Report mg/L	*********	1/WEEK	24-HOUR COMPOSITE
PHOSPHORUS, TOTAL (April 1 - October 31)	Report lbs/day	*********	0.1 mg/L	*********	Report mg/L	3/WEEK	24-HOUR COMPOSITE
PHOSPHORUS, TOTAL (November 1 - March 31)	Report lbs/day	*********	0.2 mg/L	*********	Report mg/L	1/WEEK	24-HOUR COMPOSITE
TOTAL KJELDAHL NITROGEN, TOTAL NITRATE/NITRITE, TOTAL NITROGEN[11]	Report lbs/day	*********	Report mg/L	*********	Report mg/L	QUARTERLY	24-HOUR COMPOSITE
BIS (2-ETHYLHEXYL)[12,13] PHTHALATE	Report lbs/day	*********	Report µg/L	*********	Report µg/L	1/MONTH	24-HOUR COMPOSITE

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A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number **001** to the Assabet River. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS					MONITORING REQUIREMENTS [1]	
PARAMETER	**AVERAGE MONTHLY [2]**	**AVERAGE WEEKLY [2]**	**AVERAGE MONTHLY [2]**	**AVERAGE WEEKLY [2]**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE [6]**
WHOLE EFFLUENT TOXICITY [14, 15, 16, 17, 18, 19]	Acute $LC_{50} \geq 100\%$ Chronic C-NOEC $\geq 31\%$					4/YEAR	24-HOUR COMPOSITE
Hardness [17]	**********	**********	**********	**********	Report mg/L	4/YEAR	24-HR COMP
Total Organic Carbon [17]	**********	**********	**********	**********	Report mg/L	4/YEAR	24-HR COMP
Total Recoverable Aluminum [17]	**********	**********	**********	**********	Report mg/L	4/YEAR	24-HR COMP
Total Recoverable Cadmium [17]	**********	**********	**********	**********	Report mg/L	4/YEAR	24-HR COMP
Total Recoverable Copper [17]	**********	**********	**********	**********	Report mg/L	4/YEAR	24-HR COMP
Total Recoverable Nickel [17]	**********	**********	**********	**********	Report mg/L	4/YEAR	24-HR COMP
Total Recoverable Lead [17]	**********	**********	**********	**********	Report mg/L	4/YEAR	24-HR COMP
Total Recoverable Zinc [17]	**********	**********	**********	**********	Report mg/L	4/YEAR	24-HR COMP

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A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Assabet River. The receiving water shall be monitored as specified below.

CHARACTERISTIC	**AMBIENT MONITORING REQUIREMENT**		
PARAMETER	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
Hardness [18]	Report mg/L	4/YEAR	Grab
Alkalinity [18]	Report mg/L	4/YEAR	Grab
Field pH [19]	Report mg/L	4/YEAR	Grab
Field Specific Conductance [19]	Report mg/L	4/YEAR	Grab
Total Ammonia Nitrogen [18]	Report mg/L	4/YEAR	Grab
Total Organic Carbon [18]	Report mg/L	4/YEAR	Grab
Total Recoverable Aluminum [18]	Report mg/L	4/YEAR	Grab
Total Recoverable Cadmium [18]	Report mg/L	4/YEAR	Grab
Total Recoverable Copper [18]	Report mg/L	4/YEAR	Grab
Total Recoverable Nickel [18]	Report mg/L	4/YEAR	Grab
Total Recoverable Lead [18]	Report mg/L	4/YEAR	Grab
Total Recoverable Zinc [18]	Report mg/L	4/YEAR	Grab

Footnotes:

1. Effluent sampling shall be of the discharge. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

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

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

2. In calculating and reporting the average weekly and 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 detection limit for the purposes of calculating averages.

3. Report annual average, monthly average, and the maximum daily flow. 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.

4. Sampling required for influent and effluent.

5. Required for State Certification.

6. 24-hour composite samples will consist of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow.

7. Total residual chlorine monitoring is required whenever chlorine is added to the treatment process (i.e. TRC sampling is not required if chlorine is not added for disinfection or other purpose). The limitations are in effect year-round.

   The minimum level (ML) for total residual chlorine is defined as 20 µg/L. This value is the minimum level for chlorine using EPA approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G. One of these methods must be used to determine total residual chlorine. For effluent limitations less than 20 µg/L, the compliance level will be the ML. Sampling results less than the detection limit shall be reported as "≤ [detection limit]" on the Discharge Monitoring Report.

   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.

8. The monthly average limit for E. coli is expressed as a geometric mean. E. coli monitoring shall be conducted concurrently with a total residual chlorine sample.

9. The minimum level (ML) for copper is defined as 3 µg/l. This value is the minimum level for copper using the Furnace Atomic Absorption analytical method (EPA Method 220.2). This method or another EPA-approved method with an equivalent or lower ML shall be used. For an effluent limitation less than the ML, the compliance level will be the ML. Sampling results less than the detection limit shall be reported as "≤ [detection limit]" on the Discharge Monitoring Report.

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

11. Ammonia nitrogen, total Kjeldahl nitrogen and total nitrate + 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

12. See **Special Conditions, Part H**

13. The minimum level (ML) for bis (2-ethylhexyl) phthalate is defined as 2.5 µg/l. This value is the minimum level for bis (2-ethylhexyl) phthalate using the gas chromatography/mass spectrometry analytical method (EPA Method 625). This method or another EPA-approved method with an equivalent or lower ML shall be used. Sampling results less than the detection limit shall be reported as "≤ [detection limit]" on the Discharge Monitoring Report.

14. The permittee shall conduct acute and chronic toxicity tests *four* times per year. The permittee shall test the daphnid, Ceriodaphnia dubia, only. Toxicity test samples shall be collected during the second week of the months of February, May, August and November. The test results shall be submitted by the last day of the month following the completion of the test. The results are due March 31, June 30, September 30 and December 31, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachments A & B** of this permit.

Test Dates Second Week in	**Submit Results By:**	**Test Species**	**Acute Limit LC_{50}**	**Chronic Limit C-NOEC**
February May August November	March 31 June 30 September 30 December 31	Ceriodaphnia dubia (daphnid)	≥ 100%	≥ 31%

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

16. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction, based on a statistically significant difference from dilution control, at a specific time of observation as determined from hypothesis testing. As described in the EPA WET Method Manual EPA 821-R-02-013, Section 10.2.6.2, all test results are to be reviewed and reported in accordance with EPA guidance on the evaluation of the concentration-response relationship. The **31**% or greater" limit is defined as a sample which is composed of **31**% (or greater) effluent, the remainder being dilution water.

17. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachments A & B (Toxicity Test Procedure and Protocol**) **Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance, which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. (see page 4 in https://www3.epa.gov/region1/npdes/permits/generic/Alternatedilutionwaterguidance.pdf).

    If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachments A & B**. Any modification or revocation to this guidance will be transmitted to the permittees. However, at any time, the permittee may choose to contact EPA-Region 1 directly using the approach outlined in **Attachments A & B**.

18. For each whole effluent toxicity test, the permittee shall report on the appropriate discharge monitoring report (DMR) the concentrations of certain parameters listed in Table A.1 found in the 100 percent effluent and ambient samples. All these

aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachments A & B**. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report.

19. When receiving water samples are collected for WET test dilution water, those samples shall be tested for pH and at the site and the results reported on the appropriate DMR.

Part I.A.1. (Continued)

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

b. The pH of the effluent shall not be less than 6.5 or greater than 8.3 at any time.

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.

e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.

f. The permittee shall minimize the use of chlorine while maintaining adequate bacterial control.

g. The results of sampling for any parameter done in accordance with EPA approved methods above its required frequency must also be reported.

h. If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions.

i. The dissolved oxygen of the effluent shall not be less than 6 mg/L at any time. The permittee shall report the minimum dissolved oxygen value for each month on the discharge monitoring report.

j. In accordance with 40 C.F.R. § 122.44(i)(1)(iv), the Permittee shall use 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 limited in this permit (except WET limits). A method is considered "sufficiently sensitive" when either (*1*) The method minimum level (ML) is at or below the level of the effluent limit established in this 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 ML is not the minimum level of detection, but rather the lowest level at which the test equipment produces a recognizable signal and acceptable calibration point for a pollutant or pollutant parameter, representative of the lowest concentration at which a pollutant or pollutant parameter can be measured with a known level of confidence. For the purposes of this permit, the detection limit is the lowest concentration that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method during routine laboratory operating conditions (i.e., the level above which an actual value is reported for an analyte, and the level below which an analyte is reported as non-detect).

2. All POTWs must provide adequate notice to the Director of the following:

   a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and

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

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

      (1) The quantity and quality of effluent introduced into the POTW; and

      (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

3. Prohibitions Concerning Interference and Pass Through:

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

4. Toxics Control

   a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.

   b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

5. Numerical Effluent Limitations for Toxicants

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

B. UNAUTHORIZED DISCHARGES

This permit authorizes discharges only from the outfall(s) 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 to EPA and MassDEP in accordance with Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting).

Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes DEP 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 General Requirements of Part II and the following terms and conditions. The permittee is required to complete the following activities for the collection system which it owns:

1. Maintenance Staff

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

2. Preventive Maintenance Program

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

3. Infiltration/Inflow

The permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to control I/I shall be described in the Collection System 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 MassDEP

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

(2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities; and
(3) A schedule for the development and implementation of the full Collection System O&M Plan including the elements in paragraphs b.1. through b.8. below.

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

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;
(2) A preventive maintenance and monitoring program for the collection system;
(3) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;
(4) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;
(5) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
(6) A description of the permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.
(8) An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O&M Plan during the previous calendar year. The report shall be submitted to EPA and MassDEP 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.
f. If treatment plant flow has reached 80% of its design flow (2.4 MGD) based on the annual average flow during the reporting year, 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. ALTERNATIVE 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[1] it owns and operates.

E. PRETREATMENT PROGRAM DEVELOPMENT

Within 180 days of the effective date of the permit, the permittee shall submit a completed pretreatment program to the Director for approval. The proposed pretreatment program must satisfy the requirements of 40 C.F.R. Section 403.8 and the permittee's request for approval must conform to the requirements of 40 C.F.R. Section 403.9.

1. A pretreatment program submitted for approval shall contain the following:

   a. An evaluation by the City Solicitor, or a public official acting in a comparable capacity, of the legal authority of the permittee to apply and enforce the requirements of Sections 307(b), 307(c) and 402(b)(8) of the Clean Water Act. In accordance with 40 C.F.R. Section 403.8(f)(1), this evaluation shall specifically address the permittee's authority to:

      (1) Deny or condition new or increased contributions of pollutants, or changes in the nature of pollutants to the POTW by industrial users;
      (2) Require compliance with applicable pretreatment standards and requirements by industrial users;
      (3) Control, through permit, contract, order, or similar means, the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements;
      (4) Require (A) the development of a compliance schedule by each industrial user for the installation of facilities required to meet applicable pretreatment

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

standards and requirements and (B) the submission of all notices and self-monitoring reports from industrial users as are necessary to assess and assure compliance by industrial users with pretreatment standards and requirements, including but not limited to the reports required in 40 C.F.R. Section 403.12;

(5) Carry out all inspection, surveillance and monitoring procedures necessary to determine, independent of information supplied by industrial users, compliance or noncompliance with applicable pretreatment standards and requirements by industrial users. Representatives of the POTW shall be authorized to enter any premises of any industrial user in which an effluent source or treatment system is located or in which records are required to be kept under 40 C.F.R. Section 403.12(o) to assure compliance with pretreatment standards. Such authority shall be at least as extensive as the authority provided under Section 308 of the Clean Water Act; and

(6) Obtain remedies including injunctive relief (such as discharge termination) and assessment of penalties for non-compliances with any pretreatment standard or requirement or for violation of any of the program requirements set forth in subparagraphs (1) through (5) above.

b. Where the City Solicitor or comparable public official finds that the permittee does not have the authority outlined above, the permittee shall identify what additional authority is needed and submit a plan and schedule for obtaining it by the program submittal date;

2. The pretreatment program submitted for approval shall contain the following:

a. An evaluation of staffing needs and funding to implement its pretreatment program. An estimate of personnel needed to 1) establish and track schedules of compliance, 2) receive and analyze monitoring reports, 3) conduct independent sampling and analysis as necessary, 4) investigate instances of non-compliance, 5) take enforcement actions, and 6) comply with the public participation requirement of 40 C.F.R. Section 403.8(f)(2)(vii), shall be included. The discussion of funding shall include a description of the sources of funding and an estimate of the program costs;

b. A discussion of its pretreatment strategy for all of the industries identified. The permittee shall identify the manner in which it will implement the program requirements set forth in 40 C.F.R. Section 403.8, including the means by which pretreatment standards will be applied to individual users (e.g., by Order, Permit, Ordinance, Contract, etc.). This discussion shall include an enforcement response plan to assure industry compliance with local pretreatment requirements, federal prohibited discharge standards, federal categorical pretreatment standards, and the industrial reporting requirements of 40 C.F.R. Sections 403.12(b)-(e);

c. The design of a monitoring program which will implement the requirements of 40 C.F.R. Sections 403.8 and 403.12, and in particular those requirements referenced in 40 C.F.R. Sections 403.8(f)(1)(iv-v), 403.8(f)(2)(iv-vi), and 403.12(h-j)(l)-(n);

d. A list of additional monitoring equipment required by the POTW to implement the pretreatment program and, a description of municipal facilities to be constructed, if any, for monitoring or analysis of industrial wastes; and

e. Specific POTW effluent limitations (local limits) for pollutants introduced into the POTW by industrial users which may pass through the POTW of interfere with the operation of performance of the works as required by 40 C.F.R. Section 403.5(c) and 403.8(f)(4).

3. The permittee's complete pretreatment program is subject to revisions by EPA during the term of this permit and prior to renewing this permit under Section 301(h) of the Clean Water Act.

F. INDUSTRIAL USERS AND PRETREATMENT PROGRAM

This section (F) will become effective upon EPA approval of the pretreatment program.

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

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

a. Carry out inspection, surveillance, and monitoring procedures which will determine independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum,

all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.

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

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

d. Maintain an adequate revenue structure for continued implementation of the pretreatment program.

3. The permittee shall provide the EPA and MassDEP with an annual report describing the permittee's pretreatment program activities for the twelve (12) month period ending 60 days prior to the due date in accordance with 403.12(i). The annual report shall be consistent with the format described in **Attachment D** (NPDES Permit Requirement for Industrial Pretreatment Annual Report) of this permit and shall be submitted no later than **March 1** of each year.

4. The permittee must obtain approval from EPA prior to making any significant changes to the Industrial Pretreatment Program in accordance with 40 CFR 403.18(c).

5. The permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 CFR 405 et. seq.

6. The permittee must modify its pretreatment program, if necessary, to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the Industrial Pretreatment Program. The permittee must provide EPA, in writing, within 180 days of this permit's effective date proposed changes, if applicable, to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the permittee must address in its written submission the following areas: (1) Enforcement response plan; (2) revised sewer use ordinances; and (3) slug control evaluations. The permittee will implement these proposed changes pending EPA Region I's approval under 40 CFR 403.18. This submission is separate and distinct from any local limits analysis submission described in Part I.E.1.

G. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR Part 503, which prescribe “Standards for the Use or Disposal of Sewage Sludge” pursuant to Section 405(d) of the CWA, 33 U.S.C. § 1345(d).

2. If both state and federal requirements apply to the permittee's sludge use and/or disposal practices, the permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge use or disposal practices.

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

4. The requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g., lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.

5. The 40 CFR. Part 503 requirements including the following elements:

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

   Which of the 40 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.[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.

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

[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

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

7. Under 40 CFR § 503.9(r), the permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the permittee contracts with *another* "person who prepares sewage sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR § 503.9(r), for use or disposal, then the permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR § 503.7. If the ultimate use or disposal method is land application, the permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.

8. The permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by **February 19** (*see also* "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted electronically using EPA's Electronic Reporting tool ("NeT") (see "Monitoring and Reporting" section below).

H. SPECIAL CONDITIONS

1. Aluminum

The Permittee shall have up to three (3) years to comply with the new effluent limit for total aluminum. For the period starting on the effective date of this permit and ending three (3) years after the effective date, the permittee is required to meet the previous permit limit of 278 µg/L. After this initial three (3) year period, the permittee shall comply with the monthly average total aluminum limit of 87 µg/L. 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 permit limit for aluminum.

Reopener Clause for Total Aluminum Effluent Limit

If, within three (3) years of the effective date of the permit, MassDEP has promulgated new statewide water quality criteria for aluminum or the permittee has submitted to MassDEP site-specific study data to support calculation of a site specific aluminum criteria for the location of discharge and potentially affected waters downstream of the discharge, the Permittee may request a Permit Modification to extend the compliance period for attaining the effluent limit for total aluminum beyond the original three (3) year period

2. Bis (2-Ethylhexyl) Phthalate

Within one year of the effective date of the permit, the permittee shall complete an evaluation of alternative methods of operating the existing wastewater treatment plant to

maximize the removal of bis (2-ethylhexyl) phthalate, and submit a report to EPA and MassDEP documenting this evaluation and presenting a description of recommended operational changes. The methods to be evaluated include, but are not limited to, identifying and mitigating sources of bis (2-ethylhexyl) phthalate, developing technically-based maximum allowable headworks loadings, maximum allowable industrial loadings and local limits for bis (2-ethylhexyl) phthalate, operational changes designed to optimize bis (2-ethylhexyl) phthalate treatment, septage receiving policies and procedures, and side stream management. The permittee shall implement the recommended operational changes in order to eliminate its bis (2-ethylhexyl) phthalate discharge from the wastewater treatment plant. Following the submittal of the first report, the permittee shall submit an annual report to EPA and MassDEP, by February 1 each year, that summarizes activities related to optimizing bis (2-ethylhexyl) phthalate removal efficiencies, documents the annual bis (2-ethylhexyl) phthalate discharge concentrations from the wastewater treatment facility, and tracks trends relative to the previous year.

I. 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. Permittees shall continue to send hard copies of reports other than DMRs to the State until further notice from the State. *See* Part I.H.7. 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 Industrial User and Pretreatment Related Reports

   a. Prior to 21 December 2020, all reports and information required of the Permittee in the Industrial Users and Pretreatment Program section of this permit shall be submitted to the Office of Ecosystem Protection's Pretreatment Coordinator in Region 1 EPA's Office of Ecosystem Protection (OEP). Starting on 21 December 2020, these submittals must be

done electronically as NetDMR attachments and/or using EPA's NPDES Electronic Reporting Tool ("NeT") found on the internet at https://www.epa.gov/compliance/npdes-ereporting. These requests, reports and notices include:

(1) Annual Pretreatment Reports,
(2) Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,
(3) Revisions to Industrial Discharge Limits,
(4) Report describing Pretreatment Program activities, and
(5) Proposed changes to a Pretreatment Program

b. This information shall be submitted to EPA/OEP as a hard copy at the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

4. 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.

5. 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) Report on unacceptable dilution water / request for alternative dilution water for WET testing.
(4) Report of new industrial user commencing discharge
(5) 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

6. 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

   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

7. State Reporting

   a. Unless otherwise specified in this permit or by the State, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.H.3 through I.H.5 shall also be submitted to the Massachusetts Department of Environmental Protection (MassDEP) at the following address:

MassDEP – Central Region
Bureau of Resource Protection
8 New Bond Street
Worcester, Massachusetts 01606

   b. For MA only: Copies of WET test reports and nitrogen optimization reports ONLY shall be submitted to:

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

8. 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's Office of Environmental Stewardship at:

617-918-1510

J. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 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 U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

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

EPA - New England

Reassessment of Technically Based Industrial Discharge Limits

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

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

Please read direction below before filling out form.

ITEM I.

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

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

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

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

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

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

ITEM II.

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

ITEM III.

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

ITEM IV.

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

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

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

ITEM V.

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

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

* Based on your existing TBLLs, as presented in Item II., list in Column (2), for each pollutant the Maximum Allowable Headwork Loading (MAHL) values derived from an applicable environmental criteria or standard, e.g. water quality, sludge, NPDES, inhibition, etc. For more information, please see EPA's Local Limit Guidance Document (July 2004).

Item VI.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in micrograms per liter) present your POTW's effluent. Current sampling data is defined as data obtained during the last 24 month period.

(Item VI. continued)

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

* List in Column (2A) what the Water Quality Standards (WQS) were (in micrograms per liter) when your TBLLs were calculated, please note what hardness value was used at that time. Hardness should be expressed in milligram per liter of Calcium Carbonate.

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

ITEM VII.

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

ITEM VIII.

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

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

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

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

REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS (TBLLs)

POTW Name & Address : _____

NPDES PERMIT # : _____

Date EPA approved current TBLLs : _____

Date EPA approved current Sewer Use Ordinance : _____

ITEM I.

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

ITEM II.

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

ITEM III.

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

ITEM IV.

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

_____

_____

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

If yes, explain.

_____

_____

ITEM V.

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

ITEM VI.

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

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

*Hardness Dependent (mg/l - $CaCO_3$)

ITEM VII.

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

ITEM VIII.

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

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

NPDES PERMIT REQUIREMENT
FOR
INDUSTRIAL PRETREATMENT ANNUAL REPORT

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NPDES PART II STANDARD CONDITIONS
(January, 2007)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

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

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

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

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

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

2. Permit Actions

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

3. Duty to Provide Information

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

4. Reopener Clause

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

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

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

5. Oil and Hazardous Substance Liability

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

6. Property Rights

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

7. Confidentiality of Information

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

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

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

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

8. Duty to Reapply

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

9. State Authorities

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

10. Other Laws

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

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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

b. Bypass not exceeding limitations

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

c. Notice

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

d. Prohibition of bypass

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

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

5. Upset

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

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

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

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

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

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

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

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

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

c. Records of monitoring information shall include:

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

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

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

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

2. Inspection and Entry

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

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

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

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

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

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

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

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

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

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

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

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

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

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

e. Twenty-four hour reporting.

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

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

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

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

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

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

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

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

2. Signatory Requirement

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

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

3. Availability of Reports.

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

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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

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

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

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

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

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

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

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

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

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

Construction Activities - The following definitions apply to construction activities:

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

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

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

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

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

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

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

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

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

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

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

Discharge of a pollutant means:

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

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

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

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

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

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

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

EPA means the United States "Environmental Protection Agency".

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NPDES means "National Pollutant Discharge Elimination System".

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

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

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

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

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

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

(a) Sewage from vessels; or

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Waters of the United States means:

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

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

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

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

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

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

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

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

(f) The territorial sea; and

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Range land is open land with indigenous vegetation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Commonly Used Abbreviations

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

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

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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND
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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 NO.: **MA0101788**

PUBLIC NOTICE START AND END DATES: April 11, 2018 – May 10, 2018

NAME AND ADDRESS OF APPLICANT:

Town of Hudson
Department of Public Works
One Municipal Drive
Hudson, MA 01749

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Hudson Wastewater Treatment Facility
One Municipal Drive
Hudson, MA 01749

RECEIVING WATER: **Assabet River, (MA82B-05)**

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

Contents

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

The Town of Hudson has requested that the U.S. Environmental Protection Agency (EPA) reissue its NPDES permit to discharge into the Assabet River. Hudson Wastewater Treatment Plant (WWTP) is engaged in the collection and treatment of municipal wastewater.

The existing NPDES (Current Permit) permit was issued on May 26, 2005, became effective on July 25, 2005 and expired on July 25, 2010. The applicant filed a complete application as required by 40 Code of Federal Regulations (CFR) § 122.6, so the Current Permit has been administratively continued and will remain in effect until a renewed permit has been issued. The Current Permit and Draft Permit authorize only one discharge, from Outfall 001 at the facility. The Draft Permit has been written to reflect current operations and conditions at the facility.

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

Attachment A of the fact sheet is a site locus map of the facility. A quantitative description of the treatment plant's discharge in terms of significant effluent parameters based on recent monitoring data is attached to the fact sheet as **Attachment B**, Hudson Wastewater Treatment Facility - Discharge Monitoring Report (DMR) Data. The data in **Attachment C**, Whole Effluent Toxicity Test Chemistry Data was used to calculate the Draft Permit's proposed water quality-based effluent limits for metals. **Attachment D**, Statistical Approach for Effluent Data (N>10), was used to calculate the Draft Permit's proposed water quality-based effluent limits for metals and ammonia. **Attachment E** of the fact sheet is a diagram of the facility's flow process. **Attachment F** is a Summary of Merrimack River Estuary Data, for 2017. **Table 1** is the acute and chronic criteria for metals. **Table 2** is the reasonable potential analysis for cadmium, lead, nickel, and zinc. The analysis of ammonia limits in the current permit are in **Table 3.**

III. Limitations and Conditions

The proposed effluent limitations and monitoring requirements may be found in the Draft Permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation

The Town of Hudson operates a 3 million-gallon per day (MGD) advanced wastewater treatment facility located in Hudson, Massachusetts that serves approximately 15,000 people from the Town of Hudson. The entire collection system is composed of 100 percent separate sanitary sewers. The facility accepts up to 400,000 gallons per year of septage from residential septic systems in Hudson. The septage is discharged from septic waste tanks to the headworks of the facility.

As shown in **Attachment E,** wastewater enters the treatment plant through the headworks, where large debris is screened out by a mechanical bar screen, sand and grit are settled out in aerated grit chambers, and a mechanical fine screen screens out small debris and solids. Wastewater then flows to the primary clarifiers. Sodium hydroxide is added at the tail end of primary settling to increase pH in the wastewater. Biological treatment follows, as the wastewater first flows through trickling filters, followed by second clarifiers. Ferric chloride is added as wastewater flows between these process units. The flow goes into a mechanical aeration tank equipped with variable speed drives. Afterwards, the flow enters two activated sludge clarifiers. Ferric chloride and sodium hypochlorite are added to the final clarifier effluent. The flow then enters two Dissolved Air Flotation (DAF) units, where suspended matter precipitates out of the flow. The remaining solids are stored in sludge storage tanks along with the solids from the primary and final clarifiers. The wastewater then enters a chlorine contact tank. Sodium bisulfate is added prior to discharge. Final effluent discharges into the Assabet River.

A. Overview of Federal and State Regulations General Requirements

The Clean Water Act (CWA or the Act) prohibits the discharge of pollutants to waters of the United States without an NPDES permit unless such a discharge is otherwise authorized by the Act. NPDES permits are used to implement technology-based and water quality-based effluent limitations as well as other requirements, including monitoring and reporting. This Draft NPDES Permit was developed in accordance with statutory and regulatory authorities established pursuant to the Act. The regulations governing the NPDES program are primarily found in 40 CFR Parts 122, 124, and 125.

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Act. Under Section 301(b)(1)(B) of the CWA, publicly owned treatment works (POTWs) must have achieved effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth at 40 CFR Part 133.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to limits more stringent than technology-based limits where necessary to meet water quality standards. These are known as water quality-based effluent limits. The Massachusetts Surface Water Quality Standards (MA SWQS) include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, be used unless a site-specific criterion is established. MA SWQS (314 CMR 4.00) require that discharges of pollutants to surface waters be limited or prohibited to assure that surface water quality standards of the receiving waters are protected and maintained or attained. See 314 CMR 4.03(1)(a).

EPA regulations at 40 CFR 122.44(d)(1)(i), require that the permit limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion. An excursion occurs if the projected or actual in-stream concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and, where appropriate, the dilution of the effluent in the receiving water.

EPA's anti-backsliding provisions, found in Sections 402(o) and 303(d)(4) of the CWA and at 40 CFR 122.44(l), prohibit the relaxation of permit limits, standards, and conditions, except under certain, limited conditions. Anti-backsliding provisions apply to effluent limits based on technology, water quality, Best Professional Judgement and State Certification requirements. A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the Current Permit unless in compliance with the anti-backsliding requirement of the CWA. The Draft Permit for Hudson WWTP does not propose any permit requirements that are less stringent that those contained in the Current Permit.

B. Waterbody Classification and Usage

The facility discharges to segment (MA82B-05) of the Assabet River.[1] The Massachusetts Department of Environmental Protection (MassDEP) lists this segment of the river as a Class B warm water fishery.

Class B water
These waters are designated as habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. Where designated in 314 CMR 4.06, they shall be suitable as a source of public water supply with appropriate treatment ("Treated Water Supply"). Class B waters shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.[2]"

A warm water fishery is defined in the MA SWQS (314 CMR 4.02) as, *"Water in which the maximum mean monthly temperature generally exceeds 68 ^{0} F (20 ^{0} C) during the summer months and are not capable of sustaining a year-round population of cold water stenothermal aquatic life.[3]*

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

1) Unimpaired and not threatened for all designated uses; 2) Unimpaired waters for some uses and not assessed for others; 3) Insufficient information to make assessments for any uses; 4) Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) Impaired or threatened for one or more uses and requiring a TMDL. Section 303(d) of the CWA requires states to identify and list those water bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such, require the development of Total Maximum Daily Load.

The MassDEP combines the requirements in Sections 305(b) and 303(d) of the CWA into one report and it is available on the MassDEP website at http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf as the "*Final Massachusetts Year 2014 Integrated Lists of Water"* (2014 Integrated List).

Segment MA82B-05 of the Assabet River is listed as not in attainment of state water quality standards; the river is impaired for macrophytes, excess algal growth, fecal coliform, nutrients, dissolved oxygen, and total phosphorus.[4] It requires a TMDL for pathogens. The limits and conditions in the Draft Permit should be sufficient to ensure that this discharge will not cause or contribute to non-attainment for pathogens.

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[1] *SuAsCo Water Quality Assessment Report, Assabet Subwatershed*. (2001). Massachusetts Department of Environmental Protection. pg. 85
[2] Massachusetts Surface Water Quality Standards, 314 CMR 4.05(3)(b)
[3] Massachusetts Surface Water Quality Standards, 314 CMR 4.02
[4] *SuAsCo Water Quality Assessment Report, Assabet Subwatershed*. (2001). Massachusetts Department of Environmental Protection. pg. 85

C. River Flow and Available Dilution

1. 7Q10

Water quality-based effluent limits in the Draft Permit are derived using water quality criteria and available dilution during the 7Q10 low flow period. A 7Q10 low flow period is defined as the lowest mean stream flow for seven consecutive days with a ten-year recurrence interval. For rivers and streams, Massachusetts regulations at 314 CMR 4.03(3)(a) require that the 7Q10 low flow be used to represent the critical hydrologic conditions at which the in-stream water quality criteria must be met. The 7Q10 low flow at the discharge, the facility's design flow, and river flow upstream of the discharge are used to calculate a dilution factor.

To calculate the 7Q10 at the outfall, the month during which the Assabet River had its lowest flow was identified first; the river had its lowest flow in July 2016. Second, all dischargers upstream of USGS Maynard gage #01097000 and each discharger's average effluent flow during July 2016 were identified. Third, the average effluent flows from facilities upstream of the Maynard gage were subtracted from the flow at the Maynard gage. The difference between the flow at the Maynard gage and the combined effluent flows upstream of the Maynard gage is the Assabet River's base flow at the Maynard gage. Fourth, the base flow was divided by its drainage area to obtain a flow factor. Fifth, the flow factor was multiplied by the treatment plant's drainage area to obtain the 7Q10 due to base flow at the plant's effluent. Finally, the 7Q10 due to base flow at the plant's effluent was added to the average effluent flows from the facilities upstream of the Maynard gage during July 2016. The sum of the two values approximates river flow upstream of the discharge during dry conditions.

a) Calculation

$$Q_{USGS\ Gage} - \sum Q_{Upstream\ Facilities} = Base\ Flow_{Maynard\ gage}$$

$$\frac{Base\ Flow_{Maynard\ gage}}{Area_{Gage}} = Flow\ Factor$$

$$(Flow\ Factor)\left(Drainage\ Area_{Effluent}\right) = Base\ Flow_{Effluent}$$

$$Base\ Flow_{Effluent} + \sum Q_{Upstream\ Facilities} = 7Q10_{Effluent}$$

Where:

- $\boldsymbol{Q_{USGS\ Gage}} = Flow\ at\ USGS\ Gage = 12.667\ cfs$ (calculated using USGS Surface Water Toolbox to model streamflow data from 4/1/1986 to 3/30/2016 at USGS gage #1097000)

- $\sum \boldsymbol{Q_{Upstream\ Facilities}} = Effluent\ Flow\ from\ upstream\ dischargers = 11.04\ cfs$ In addition to Hudson's average discharge of 0.99 cfs in July 2016, upstream dischargers include Marlborough West wastewater treatment plant (discharging an average of 2.17 cfs during July 2016) and Westborough wastewater treatment plant (discharging an average of 7.88 cfs during July 2016). Lowest flow in Assabet River from 4/1/1986 to 3/30/2016 = 14.68 cfs on 7/1/2016. Therefore, average discharges from upstream facilities were analyzed using data from July 2016).

- $\boldsymbol{Area_{USGS\ Gage}} = Drainage\ area\ of\ Assabet\ River\ at\ Maynard\ gage = 109\ mi^2$ (USGS)

- $\boldsymbol{Drainage\ Area_{Effluent}} = Drainage\ area\ at\ Hudson\ WWTP = 67\ mi^2$

Evaluation & Result:

$$Base\ Flow_{Maynard\ gage} = 12.667\ cfs - 11.04\ cfs = 1.627\ cfs$$

$$Flow\ Factor = \frac{1.627\ cfs}{109\ mi^2} = 0.0149\ \frac{cfs}{mi^2}$$

$$Base\ Flow_{Effluent} = \left(0.0149\ \frac{cfs}{mi^2}\right)(67 mi^2) = 1\ cfs$$

$$7Q10_{Effluent} = 1\ cfs + 11.04\ cfs = 12.04\ cfs \rightarrow \boldsymbol{12\ cfs}$$

The proposed 7Q10, **12 cfs**, is slightly lower than the 7Q10 used in the Current Permit (14 cfs). The basis for this recalculation is more recent streamflow data, recorded from 1986 through 2016, at the Maynard USGS gage station (#1097000).

2. Available Dilution

Allowable discharge concentrations depend on water quality criteria and available dilution. Available dilution is represented in a NPDES context by a dilution factor. A dilution factor is the ratio between the low flow (7Q10) in the receiving water immediately upstream of a permittee's discharge point and the permittee's design flow. Allowable discharge concentrations based on water quality criteria are multiplied by the dilution factor to determine effluent limits. Thus, effluent limits are specifically tailored to each permittee and waterbody.

a) Calculation

$$\frac{7Q10_{Effluent} + Q_{Effluent}}{Q_{Effluent}} = Dilution\ Factor$$

Where:

- $\boldsymbol{7Q10_{Effluent}} = Low\ Flow = 12\ cfs$ (from previous calculation, see Section IV.C.1.a)
- $\boldsymbol{Q_{Effluent}} = Effluent\ Flow = 3\ MGD$ (from permit application)

Evaluation & Result:

$$Dilution\ Factor = \frac{(12\ cfs + \left(\frac{3\ MGD}{0.646\ \frac{MGD}{cfs}}\right))}{\left(\frac{3\ MGD}{0.646\ \frac{MGD}{cfs}}\right)} = \frac{(12\ cfs + 5\ cfs)}{5\ cfs} = \boldsymbol{3.4}$$

As shown above, Hudson WWTP has a dilution factor of **3.4** for a design flow of 3 MGD and a 7Q10 of 12.

D. Permit Limits and Effluent Data

1. Conventional Pollutants

a) Wastewater Effluent Flow

The annual average wastewater effluent flow limit in the Draft Permit is the same as in the Current Permit, **3 MGD (4.64 cfs)**. Monthly average flows for the period from December 2011 through October 2016 were from 1.34 MGD to 2.22 MGD. For the period from December 2011 through October 2016, the rolling annual average flow from the facility was consistently below the design flow of the facility, as shown in Attachment B, Hudson Wastewater Treatment Plant-Discharge Monitoring Report Data. A review of monthly average and daily maximum wastewater effluent flow data submitted with the monthly discharge monitoring report show periodic yet significant increases in effluent discharged to the river which do not appear to occur on sampling days. The permittee had a maximum flow of 4.59 MGD in March 2014, a minimum flow of 0.99 MGD in July and September 2016, and an average flow of 1.64 MGD from December 2011 to October 2016.

b) BOD & TSS

The concentration (mg/L) and mass-based (lbs/day) limits for BOD_5 and TSS proposed in the Draft Permit are the same as the limits in the Current Permit. They are based on a 1989 wasteload allocation completed by MassDEP[5] developed to address odors due to decaying plant matter[6] and are more stringent than technology-based secondary treatment requirements found at 40 CFR Part 133.

For both BOD_5 and TSS, the monthly average limits are **663 lbs/day** and **30 mg/L**, from November through March. The weekly average limits from November through March are **995 lbs/day** and **45 mg/L**. For April through October, the monthly average limits BOD_5 and TSS limits are **332 lbs/day** and **15 mg/L**. The weekly average limits from April through October are **442 lbs/day** and **20 mg/L**.

The maximum daily reporting requirements for BOD_5 and TSS are proposed to be continued from the Current Permit to the Draft Permit.

The Draft Permit also contains 85% BOD_5 and 85% TSS removal limitations based on the requirements of 40 CFR §§ 133.102(3). These limitations are the same as in the Current Permit. A review of DMR data from December 2011 through October 2016 demonstrates the facility has been in compliance with the 85% BOD_5 and TSS removal limits. See Attachment B, Hudson Wastewater Treatment Plant - Discharge Monitoring Report Data of the fact sheet for recent DMR data.

According to the DMR, there were no monthly average or weekly average BOD_5 exceedances between December 2011 and October 2016. Effluent BOD concentrations ranged between 0 mg/L and 20 mg/L. The monthly average effluent BOD concentrations were 2.6 mg/L and 2.89 mg/L during the summer and winter, respectively.

There were no monthly average TSS exceedances between December 2011 and October 2016. There was one weekly average TSS exceedance between December 2011 and October 2016. Effluent TSS concentrations ranged between 0 mg/L and 42 mg/L. The monthly average effluent TSS concentrations were 2.38 mg/L and 2.75 mg/L during the summer and winter, respectively. See Attachment B – Summary of DMR Data.

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[5] *1989 Assabet River Water Quality Management Plan*. Massachusetts Department of Environmental Quality Engineering. pg. 41
[6] *1989 Assabet River Water Quality Management Plan.* Massachusetts Department of Environmental Quality Engineering, pg. 18

c) pH

The MA SWQS require Class B waters maintain a pH range **of 6.5 through 8.3 standard units** with not more than 0.5 standard units outside of the receiving water background range. The water quality standards also require there be no change from background conditions that would impair any use assigned to this class. Consistent with the MA SWQS, the Current Permit proposes that effluent pH be within the same range.

According to the DMR summary in Attachment B, the facility did not meet its pH limits three times between December 2011 and October 2016. Effluent pH ranged between 3.9 and 8.8 standard units. The average pH reported from the facility was 7.23 standard units.

The Draft Permit proposes continuing the pH limits from the Current Permit because there has been no change in MA SWQS concerning pH, and the facility has typically been able to meet its permit limits.

d) Dissolved Oxygen (DO)

The DO limit, 6.0 mg/L, in the Current Permit is based on a 1989 MassDEP waste load allocation (WLA) analysis[7] developed to address dissolved oxygen deficits in the Assabet River from 1965 to 1988.[8] Dissolved oxygen continues to be a listed impairment for this segment of the Assabet River in the "*Final Massachusetts Year 2014 Integrated Lists of Water"* (2014 Integrated List).

According to the DMR, there were no DO violations reported from December 2011 through October 2016. Effluent DO ranged between 6.5 mg/L and 9.1 mg/L. The average effluent DO concentration was 7.53 mg/L from December 2011 to October 2016. See Attachment B – Summary of DMR Data.

Since there have been no changes in DO MA SWQS since promulgation of the Current Permit, the DO effluent limit in the Current Permit is proposed to be carried over to the Draft Permit, "not less than **6.0 mg/L**."

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

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

According to the DMR, there were three exceedances of the maximum daily fecal coliform limit between December 2011 and October 2016. The fecal coliform count in the effluent ranged between 0 per 100 mL and 1121 per 100 mL. The average fecal coliform count was 10 per 100 mL. See Attachment B – Summary of DMR Data.

The *E. coli* bacteria limitations proposed in the Draft Permit are a monthly average geometric mean of **126 cfu/100 mL** and a maximum daily value of **409 cfu/100 mL**. The maximum daily value is the 90% distribution of the geometric mean of 126 cfu/100 mL. The monitoring frequency is two times per week.

[7] *1989 Assabet River Water Quality Management Plan.* Massachusetts Department of Environmental Quality Engineering, pg. 41
[8] *1989 Assabet River Water Quality Management Plan.* Massachusetts Department of Environmental Quality Engineering, pg. 18

2. Non-conventional Pollutants

a) Total Residual Chlorine (TRC)

Chlorine and chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. Thus, EPA developed chlorine limits using the chronic and acute criteria defined in the National Recommended Water Quality Criteria: 2002, as adopted by the MassDEP into the MA SWQS. The criteria states that the average TRC in a receiving water should not exceed 11 µg/L for chronic toxicity protection and 19 µg/L for acute toxicity protection.

TRC effluent limits in the Current Permit are **35 µg/L (monthly average) and 61 µg/L (daily maximum)**. According the DMR summary, the permittee did not meet these limits twice between December 2011 to October 2016. Effluent TRC averaged 10 µg/L. See Attachment B – Summary of DMR Data.

To determine if the effluent limits from the Current Permit continue to be protective, and assuming a negligible upstream load of TRC, the acute and chronic criteria (19 µg/L and 11 µg/L, respectively) were divided by the available receiving water dilution factor (3.4) and compared to the water quality criteria to determine if the monthly average effluent limit in the current permit would exceed the chronic criteria or the maximum daily effluent limit would exceed the acute criteria as follows:

35 µg/L ÷ 3.4 = 10 µg/L, which is less than 11 µg/L and

61 µg/L ÷ 3.4 = 18 µg/L, which is less than 19 µg/L.

Therefore, the TRC effluent limits from the Current Permit and the twice daily monitoring requirement have been carried forward into the Draft Permit.

b) Bis (2-Ethylhexyl) Phthalate

Bis (2-ethylhexyl) phthalate was present in detectable quantities in the four effluent samples analyzed in for priority pollutants as required for the NPDES permit reissuance. Bis (2-ethylhexyl) phthalate is a semi-volatile organic compound commonly used as a plasticizer in the production of PVC.[9] Bis (2-ethylhexyl) phthalate is toxic for human consumption, through direct consumption of water or due to its ability to bioaccumulate in aquatic organisms, which are then consumed by humans.

Bis (2-ethylhexyl) phthalate is not listed specifically in the Massachusetts Surface Water Quality Standards (314 CMR 4.00). Therefore, according to the Massachusetts Surface Water Quality Standards [314 CMR 4.05(5)(e)]:

> For pollutants not otherwise listed in 314 CMR 4.00, the National Recommended Water Quality Criteria: 2002, EPA 822R-02-047, November 2002 published by EPA pursuant to Section 304(a) of the Federal Water Pollution Control Act, are the allowable receiving water concentrations for the affected waters, unless the Department either establishes a site-specific criterion or determines that naturally occurring background concentrations are higher.

The National Recommended Water Quality Criteria include human health criteria of 1.2 µg/L (water and organism) and of 2.2 µg/L (organism only) for bis (2-ethylhexyl) phthalate. The water quality

[9] *EPA National Recommended Water Quality Criteria: 2002,* pg. 5 & 10

criteria for bis (2-ethylhexyl) phthalate based on human health depends on the receiving water's use.

To determine whether Hudson's bis (2-ethylhexyl) phthalate discharge has reasonable potential to impair the Assabet River, the concentration of bis (2-ethylhexyl) phthalate immediately downstream of the effluent during critical conditions was estimated and compared to the applicable water quality criteria of 1.2 µg/L. If the concentration of bis (2-ethylhexyl) phthalate immediately downstream of the effluent is greater than 1.2 µg/L, then Hudson has reasonable potential to impair the Assabet River via its effluent. The concentration of bis (2-ethylhexyl) phthalate immediately downstream of the effluent was modeled via the following mass-balance equation:

(1) Reasonable Potential Analysis

$$Q_e C_e + Q_s C_s = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_e C_e + Q_s C_s}{Q_r}$$

Where:

- $\boldsymbol{Q_e} = Effluent\ flow = 3\ MGD = 4.64\ cfs$ (design flow)
- $\boldsymbol{C_e} = Effluent\ bis\ (2-ethylhexyl)\ phthalate\ concentration = 21\ \mu g/L$ (monthly average from permit application)
- $\boldsymbol{Q_s} = Low\ flow\ in\ Assabet\ river = 7Q10_{Effluent} = 12\ cfs$ (from previous calculation, see Section IV.C.1.a)
- $\boldsymbol{C_s} = In-stream\ bis\ (2-ethylhexyl)\ phthalate\ concentration = 0\ \frac{\mu g}{L}$ (assumed maximum assimilative capacity)
- $\boldsymbol{Q_r} = Flow\ immediately\ downstream\ of\ effluent = Q_e + Q_s = 16.64\ cfs$
- $\boldsymbol{C_r} = Concentration\ immediately\ downstream\ of\ effluent$

Evaluation & Result:

$$C_r = \frac{(4.64\ cfs)\left(21\frac{\mu g}{L}\right) + (12\ cfs)(0\frac{\mu g}{L})}{16.64\ cfs} = \frac{97}{16.64} = 5.8\frac{\mu g}{L}$$

$$5.8\frac{\mu g}{L} > 1.2\frac{\mu g}{L}\ (applicable\ water\ quality\ criteria)$$

Even with maximum assimilative capacity, Hudson's effluent would raise the concentration of bis (2-ethylhexyl) phthalate in the Assabet River from 0 µg/L to 5.8 µg/L. A bis (2-ethylhexyl) phthalate concentration of 5.8 µg/L exceeds the applicable water quality criteria of 1.2 µg/L (human health criteria for consumption of organisms).

Thus, the above calculations indicate that there is reasonable potential for the discharge to cause an exceedance of the Massachusetts bis (2-ethylhexyl) phthalate criteria in the Assabet River. As a result, EPA has established a water quality-based effluent limit for of bis (2-ethylhexyl) phthalate in the draft permit. In this case, EPA had opted to include this water quality-based effluent limit in the form of narrative limitations rather that a numeric limitation. The primary reason for EPA's use of its discretion to use narrative limitations in this case is the likelihood that a limited number of industrial sources represent the majority of the source of the facility's effluent bis (2-ethylhexyl) phthalate. Further, it is likely that this source or sources can be identified and that measures can be taken to remove bis (2-ethylhexyl) phthalate from the influent wastewater. This can be best accomplished through the

development and implementation of a plan to maximize the removal of bis (2-ethylhexyl) phthalate (as described in part I.H.2 of the Draft Permit), and the development of an industrial pre-treatment program. In addition, the Draft Permit requires monthly effluent monitoring of bis (2-ethylhexyl) phthalate to monitor the effectiveness of these measures in reducing bis (2-ethylhexyl) phthalate in the facility's discharge.

c) Metals

Certain metals in water can be particularly toxic to aquatic life. The CWA limits toxic metal concentrations in the effluent where aquatic life may be impacted. Concentrations of metals in effluent samples measured for the facility's Whole Effluent Toxicity (WET) testing and reported between June 2013 and September 2016 were used to evaluate reasonable potential for acute or chronic toxicity caused by cadmium, lead, nickel, and zinc. For all metals, receiving water data collected during WET sampling was used to characterize the upstream hardness and metals concentrations. Since the Current Permit already has effluent limits for aluminum and copper, recent effluent data was used along with the hardness data for effluent from the WET tests to evaluate whether these effluent limits continue to be protective for aluminum and copper.

(1) Criteria for Metals

Metals may be present in both dissolved and particulate forms in the water column. Extensive studies suggest that it is the dissolved fraction that is biologically available and therefore, presents the greatest risk of toxicity to aquatic life inhabiting the water column. This conclusion is widely accepted by the scientific community both within and outside of EPA.[10] As a result, water quality criteria are established in terms of dissolved metals.

However, many inorganic components of domestic wastewater, including metals, are in the particulate form, and differences in the chemical composition between the effluent and the receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form.[11] Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Regulations at 40 CFR §122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals.

The Massachusetts Surface Water Quality Standards were revised in December 2006, and approved by EPA on March 26, 2007, to include a site-specific dissolved acute copper criterion of 25.7 µg/L and a dissolved chronic copper criterion of 18.1 µg/L for the Assabet River (314 CMR § 4.06, Table 28 (Site Specific Criteria)). These dissolved copper criteria can be divided by the conversion factor of 0.960[12] to express the criteria as total recoverable copper for the purposes of evaluating whether the effluent limit for copper in the Current Permit is adequate to prevent a violation of the criteria. Therefore, the total recoverable copper acute and chronic criteria are 26.8 µg/L and 18.9 µg/L, respectively, as summarized in Table 1.

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[10] *Water Quality Standards Handbook: Second Edition*, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-005a]. Also see https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter3.pdf #section6).

[11] *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B-96-007])

[12] *EPA National Recommended Water Quality Criteria: 2002,* Appendix A – Conversions Factors for Dissolved Metals, page 31.

Table 1 – Acute and Chronic 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	-3.924	0.7409	-4.719	1.23	0.181
Copper	—	—	—	—	26.8	18.9
Lead	1.273	-1.460	1.273	-4.705	41	1.6
Nickel	0.8460	2.255	0.8460	0.0584	297	33
Zinc	0.8473	0.884	0.8473	0.884	75.7	75.7

Hardness = 59 mg/L
*Acute Criteria (CMC) = exp{ma*ln(hardness)+ba}
**Chronic Criteria (CCC) = exp{mc*ln(hardness)+bc}

Hardness-based water quality criteria for cadmium, lead, nickel and zinc, the criteria were determined using the equations in *EPA National Recommended Water Quality Criteria: 2002*. EPA's Office of Water - Office of Science and Water Technology stated in a letter dated July 7, 2000 that; "The hardness of water containing the discharged toxic metal should be used for determining the applicable criterion. Thus, the downstream hardness should be used." Hardness is reported as an equivalent concentration of calcium carbonate. Hardness (calcium carbonate) in the Assabet River at Hudson was modeled by a mass balance:

$$Q_e C_e + Q_s C_s = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_e C_e + Q_s C_s}{Q_r}$$

Where:

- $\boldsymbol{Q_e} = Effluent\ flow = 3\ MGD = 4.64\ cfs$ (design flow)
- $\boldsymbol{C_e} = Effluent\ hardness = 62.5\ mg/L$ (average effluent hardness according to WET tests)
- $\boldsymbol{Q_s} = Low\ flow\ in\ Assabet\ river = 7Q10_{Effluent} = 12\ cfs$ (from previous calculation, see Section IV.C.1.a)
- $\boldsymbol{C_s} = In-stream\ hardness = 56.5\frac{mg}{L}$ (average in-stream hardness according to WET tests)
- $\boldsymbol{Q_r} = Flow\ immediately\ downstream\ of\ effluent = Q_e + Q_s = 16.64\ cfs$
- $\boldsymbol{C_r} = Hardness\ immediately\ downstream\ of\ effluent$

$$\frac{(4.64\ cfs)(62.5\ \frac{mg}{L}) + (12\ cfs)(56.5\ \frac{mg}{L})}{16.64\ cfs} = \frac{290 + 678}{16.64} = \mathbf{59}\ \frac{\boldsymbol{mg}}{\boldsymbol{L}} = \boldsymbol{C_r}$$

The downstream hardness was calculated to be 59 mg/L as $CaCO_3$, using a mass balance equation with a design flow of 3 MGD, receiving water 7Q10 of 12 cfs, an upstream median hardness of 56.5 mg/L as

$CaCO_3$, and an effluent median hardness of 62.5 mg/L as $CaCO_3$. The hardness value of 59 mg/L allows the total recoverable criteria to be calculated, both acute and chronic, for cadmium, lead, nickel, and zinc. A summary of the total recoverable criteria for cadmium, lead, nickel, and zinc are provided in Table 1.

(2) Aluminum

The Current Permit includes a monthly average total recoverable aluminum limit of 278 µg/L with a monthly monitoring requirement. Review of the monitoring data in the DMRs from December 2011 to October 2016, provided in Attachment B, shows that the monthly average aluminum in the effluent averaged 60 µg/L (range 0 to 100 µg/L). Since the aluminum criteria are not hardness dependent, the criteria have not changed.

The analysis conducted for the Current Permit indicated there was reasonable potential for aluminum. A mass balance approach was used to model the limit in the Current Permit to determine whether it continues to reasonably prevent the discharge from causing or contributing to a violation of the chronic aluminum criteria of 87 µg/L. The following mass balance equation was used to determine whether the current limit of 278 µg/L is still protective of water quality:

$$Q_e C_e + Q_s C_s = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_e C_e + Q_s C_s}{Q_r}$$

Where:

- $\boldsymbol{Q_e} = Effluent\ flow = 3\ MGD = 4.64\ cfs$ (design flow)
- $\boldsymbol{C_e} = Aluminum\ limit = 278 \frac{\mu g}{L}$ (aluminum limit from Current Permit)
- $\boldsymbol{Q_s} = Low\ flow\ in\ Assabet\ river = 7Q10_{Effluent} = 12\ cfs$ (from previous calculation, see Section IV.C.1.a)
- $\boldsymbol{C_s} = In - stream\ aluminum = 99 \frac{\mu g}{L}$ (median in-stream aluminum concentration according to WET tests)
- $\boldsymbol{Q_r} = Flow\ immediately\ downstream\ of\ effluent = Q_e + Q_s = 16.64\ cfs$
- $\boldsymbol{C_r} = Aluminum\ concentration\ immediately\ downstream\ of\ effluent$

Evaluation & Result:

$$\frac{(4.64\ cfs)(278 \frac{\mu g}{L}) + (12\ cfs)(99 \frac{\mu g}{L})}{16.64\ cfs} = \frac{1290 + 1200}{16.64} = 150 \frac{\mu g}{L} = C_r$$

$$150 \frac{\mu g}{L} > 87 \frac{\mu g}{L}$$

Since the estimated aluminum concentration downstream of the effluent is greater than the applicable water quality criteria of 87 µg/L, the limit in the Current Permit is not protective of chronic SWQS for aluminum. This is because the median upstream ambient aluminum concentration is already greater than the criteria indicating an aluminum impairment in the Assabet River. As a result, the draft permit proposes an aluminum limit equal to the chronic SWQS for aluminum of 87 µg/L.

(3) Total Recoverable Copper (copper)

The Current Permit includes a monthly average copper limit of 17 µg/L and a maximum daily copper limit of 23 µg/L with a monthly sampling frequency. Review of the monitoring data in the DMRs from December 2011 to October 2016, provided in Attachment B, shows that the monthly average copper in the effluent averaged 20 µg/L (range 9 to 46 µg/L).

There were 28 violations of monthly average copper limits and 35 violations of daily maximum copper limits, see Attachment B – Summary of DMR Data. Consistent violations took place until mid-2016. The high copper levels in the effluent were due to high copper levels in Hudson's drinking water supply, from anti-corrosion chemicals used for piping. Hudson began coming in to compliance with its copper limits after the town began receiving its drinking water from the Town of Marlborough in late 2015. While the Town of Hudson was receiving drinking water from the Town of Marlborough, the Town of Hudson reduced copper concentrations in its drinking water supply by adjusting the amount of anti-corrosion chemicals used in pipe protection. The Town of Hudson switched back to its own drinking water supply in early 2016. Additionally, Hudson WWTP's phosphorus treatment has the incidental effect of mitigating copper concentrations because Hudson WWTP's phosphorus removal process raises the pH of the process flow, which aids in copper removal. There have been only two violations of copper limits since October 2016.

The following mass balance equation, solved for the receiving water concentration of copper, C_r, is used to determine if the effluent limits in the current permit are still protective given the new site-specific copper criteria.

$$Q_e C_e + Q_s C_s = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_e C_e + Q_s C_s}{Q_r}$$

Where:

- $\boldsymbol{Q_e} = Effluent\ flow = 3\ MGD = 4.64\ cfs$ (design flow)
- $\boldsymbol{C_e} = Copper\ limit = 23\frac{\mu g}{L}$ (daily maximum copper limit from Current Permit)
- $\boldsymbol{Q_s} = Low\ flow\ in\ Assabet\ river = 7Q10_{Effluent} = 12\ cfs$ (from previous calculation, see Section IV.C.1.a)
- $\boldsymbol{C_s} = In-stream\ copper = 8\frac{\mu g}{L}$ (median in-stream total recoverable copper concentration according to WET tests)
- $\boldsymbol{Q_r} = Flow\ immediately\ downstream\ of\ effluent = Q_e + Q_s = 16.64\ cfs$
- $\boldsymbol{C_r} = Copper\ concentration\ immediately\ downstream\ of\ effluent$

Evaluation & Result:

$$\frac{(4.64\ cfs)(23\frac{\mu g}{L}) + (12\ cfs)(8\frac{\mu g}{L})}{16.64\ cfs} = \frac{110 + 96}{16.64} = 12\frac{\mu g}{L} = C_r$$

$$12\frac{\mu g}{L} < 18.9\frac{\mu g}{L}$$

Under these conditions, the maximum daily instream dissolved copper concentration downstream from the discharge is projected to be 12 µg/L. The projected instream copper concentration downstream from the discharge is less than the site-specific total recoverable copper acute and chronic criteria (18.9 µg/L and 26.8 µg/L, respectively). Therefore, the copper effluent limits of **17 µg/L (monthly average) and 23 µg/L (daily maximum)** in the Current Permit continue to be protective of designated aquatic life uses and are proposed to be carried over to the Draft Permit.

(4) Cadmium, Lead, Nickel, & Zinc

Hudson's WET test data determined whether the facility needed additional metals limits. The 95th percentile of Hudson's effluent data for cadmium, lead, nickel, and zinc represented Hudson's effluent discharge. The median concentration of each metal represented ambient conditions in the Assabet River. Finally, comparing the results of the mass balance to water quality criteria developed in Table 2 determined whether Hudson had reasonable potential to impair the Assabet River its via cadmium, lead, nickel, or zinc discharges:

$$Q_e C_e + Q_s C_s = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_e C_e + Q_s C_s}{Q_r}$$

Where:

- $\boldsymbol{Q_e} = Effluent\ flow = 3\ MGD = 4.64\ cfs$ (design flow)
- $\boldsymbol{C_e} = 95th\ percentile\ effluent\ concentration$ (from WET test effluent data)
- $\boldsymbol{Q_s} = Low\ flow\ in\ Assabet\ River = 7Q10_{Effluent} = 12\ cfs$ (from previous calculation, see Section IV.C.1.a)
- $\boldsymbol{C_s} = In-stream\ metal\ concentration$ (median in-stream metal concentration according to WET test ambient data)
- $\boldsymbol{Q_r} = Flow\ immediately\ downstream\ of\ effluent = Q_e + Q_s = 16.64\ cfs$
- $\boldsymbol{C_r} = Metal\ concentration\ immediately\ downstream\ of\ effluent$

Evaluation & Result:

As summarized in Table 2, the facility's discharge does not have reasonable potential to cause or contribute to a violation of the cadmium, lead, nickel, or zinc criteria in the Assabet River. Therefore, Hudson will not require a limit for cadmium, lead, nickel, or zinc.

Table 2 – Reasonable Potential Analysis for Cadmium, Lead, Nickel and Zinc

A	B	C	D	E	F	G	H		I	J	
Metal	**Q_d**	**C_e[13] (95th Percentile)**	**Q_s**	**C_s[14] (Median)**	**$Q_r = Q_s + Q_e$**	**$C_r = \frac{(Q_eC_e+Q_sC_s)}{Q_R}$**	**Criteria**		**Reasonable Potential**	**Limit = $\frac{(Q_rC_r-Q_sC_s)}{Q_e}$**	
	cfs	**µg/l**	**cfs**	**µg/l**	**cfs**	**µg/l**	**Acute (µg/l)**	**Chronic (µg/l)**	**Cr > Criteria**	**Acute (µg/l)**	**Chronic (µg/l)**
Cadmium[15]	4.644	0	12	0	16.64	0	1.23	0.18	N	N/A	N/A
Lead		0.7017		1		0.92	40.96	1.6	N	N/A	N/A
Nickel		21.991		4.7		9.51	296.67	32.98	N	N/A	N/A
Zinc		45.168		6.5		17.3	75.71	75.71	N	N/A	N/A

[13]Values calculated from the statistical analysis. The statistical analyses are part of the administrative file for this facility.
[14]Median upstream data taken from Whole Effluent Toxicity (WET) tests on the Assabet River just upstream of the Hudson WWTF outfall (see Attachment C, Whole Effluent Toxicity Test Chemistry Data).
[15]The WET data were all, less than 0.5 µg/l, the minimum level. The 95th percentile (C_e) and the in-stream concentration (C_s) are based on half the minimum detection level.

d) 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 lbs/day of nitrogen is discharged by POTWs into the fresh water portion of the watershed and another 2,000 lbs/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 µg/L.[16] 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. Attachment F 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.[17] 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.

e) Ammonia

Ammonia can reduce the receiving stream's dissolved oxygen concentration through nitrification and can also be toxic at elevated levels. MA SWQS for ammonia concentrations are temperature and pH-dependent. Ammonia criteria, therefore, depend on the receiving water's temperature and pH. Massachusetts' SWQS reference the criteria recommended by EPA in *National Recommended Water Quality Criteria:* 2002, EPA 822-R-02-047.[18] These include the 1999 ammonia criteria (see EPA document EPA-822-R-99-014).

(1) Criteria Calculation[19]

(a) Winter Acute Criteria

Where:

- $\boldsymbol{pH} = Receiving\ water\ mean\ pH = 7.23$
- $\boldsymbol{Winter\ CMC} = \mathbf{19.7}\ \boldsymbol{mg/L}$

[16] 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.
[17] Howes, Brian, et al, Site-Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators Interim Report, Massachusetts Estuaries Project, December 22, 2003.
[18] 314 CMR § 4.06(5)(e)
[19] Calculated using tables from *1999 Update of Ambient Water Quality Criteria for Ammonia.* 1999. Environmental Protection Agency (EPA). Pg. 86-87

(b) Summer Acute Criteria

Where:

- $\boldsymbol{pH} = Receiving\ water\ mean\ pH = 7.23$
- $\boldsymbol{Summer\ CMC} = \mathbf{19.7}\ \boldsymbol{mg/L}$

(c) Winter Chronic Criteria

Where:

- $\boldsymbol{pH} = Receiving\ water\ mean\ pH = 7.23$
- $\boldsymbol{T} = Temperature = 5℃$
- $\boldsymbol{Winter\ CCC} = \mathbf{5.39}\ \boldsymbol{mg/L}$

(d) Summer Chronic Criteria

Where:

- $\boldsymbol{pH} = Receiving\ water\ mean\ pH = 7.23$
- $\boldsymbol{T} = Temperature = 25℃$
- $\boldsymbol{Summer\ CCC} = \mathbf{2.57}\ \boldsymbol{mg/L}$

(2) Ammonia Current Limit Analysis

The Current Permit includes a monthly average ammonia limit of 10 mg/L for the months of November through May, monthly average, weekly average and maximum daily limits in June through October that are 3.0 mg/L, 3.0 mg/L, and 5.0 mg/L respectively. These limits were based on the WLA provided in the Assabet River Water Quality Management Plan.[20] Review of the monitoring data in the DMRs from December 2011 to October 2016, provided in Attachment B, shows that during the warmer months the monthly average ammonia in the effluent averaged 0.6 mg/L µg/L (range 0.01 to 3.77 mg/L), the weekly averages averaged 1.5 mg/L (rage 0.01 to 9.6 mg/L), and the daily maximums averaged 2 mg/L (range 0.09 to 12 mg/L). During the colder months, the monthly average ammonia in the effluent averaged 0.5 mg/L (range 0 to 5.3 mg/L).

To determine if the ammonia limits in the Current Permit continue to be protective of water quality under critical conditions, a mass balance approach, using the highest limit from each season (**5 mg/L in summer** and **10 mg/L winter**), was used to predict downstream ammonia concentrations. The predicted downstream concentrations were compared to chronic water quality criteria corresponding to the season in question. The mass balance equation used to model downstream ammonia concentrations is as follows:

[20] *1989 Assabet River Water Quality Management Plan*. Massachusetts Department of Environmental Quality Engineering. pg. 41

$$Q_e C_e + Q_s C_s = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_e C_e + Q_s C_s}{Q_r}$$

Where:

- $\boldsymbol{Q_e} = Effluent\ flow = 3\ MGD = 4.64\ cfs$ (design flow)
- $\boldsymbol{C_e} = Ammonia\ limit$ (from Current Permit)
- $\boldsymbol{Q_s} = Low\ flow\ in\ Assabet\ river = 7Q10_{Effluent} = 12\ cfs$ (from previous calculation, see Section IV.C.1.a)
- $\boldsymbol{C_s} = In - stream\ ammonia\ concentration = 0.245\ mg/L$ (median in-stream ammonia concentration according to WET test ambient data)
- $\boldsymbol{Q_r} = Flow\ immediately\ downstream\ of\ effluent = Q_e + Q_s = 16.64\ cfs$
- $\boldsymbol{C_r} = Ammonia\ concentration\ immediately\ downstream\ of\ effluent$

As shown in the summary of results in Table 3, the ammonia limits in the Current Permit are sufficient to prevent the discharge from causing or contributing to a violation of water quality standards. Therefore, the effluent limits from the Current Permit are proposed to be continued in the Draft Permit.

Table 3 – Current Permit Ammonia Limit Analysis

A	B	C	D	E	F	G	J		K
Season	**Q_d**	**C_e (Limit)**	**Q_s**	**C_s (Median)**	**$Q_r = Q_s + Q_e$**	**$C_r = \frac{(Q_eC_e+Q_sC_s)}{Q_R}$**	**Criteria**		**Are the effluent limits still protective?**
	cfs	**mg/l**	**cfs**	**mg/l**	**cfs**	**mg/l**	**Acute (mg/l)**	**Chronic (mg/l)**	**Cr < Criteria**
Winter	4.644	10	12	0.245	16.64	2.96	19.7	5.39	Y
Summer		5				0.92	19.7	2.57	Y

f) 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 sediments. A significant amount of this phosphorus in the sediments recycles into the water column during the critical growing period.

The Current Permit includes a monthly average phosphorus limit of 0.1 mg/L and daily maximum phosphorus limit of 0.2 mg/L for the month of April, a monthly average phosphorus limit of 0.1 mg/L for the months of May through October, and a 1.0 mg/L monthly average limit for the months of November through March. The 0.1 mg/L total phosphorus limit for the month of April is a median limit. The

0.1 mg/L total phosphorus limit for May – October is a 60-day rolling average limit. The effluent limits were based on a waste load allocation in a TMDL[21] approved by EPA in 2004. The 2005 permit also has a monitoring and reporting requirement for orthophosphorus from November through March.

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 impoundments (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 in future permitting cycles.

Where wasteload allocations (based on TMDLs) have been established pursuant to 40 C.F.R. § 130.7, any effluent limits in an NPDES permit should be consistent with the assumptions and requirements of those wasteload allocations. *See* 40 C.F.R. § 122.44(d)(1)(vii)(B) ("When developing water quality-based effluent limits…the permitting authority shall ensure that… [e]ffluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 [C.F.R. §] 130.7," i.e., consistent with wasteload allocations established by TMDLs); *see also In re City of Homedale Wastewater Treatment Plant*, NPDES Appeal No. 13-10, slip op. at 7 (EAB Jul. 8, 2014), 16 E.A.D. at , 2014 EPA App. LEXIS 26 (explaining that permit limits need not be identical with the wasteload allocations established by the TMDLs, but only "consistent with" these allocations). In not imposing detailed procedures for establishing permit limits, EPA intended to "give the permitting authority the flexibility to determine the appropriate procedures for developing water quality-based effluent limitations." *Id.*

The TMDL Report concluded that reductions in POTW discharges of total phosphorus during the critical growing season, by themselves, would not suffice to meet the minimum dissolved oxygen concentration standard, would not reduce biomass significantly, would not reduce the percentage of time of dissolved oxygen supersaturation, and would maintain in-stream phosphorus concentrations significantly higher than USEPA guidance. Based on the modeling, best professional judgment, and weight of evidence, the TMDL Report determined that a combination of point source reductions and sediment remediation would be necessary to reduce eutrophication and restore designated uses in the Assabet River. The TMDL Report explicitly observed that assessment of nutrient impacts on rivers is complex and difficult and that projection of water quality for conditions substantially different from those currently existing involves some uncertainty. Based upon the uncertainties in the model projections and the lack of information regarding the feasibility and costs associated with sediment phosphorus control and/or dam removal, the TMDL Report Department proposed a phased adaptive management approach that entailed the introduction of stringent phosphorus controls established at the then limit of technology (0.1 mg/L) at the four major POTWs discharging into the Assabet in the initial permit cycle following TMDL approval, combined with the study of alternatives to reduce sediment phosphorus flux, the two actions together forestalling imposition of water quality-based effluent limits set equal to criteria during the growing season. A critical objective and assumption underlying the TMDL Report was that water quality standards could be achieved faster and, possibly, be more cost effectively, by flexibly adapting to new information concerning sediment phosphorus flux as opposed to simply establishing lower POTW total phosphorus limits during the growing season and waiting for the system to respond over a period of time.

The last of the four Assabet River wastewater treatment facility upgrades to achieve the 0.1 mg/L phosphorus limits was completed in early 2012. In order to determine changes in water quality resulting

[21] 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.

from the treatment facility upgrades, USEPA Region 1 conducted water quality sampling of the Assabet River during summer low flow conditions in 2012.[22] 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 levels of Duckweed growth in the impoundments (see 12/19/12 document entitled "Assabet 2012 Duckweed Monitoring on the Assabet River"). The survey found levels of Duckweed in the Assabet River impoundments remain excessive.

Although the Region continues to evaluate lower phosphorus limits during the critical growing season in future permitting cycles should they become necessary, it has opted to retain the existing growing season limits of 0.1 mg/L in this permit cycle, while imposing new, numeric limits during the non-growing season in light of new information that has become available since the TMDL was approved and initial permits issued. The TMDL Report concluded that phosphorus effluent limits during the non-growing season were not necessary; however, year-round monitoring and reporting of effluent data for total and dissolved phosphorus would be required because of concerns that particulate phosphorus potentially could settle in the impoundments during the non-growing season and become available for plant growth during the growing season. In addition, the POTWs would be required to optimize the removal of particulate phosphorus during the non-growing season.

Following the approval of the TMDL, a study was conducted by the Army Corps of Engineers (COE) 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 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 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.[23] This finding is material and warrants both the retention of the existing growing season limits of 0.1 mg/L, although with a more stringent averaging period, and the imposition of new, numeric non-growing season limits. EPA recognizes the inherent uncertainty of projecting receiving water impacts given the complexity of receiving water conditions, particularly the extent to which, and pace at which, sediment phosphorus reductions will occur given the previous imposition of growing season limits and new non-growing season limits. EPA has concluded that is reasonable, in light of this uncertainty, to continue to evaluate how the receiving water continues to respond to these new controls over the course of a permitting cycle. In evaluating the sufficiency of this approach under the Act, EPA has also taken specific notice of the actual, rather than permitted, levels of phosphorus effluent reductions being achieved at the four major POTWs, which are consistently achieving levels lower than required under the permits. EPA has also accounted for the fact that it takes time for a receiving water to respond to reductions in nutrient loading. It will continue to monitor the receiving water response to these new limitations to inform any more stringent limitations that may be necessary in the next permit cycle.

Consequently, the Draft Permit proposes an average monthly total phosphorus effluent limit of 0.1 mg/L for April through October. The averaging period has been changed from a median in April and 60-day

[22] Faber, Tom. 2013. Assabet River Water Quality Survey, July 10-13, 2012, Data Report. USEPA New England Regional Laboratory.
[23] CDM 2008. Assabet River Sediment and Dam Removal Study, Modeling Report, June 2008

rolling average from May through October to an average monthly limit from April through October. This is consistent with 40 C.F.R.§ 122.45(d)(2), which requires limitations for POTWs be established as average weekly and average monthly limitations unless impracticable. The TMDL requires that seasonal limits for total phosphorus be applicable from April 1 through October 31 (summer) and November 1 through March 31. An average monthly effluent limit of 0.2 mg/L for November through March is also 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).[24]

The monitoring and reporting orthophosphorus requirement is no longer a requirement in the Draft Permit. EPA's intention in requiring winter orthophosphorus 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 orthophosphorus 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 do 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 orthophosphorus in the wintertime or add such monitoring in the summertime. Therefore, EPA has removed the orthophosphorus monitoring requirement that was in the Current Permit.

g) Whole Effluent Toxicity Testing

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[25] current toxic policies require toxicity testing for all dischargers such as Hudson WWTP. 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

[24] 314 CMR 4.00: Massachusetts Surface Water Quality Standards
[25] Implementation Policy for the Control of Toxic Pollutants in Surface Waters, MassDEP 1990

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 Current Permit are C-NOEC greater than or equal to 31% 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 the acute LC_{50} limits and had one violation of the chronic C-NOEC limit in 2011 as can be seen from the DMR summary in Attachment B. It is noted that as part of a previous permit issuance, EPA eliminated the required testing for the fathead minnow (*Pimephales promelas*) based on WET Testing results as *Ceriodaphnia 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 1.0, and in accordance with EPA national and regional policy and 40 C.F.R. § 122.44(d), the Draft Permit continues the effluent limits from the Current Permit including the test organism and the testing frequency. Toxicity 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).

E. Sludge Information & Requirements

Hudson WWTP co-blends and processes its sludge in its primary clarifier. Sludge from the primary and final clarifier is held in a sludge storage tank. It is sent to Waste USA Landfill, 21 Landfill Lane, Coventry, VT 05825 via New England Organics, a company based out of Concord, New Hampshire.

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.

F. Sewer System Operation & Maintenance

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 Current Permit, including collection system mapping, and preparation of a collection system operation and maintenance plan. EPA has determined that these additional requirements are necessary to ensure the proper operation and maintenance of the POTW and the requirements have been included in POTW NPDES Permits recently issued in Massachusetts.

G. Industrial Pretreatment

The permittee is being required to develop an Industrial Pretreatment Program based on authority granted under 40 C.F.R. Part 403 and Section 307 of the CWA. A Pollutant introduced into POTWs by a non-domestic source shall not pass through the POTW or interfere with the operation or performance of the treatment works.[26] Further, a POTW with a design flow under 5 MGD may be required to develop an Industrial Pretreatment Program if its effluent limits are exceeded by industrial influent.[27] Hudson's permit at Section I.A.4 has an effluent condition which says that, "Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards." Bis-2 (ethylhexyl) phthalate is a toxic component of the effluent and bioaccumulates in wildlife, posing a threat to fish consumption. Hudson's application indicated its effluent had a monthly average bis-2 (ethylhexyl) phthalate concentration of 21 µg/L. Subsequent testing in August 2017 indicated an effluent bis-2 (ethylhexyl) phthalate concentration of 34 µg/L. These tests indicate that Hudson WWTP has reasonable potential to violate bis-2 (ethylhexyl) phthalate state and federal WQS. Plastic manufacturing is a common source of bis-2 (ethylhexyl) phthalate, and Hudson WWTP is aware of at least two plastic manufacturers in its service area. Unless the high concentrations of bis-2 (ethylhexyl) phthalate are from domestic sources, they are likely from industrial sources. Thus, Hudson's effluent limits are likely exceeded by industrial influent, and as such it is required to develop an Industrial Pretreatment Program.[28]

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

Lastly, upon approval of the development of a pretreatment program, the permittee must submit a pretreatment report detailing the activities of the program for the twelve-month period ending 60 days prior to the due date.

[26] 40 CFR §403.5(a)(1)
[27] 40 CFR §403.8(a)
[28] *Id.*

V. Unauthorized Discharges

This permit only authorizes the discharge from the wastewater treatment plant outfall 001. Other discharges of wastewater, such as pump station emergency overflows or sanitary sewer overflows are not authorized and must be reported in accordance with reporting requirements found in Section C.4.d of Part II of the permit ("24-hour reporting"), including requirements for both oral notice within 24 hours and written notice within 5 days.

A. Anti-Degradation Review

The Massachusetts anti-degradation regulations (314 CMR 4.04) require that all existing uses of the Assabet River must be protected. There are no new or increased discharges being proposed in the Draft Permit. Thus, MassDEP has indicated that it believes there will be no lowering of water quality and/or no loss of existing water uses for this segment of the river as a result of the Draft Permit and that no additional anti-degradation review is warranted.

VI. Essential Fish Habitat Determination

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C § 1801 et seq.(1998)), EPA is required to consult with the National Marine Fisheries Service ("NMFS") if EPA's 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 which reduces the quality and/or quantity of EFH, 50 CFR § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. § 1855 (b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

There is no "habitat of particular concern," as defined under § 600.815 (a)(9) of the Magnuson-Stevens Act, designated for this site.

EPA and MassDEP have determined that a formal EFH consultation with NMFS for this discharge is not required. The proposed discharge permit is developed to meet MA SWQS and will not adversely impact EFH.

VII. Endangered Species Act

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

Section 7(a)(2) of the ESA requires every federal agency, in consultation with and with the assistance 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") administer Section 7 consultations for freshwater species. The National Marine Fisheries Service ("NOAA Fisheries") administers Section 7 consultations for marine species and anadromous fish.

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 Current 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 Hudson discharge and, therefore, a formal EPA consultation will not be required for this discharge.

VIII. Monitoring and Reporting

A. 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.*[29] 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)

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

(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[30] ("ML") is at or below the level of the applicable water quality 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.

B. 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.[31]

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.

IX. State Certification Requirements

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate 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

[30] 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 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.
[31] https://netdmr.zendesk.com/hc/en-us/articles/209616266-EPA-Region-1-NetDMR-Information

§ 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).

X. Public Comment Period and Procedures for Final Decision

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to Evan Lewis, U.S. EPA, Office of Ecosystem Protection, Municipal Permits Branch, 5 Post Office Square-Suite 100, Mailcode OEP06-4, Boston, Massachusetts 02109-3912 or via email to lewis.evan@epa.gov.

Any person, prior to such date, may submit a request in writing for a public hearing to consider the Draft Permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public 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 Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

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

XI. EPA and MassDEP Contacts

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

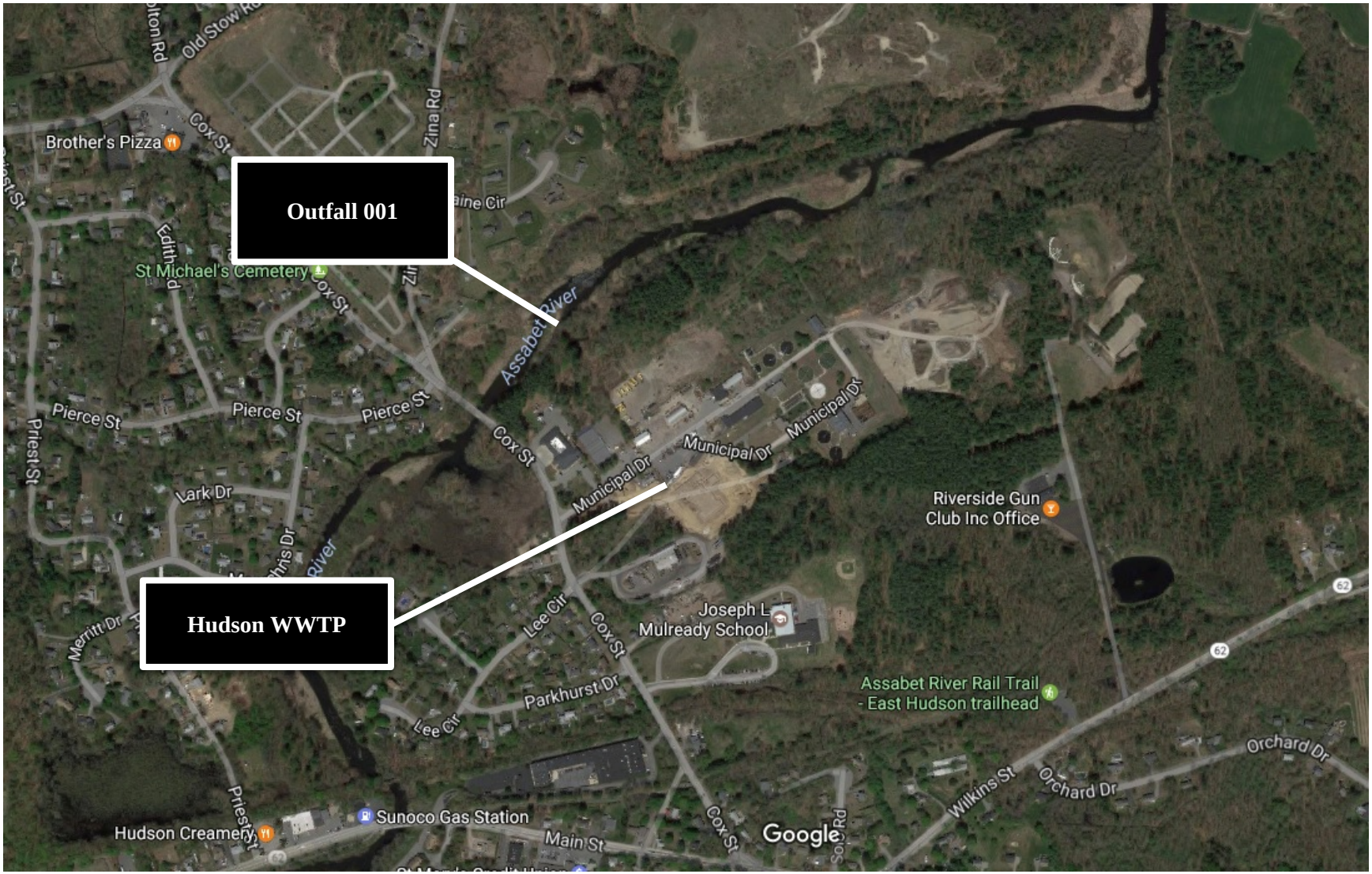
Evan Lewis
US Environmental Protection Agency
5 Post Office Square – Suite 100
Mailcode: OEP06-4
Boston, MA 02109-3912
Telephone: (617) 918-1543
Facsimile: (617) 918-0543
lewis.evan@epa.gov

Jennifer Wood
Massachusetts Department of Environmental Protection
Bureau of Water Resources
1 Winter Street
Boston, MA 02108
Telephone: (617) 654-6536
jennifer.wood@state.ma.us

Date:

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

ATTACHMENT A – WWTP LOCATION



Aerial view taken from www.google.com/maps on February 9, 2017

ATTACHMENT B – SUMMARY OF DMR DATA

Monitoring Period End Date	BOD, 5-day (limit below)								
	332 lb/d	442 lb/d	663 lb/d	995 lb/d	15 mg/L	20 mg/L	30 mg/L	45 mg/L	25 mg/L
	S. MO AVG	S. WKLY AVG	W. MO AVG	W. WKLY AVG	S. MO AVG	S. WKLY AVG	W. MO AVG	W. WKLY AVG	S. DAILY MX
12/31/2011	--	--	109	219	--	--	5	12	20
1/31/2012	--	--	83	128	--	--	4	9	14
2/29/2012	--	--	41	73	--	--	3	5	5
3/31/2012	--	--	53	64	--	--	3	4	5
4/30/2012	88	218	--	--	5	12	--	--	19
5/31/2012	46	61	--	--	3	4	--	--	4
6/30/2012	37	44	--	--	2	3	--	--	3
7/31/2012	25	38	--	--	2	3	--	--	3
8/31/2012	33	56	--	--	3	5	--	--	5
9/30/2012	35	49	--	--	3	5	--	--	5
10/31/2012	30	46	--	--	3	4	--	--	4
11/30/2012	--	--	30	60	--	--	3	5	5
12/31/2012	--	--	41	77	--	--	4	6	6
1/31/2013	--	--	79	139	--	--	5	10	11
2/28/2013	--	--	77	147	--	--	5	8	10
3/31/2013	--	--	92	172	--	--	4	8	8
4/30/2013	63	82	--	--	3	5	--	--	6
5/31/2013	33	39	--	--	1	5	--	--	3
6/30/2013	27	50	--	--	1	3	--	--	5
7/31/2013	52	50	--	--	4	5	--	--	6
8/31/2013	44	47	--	--	4	4	--	--	4
9/30/2013	41	49	--	--	4	5	--	--	5
10/31/2013	30	39	--	--	3	4	--	--	4
11/30/2013	--	--	35	42	--	--	3	4	4
12/31/2013	--	--	36	63	--	--	3	4	5
1/31/2014	--	--	55	63	--	--	4	5	5
2/28/2014	--	--	50	73	--	--	3	5	6
3/31/2014	--	--	62	85	--	--	4	5	5
4/30/2014	80	113	--	--	3	4	--	--	4

Monitoring Period End Date	BOD, 5-day (limit below)								
	332 lb/d	442 lb/d	663 lb/d	995 lb/d	15 mg/L	20 mg/L	30 mg/L	45 mg/L	25 mg/L
	S. MO AVG	S. WKLY AVG	W. MO AVG	W. WKLY AVG	S. MO AVG	S. WKLY AVG	W. MO AVG	W. WKLY AVG	S. DAILY MX
5/31/2014	53	66	--	--	3	4	--	--	4
6/30/2014	60	110	--	--	4	8	--	--	10
7/31/2014	44	91	--	--	4	8	--	--	12
8/31/2014	34	39	--	--	3	4	--	--	4
9/30/2014	67	39	--	--	6	18	--	--	20
10/31/2014	29	34	--	--	2	3	--	--	4
11/30/2014	--	--	33	41	--	--	3	3	4
12/31/2014	--	--	81	224	--	--	3	8	9
1/31/2015	--	--	0	0	--	--	0	0	0
2/28/2015	--	--	13	25	--	--	1	2	0
3/31/2015	--	--	12	41	--	--	1	2	2
4/30/2015	24	12	--	--	0	1.5	--	--	3
5/31/2015	25	32	--	--	2	3	--	--	3
6/30/2015	25	40	--	--	2	4	--	--	4
7/31/2015	26	59	--	--	2	3	--	--	4
8/31/2015	20	29	--	--	2	3	--	--	3
9/30/2015	15	23	--	--	2	3	--	--	3
10/31/2015	7	30	--	--	1	3	--	--	4
11/30/2015	--	--	17	31	--	--	2	3	3
12/31/2015	--	--	12	40	--	--	1	3	6
1/31/2016	--	--	5	20	--	--	0.4	1.5	3
2/29/2016	--	--	58	107	--	--	4	10	13
3/31/2016	--	--	10	31	--	--	1	2	2
4/30/2016	9	65	--	--	1	4	--	--	4
5/31/2016	19	32	--	--	2	3	--	--	3
6/30/2016	22	44	--	--	2	4	--	--	5
7/31/2016	14	20	--	--	2	2.5	--	--	3
8/31/2016	17	26	--	--	2	3	--	--	3
9/30/2016	12	13	--	--	2	2	--	--	3
10/31/2016	28	43	--	--	3	5	--	--	5
Maximum	88	218	92	224	6	18	5	10	20
Minimum	7	12	0	0	0	1.5	0	0	0
Average	35	52	45	82	3	5	3	5	6
Median	30	44	41	63.5	2	4	3	5	4

Outfall 001

Monitoring Period End Date	TSS (limit below)								
	332 lb/d	442 lb/d	663 lb/d	995 lb/d	15 mg/L	20 mg/L	30 mg/L	45 mg/L	25 mg/L
	S. MO AVG	S. WKLY AVG	W. MO AVG	W. WKLY AVG	S. MO AVG	S. WKLY AVG	W. MO AVG	W. WKLY AVG	S. DAILY MX
12/31/2011	--	--	55	115	--	--	3	6	11
1/31/2012	--	--	131	156	--	--	3	11	16
2/29/2012	--	--	65	100	--	--	4	7	13
3/31/2012	--	--	80	107	--	--	5	7	14
4/30/2012	34	88	--	--	2	7	--	--	13
5/31/2012	87	129	--	--	5	8	--	--	8
6/30/2012	18	73	--	--	1	5	--	--	9
7/31/2012	34	55	--	--	3	5	--	--	9
8/31/2012	17	78	--	--	1	6	--	--	11
9/30/2012	49	92	--	--	4	8	--	--	9
10/31/2012	19	97	--	--	2	9	--	--	9
11/30/2012	--	--	38	114	--	--	2	9	12
12/31/2012	--	--	45	137	--	--	3	10	14
1/31/2013	--	--	92	146	--	--	3	11	12
2/28/2013	--	--	98	135	--	--	3	6	11
3/31/2013	--	--	129	207	--	--	5	9	10
4/30/2013	108	149	--	--	5	9	--	--	9
5/31/2013	104	93	--	--	6	7	--	--	10
6/30/2013	118	219	--	--	6	9	--	--	10
7/31/2013	20	183	--	--	2	7	--	--	14
8/31/2013	46	80	--	--	4	7	--	--	13
9/30/2013	66	66	--	--	1	3	--	--	6
10/31/2013	7	38	--	--	1	4	--	--	7
11/30/2013	--	--	53	124	--	--	5	12	13
12/31/2013	--	--	43	132	--	--	4	11	16
1/31/2014	--	--	82	142	--	--	5	10	10
2/28/2014	--	--	82	110	--	--	3	6	12
3/31/2014	--	--	88	123	--	--	5	6	7
4/30/2014	162	162	--	--	1	4	--	--	7
5/31/2014	16	65	--	--	1	4	--	--	7
6/30/2014	12	49	--	--	1	4	--	--	7
7/31/2014	28	56	--	--	2	5	--	--	9
8/31/2014	57	60	--	--	5	5	--	--	5
9/30/2014	63	79	--	--	2	5	--	--	9
10/31/2014	70	86	--	--	3	6	--	--	11

Monitoring Period End Date	TSS (limit below)								
	332 lb/d	442 lb/d	663 lb/d	995 lb/d	15 mg/L	20 mg/L	30 mg/L	45 mg/L	25 mg/L
	S. MO AVG	S. WKLY AVG	W. MO AVG	W. WKLY AVG	S. MO AVG	S. WKLY AVG	W. MO AVG	W. WKLY AVG	S. DAILY MX
11/30/2014	--	--	22	47	--	--	2	4	7
12/31/2014	--	--	53	265	--	--	2	10	12
1/31/2015	--	--	15	60	--	--	1	4	8
2/28/2015	--	--	10	40	--	--	1	3	6
3/31/2015	--	--	0	0	--	--	0	0	0
4/30/2015	12	55	--	--	1	3.5	--	--	7
5/31/2015	0	0	--	--	0	0	--	--	0
6/30/2015	19	52	--	--	2	5	--	--	9
7/31/2015	11	103	--	--	2	5	--	--	9
8/31/2015	0	0	--	--	0	0	--	--	0
9/30/2015	10	28	--	--	1	3	--	--	6
10/31/2015	6	24	--	--	1	2.5	--	--	5
11/30/2015	--	--	13	27	--	--	1	3	5
12/31/2015	--	--	5	27	--	--	1	2.5	5
1/31/2016	--	--	8	32	--	--	1	2.5	5
2/29/2016	--	--	52	208	--	--	3	14	14
3/31/2016	--	--	15	42	--	--	1	2.5	5
4/30/2016	21	48	--	--	1	3	--	--	6
5/31/2016	18	37	--	--	2	3.5	--	--	4
6/30/2016	12	36	--	--	1	3.5	--	--	5
7/31/2016	26	42	--	--	3	5	--	--	7
8/31/2016	18	26	--	--	2	3	--	--	6
9/30/2016	69	259	--	--	9	**32**	--	--	**42**
10/31/2016	2	10	--	--	0.3	1	--	--	2
Maximum	162	259	129	265	9	32	5	14	42
Minimum	0	0	0	0	0	0	0	0	0
Average	39	78	53	110	2	6	3	7	9
Median	20	65	52.5	114.5	2	5	3	6.5	9

Outfall 001

Monitoring Period End Date	Flow (limit below)			Total Residual Chlorine (limit below)		Fecal Coliform (limit below)		pH (limit below)		Total Phosphorus (limit below)			
	Mon, MGD	Mon, MGD	3 MGD	0.035 MG/L	0.061 MG/L	200, #/100mL	400, #/100mL	6, SU	8, SU	0.1 MG/L	1 MG/L	0.1 MG/L, APRIL	0.2 MG/L, APRIL
	D. MX	MO AVG	12 MO AVG	MO AVG	D. MX	MO GEO	D. MX	MIN	MAX	S. MO MEDIAN	W. MO AVG	MO AVG	D. MX
12/31/2011	3.63	2.58	2.21	0.009	0.05	7	14	6.8	7.5	--	0.28	--	0.4
1/31/2012	2.6	1.99	2.23	0.008	0.04	4	9	6.5	7.7	--	0.06	--	0.09
2/29/2012	2.25	1.89	2.22	0.008	0.05	7	128	6.8	7.7	--	0.21	--	0.39
3/31/2012	2.17	1.85	2.1	0.008	0.05	11	22	6.7	**8.8**	--	0.18	--	0.3
4/30/2012	2.44	1.75	2.04	0.01	0.03	17	204	6.8	7.6	0.09	--	0.09	**0.76**
5/31/2012	2.41	1.94	2.03	0.01	0.04	4	20	6.8	**8.7**	**0.17**	--	--	**1.5**
6/30/2012	2.2	1.83	2.03	0.006	0.04	3	3	7	7.7	**0.14**	--	--	0.11
7/31/2012	1.54	1.44	2.02	0.003	0.02	3	13	6.9	7.5	0.09	--	--	0.13
8/31/2012	1.69	1.46	2	0.016	**0.14**	7	27	6.7	7.6	0.09	--	--	0.12
9/30/2012	1.53	1.32	1.92	0.002	0.03	32	192	6.8	7.6	0.09	--	--	0.15
10/31/2012	1.97	1.4	1.83	0.01	0.03	7	123	6.8	7.4	0.07	--	--	0.14
11/30/2012	1.84	1.55	1.75	0.007	0.03	65	**845**	6.8	7.5	--	0.1	--	0.11
12/31/2012	2.21	1.62	1.67	0.007	0.04	12	72	6.6	7.6	--	0.15	--	0.21
1/31/2013	1.94	1.76	1.65	0.005	0.05	7	108	6.8	7.4	--	0.17	--	0.34
2/28/2013	3.04	1.77	1.64	0.012	0.05	9	132	6.6	7.4	--	0.15	--	0.2
3/31/2013	3.85	2.84	1.72	0.011	0.04	10	32	6.7	7.5	--	0.11	--	0.15
4/30/2013	2.43	2.02	1.74	0.016	0.05	7	26	6.8	7.2	0.08	--	0.08	0.15
5/31/2013	1.85	1.62	1.72	0.012	0.04	10	27	6.7	7.5	0.08	--	--	0.1
6/30/2013	4.08	2.42	1.77	0.016	0.04	9	**1121**	6.8	7.6	0.09	--	--	0.12
7/31/2013	1.89	1.61	1.78	0.019	0.05	45	**1120**	6.8	7.7	0.09	--	--	0.15
8/31/2013	1.56	1.38	1.78	0.024	0.05	16	192	6.9	7.6	0.09	--	--	0.13
9/30/2013	1.41	1.33	1.78	0.017	0.04	22	112	6.9	7.5	0.08	--	--	0.17
10/31/2013	1.36	1.28	1.77	0.009	0.04	7	42	6.9	7.5	0.09	--	--	0.24
11/30/2013	1.47	1.28	1.74	0.008	0.04	15	110	7	7.5	--	0.17	--	0.4
12/31/2013	1.88	1.5	1.73	0.01	0.05	77	377	6.8	7.4	--	0.25	--	0.52
1/31/2014	2.15	1.82	1.74	0.019	0.05	2	3	6.8	7.8	--	0.16	--	0.21
2/28/2014	1.97	1.68	1.73	0.015	0.03	4	8	6.9	7.5	--	0.16	--	0.18
3/31/2014	4.59	2.22	1.68	0.009	0.05	2	3	6.8	7.5	--	0.1	--	0.12
4/30/2014	4.01	2.66	1.73	0.008	0.05	5	21	6.9	7.5	**0.115**	--	**0.115**	0.17
5/31/2014	2.88	2.1	1.77	0.008	0.04	8	73	6.9	7.5	0.1	--	--	0.14
6/30/2014	1.88	1.65	1.71	0.008	0.04	4	--	6.9	7.8	0.07	--	--	0.1
7/31/2014	1.58	1.44	1.7	0.005	0.04	15	234	7	7.6	0.07	--	--	0.19

Monitoring Period End Date	Flow (limit below)			Total Residual Chlorine (limit below)		Fecal Coliform (limit below)		pH (limit below)		Total Phosphorus (limit below)			
	Mon, MGD	Mon, MGD	3 MGD	0.035 MG/L	0.061 MG/L	200, #/100mL	400, #/100mL	6, SU	8, SU	0.1 MG/L	1 MG/L	0.1 MG/L, APRIL	0.2 MG/L, APRIL
	D. MX	MO AVG	12 MO AVG	MO AVG	D. MX	MO GEO	D. MX	MIN	MAX	S. MO MEDIAN	W. MO AVG	MO AVG	D. MX
8/31/2014	1.54	1.37	1.69	0.015	0.04	7	13	7.1	7.8	0.08	--	--	0.2
9/30/2014	1.46	1.35	1.7	0.015	0.04	6	21	7	7.7	0.08	--	--	0.12
10/31/2014	1.84	1.43	1.71	0.017	0.04	0	0	6.9	7.5	0.1	--	--	0.35
11/30/2014	2.18	1.58	1.73	0.014	0.04	5	8	7	7.5	--	0.09	--	0.23
12/31/2014	3.35	2.3	1.8	0.012	0.04	7	80	6.9	7.6	--	0.03	--	0.1
1/31/2015	2.24	1.78	1.8	0.015	0.05	0	0	6.9	7.4	--	0.02	--	0.08
2/28/2015	1.62	1.51	1.78	0.015	0.03	8	8	7	7.8	--	0.05	--	0.12
3/31/2015	3.31	2.13	1.78	0.009	0.05	2	2	6.9	7.5	--	0.08	--	0.1
4/30/2015	3.54	2.46	1.76	0.008	0.05	0	0	6.9	7.7	**0.12**	--	**0.12**	**1.3**
5/31/2015	1.82	1.5	1.71	0.008	0.04	32	221	7	7.9	0.18	--	--	0.11
6/30/2015	1.66	1.4	1.69	0.008	0.04	8	--	6.9	7.8	0.08	--	--	0.13
7/31/2015	1.77	1.36	1.68	0.005	0.04	2	2	7.1	7.8	0.09	--	--	0.33
8/31/2015	1.22	1.11	1.66	0.006	0.03	0	0	7.1	8	**0.11**	--	--	0.35
9/30/2015	1.33	1.09	1.64	0.012	0.04	4	31	7.1	8	0.04	--	--	0.07
10/31/2015	1.34	1.18	1.62	0.008	0.04	4	5	6.5	7.9	0.02	--	--	0.018
11/30/2015	1.36	1.24	1.59	0.004	0.04	12	39	7	7.9	--	0.02	--	0.05
12/31/2015	1.82	1.38	1.51	0.004	0.04	0	0	6.6	7.5	--	0.01	--	0.02
1/31/2016	1.94	1.59	1.5	0.004	0.03	0	0	6.9	7.6	--	0	--	0
2/29/2016	2.38	1.66	1.51	0.004	0.04	2	2	6.6	7.5	--	0.04	--	0.14
3/31/2016	2.02	1.76	1.48	0.002	0.04	28	111	6.5	7.6	--	0.01	--	0.02
4/30/2016	2.41	1.74	1.42	0.006	0.03	10	256	6.9	7.9	0	--	0	0.01
5/31/2016	1.56	1.37	1.41	0.005	0.03	3	4	6.6	7.5	0.013	--	--	0.144
6/30/2016	1.4	1.17	1.39	0.005	0.03	3	6	6.8	7.5	0.02	--	--	0.066
7/31/2016	1.1	0.99	1.36	0.008	0.04	6	30	7.1	7.8	0.015	--	--	0.036
8/31/2016	1.05	1	1.35	0.028	**1.08**	13	--	**3.9**	7.8	0.03	--	--	0.266
9/30/2016	1.15	0.99	1.34	0.005	0.03	10	--	7.1	7.8	0.067	--	--	0.471
10/31/2016	1.62	1.11	1.34	0.001	0.03	4	11	7.1	7.6	0.04	--	--	0.08
Maximum	4.59	2.84	2.23	0.028	1.08	77	1121	7.1	8.8	0.18	0.28	0.12	1.5
Minimum	1.05	0.99	1.34	0.001	0.02	0	0	3.9	7.2	0	0	0	0
Average	2.11	1.64	2	0.01	0.06	10	100	7.2		0.08	0.11	0.081	0.22
Median	1.88	1.58	1.73	0.008	0.04	7	26	6.9	7.6	0.08	0.1	0.09	0.14

Monitoring Period End Date	DO (limit below)	Aluminum		Copper	
	6 MG/L (SUMMER)	0.278 MG/L	Mon, MG/L	0.017 MG/L	0.023, MG/L
	DAILY MIN	MO AVG	D. MX	MO AVG	D. MX
12/31/2011	--	0.02	0.02	0.13	0.13
1/31/2012	--	0.1	0.1	**0.028**	**0.28**
2/29/2012	--	0.1	0.1	**0.031**	**0.031**
3/31/2012	--	0.1	0.1	**0.033**	**0.033**
4/30/2012	6.6	0.02	0.02	**0.029**	**0.029**
5/31/2012	7.6	0.1	0.1	**0.029**	**0.035**
6/30/2012	7.4	0.02	0.02	**0.023**	**0.023**
7/31/2012	6.5	0.1	0.1	**0.029**	**0.029**
8/31/2012	6.6	0.1	0.1	**0.029**	**0.032**
9/30/2012	7.7	0.1	0.1	**0.037**	**0.037**
10/31/2012	8.3	0.1	0.1	**0.029**	**0.033**
11/30/2012	--	0.1	0.1	**0.027**	**0.031**
12/31/2012	--	0.1	0.1	**0.032**	**0.035**
1/31/2013	--	0.1	0.1	**0.027**	**0.027**
2/28/2013	--	0.1	0.1	**0.023**	**0.023**
3/31/2013	--	0.021	0.021	**0.025**	**0.025**
4/30/2013	8.3	0.1	0.1	**0.021**	**0.021**
5/31/2013	7.9	0.1	0.1	**0.024**	**0.024**
6/30/2013	7.3	0.1	0.1	0.009	**0.018**
7/31/2013	7	0.1	0.1	**0.018**	**0.018**
8/31/2013	7.2	0.1	0.1	**0.019**	**0.019**
9/30/2013	7.5	0.1	0.1	0.014	0.014
10/31/2013	7.6	0.1	0.1	**0.023**	**0.023**
11/30/2013	--	0.1	0.1	**0.018**	**0.018**
12/31/2013	--	0.1	0.1	**0.043**	**0.046**
1/31/2014	--	0.1	0.1	**0.021**	**0.021**
2/28/2014	--	0.1	0.1	**0.026**	**0.026**
3/31/2014	--	0.1	0.1	**0.021**	**0.021**
4/30/2014	8.5	0.1	0.1	0.012	0.012
5/31/2014	8	0.1	0.1	**0.02**	**0.023**
6/30/2014	7.3	0.1	0.1	0.015	0.015
7/31/2014	7	0.1	0.1	0.013	0.015
8/31/2014	7.3	0.1	0.1	0.014	0.014
9/30/2014	7.3	0.1	0.1	0.011	0.011
10/31/2014	7.7	0.1	0.1	0.0093	0.0093
11/30/2014	--	0.1	0.1	0.01	0.01
12/31/2014	--	0.1	0.1	0.009	0.017

Monitoring Period End Date	DO (limit below)	Aluminum		Copper	
	6 MG/L (SUMMER)	0.278 MG/L	Mon, MG/L	0.017 MG/L	0.023, MG/L
	DAILY MIN	MO AVG	D. MX	MO AVG	D. MX
1/31/2015	--	0	0.1	0.016	0.018
2/28/2015	--	0	0.1	0.026	0.026
3/31/2015	--	0	0	0.015	0.016
4/30/2015	9.1	0	0	0.011	0.011
5/31/2015	8	0	0.1	0.016	0.016
6/30/2015	7.6	0	0	0.021	0.023
7/31/2015	7.9	0	0	0.017	0.018
8/31/2015	7.5	0	0	0.02	0.022
9/30/2015	7.8	0	0	0.015	0.015
10/31/2015	8.3	0	0	0.014	0.014
11/30/2015	--	0	0	0.02	0.02
12/31/2015	--	0	0	0.0155	0.02
1/31/2016	--	0	0	0.015	0.015
2/29/2016	--	0	0	0.014	0.014
3/31/2016	--	0	0	0.013	0.013
4/30/2016	8.2	0	0	0.028	0.028
5/31/2016	6.9	0	0	0.012	0.012
6/30/2016	7	0	0	0.014	0.017
7/31/2016	7.4	0	0	0.011	0.011
8/31/2016	6.6	0	0	0.014	0.014
9/30/2016	7.5	0	0	0.015	0.015
10/31/2016	7	0.1	0.1	0.01	0.01
Maximum	9.1	0.1	0.1	0.04	0.05
Minimum	6.5	0	0	0.009	0.009
Average	7.5	0.06	0.06	0.020	0.021
Median	7.5	0.1	0.1	0.02	0.02

Monitoring Period End Date	Ammonia-Nitrogen (limit below)				
	3 MG/L MO AVG	3 MG/L WKLY AVG	5 MG/L DAILY MAX	10 MG/L MO AVG	Mon, MG/L WKLY AVG
12/31/2011				1.94	3.38
1/31/2012				0.49	1.77
2/29/2012				0.145	0.295
3/31/2012				1.24	4.05
4/30/2012				0.33	0.99
5/31/2012				0.19	0.481
6/30/2012	0.03	0.09	0.1		
7/31/2012	0.125	0.22	0.44		
8/31/2012	0.01	0.05	0.09		
9/30/2012	0.05	0.08	0.19		
10/31/2012	0.14	0.65	1.3		
11/30/2012				0.06	0.23
12/31/2012				0.08	0.27
1/31/2013				0.21	0.28
2/28/2013				0.16	0.31
3/31/2013				0.08	0.32
4/30/2013				0.08	0.22
5/31/2013				0.29	0.42
6/30/2013	1.2	**3.1**	4.1		
7/31/2013	0.23	0.42	0.61		
8/31/2013	0.28	0.33	0.47		
9/30/2013	0.22	0.42	0.66		
10/31/2013	0.23	0.54	0.61		
11/30/2013				0.68	2.2
12/31/2013				5.3	22
1/31/2014				0.09	0.24
2/28/2014				0.19	0.39
3/31/2014				0.11	0.2
4/30/2014				0.13	0.5
5/31/2014				0.31	0.69
6/30/2014	0.91	**3.3**	**5.2**		
7/31/2014	0.3	1.4	1.4		

Monitoring Period End Date	Ammonia-Nitrogen (limit below)				
	3 MG/L	3 MG/L	5 MG/L	10 MG/L	Mon, MG/L
	MO AVG	WKLY AVG	DAILY MAX	MO AVG	WKLY AVG
8/31/2014	0.41	0.98	1.1		
9/30/2014	0.91	1.95	2.6		
10/31/2014	0.18	0.26	0.45		
11/30/2014				0.22	0.32
12/31/2014				0.19	0.53
1/31/2015				0.99	2.8
2/28/2015				0.78	2.6
3/31/2015				0.36	0.56
4/30/2015				0.13	0.42
5/31/2015				0.29	0.45
6/30/2015	0.4	0.65	1.3		
7/31/2015	0.19	0.24	0.28		
8/31/2015	0.2	0.32	0.41		
9/30/2015	0.32	1.02	1.9		
10/31/2015	0.3	0.45	0.61		
11/30/2015				0.39	0.52
12/31/2015				0.28	0.53
1/31/2016				0.07	0.26
2/29/2016				0.22	0.33
3/31/2016				0.2	0.62
4/30/2016				0	0
5/31/2016				0.17	0.27
6/30/2016	0.83	2.7	3.4		
7/31/2016	0.17	0.29	0.34		
8/31/2016	0.11	0.34	0.67		
9/30/2016	2.09	**7.75**	**9.4**		
10/31/2016	**3.77**	**9.6**	**12**		
Maximum	3.77	9.6	12	5.3	22
Minimum	0.01	0.05	0.09	0	0
Average	0.6	1.5	2	0.5	1.5
Median	0.23	0.45	0.66	0.205	0.435

ATTACHMENT C – SUMMARY OF WET TEST DATA

The following effluent characteristics were derived from analysis of discharge monitoring data collected from January 2012 through December 2016. All data is taken from the monthly Discharge Monitoring Reports and quarterly WET tests. Bold, red data indicates a permit violation.

Outfall 001

Monitoring Period End Date	LC50 Static 48 Hr Acute Ceriodaphnia	C-NOEC Static 48 Hr Chronic Ceriodaphnia	Aluminum	Cadmium	Copper	Lead	Nickel	Zinc	Effluent Hardness	pH
	100 %	31 %	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	S.U.
	DAILY MN	DAILY MN	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
12/1/2010	100	100	0.034	<0.0005	0.025	0.0008	0.009	0.011	57	7.3
3/1/2011	100	100	0.059	<0.0005	0.023	0.0006	0.008	0.013	79	7.14
6/1/2011	100	**6.25**	0.026	<0.0005	0.013	<0.0005	0.012	0.007	58	7.37
9/1/2011	100	100	<0.02	<0.0005	0.01	<0.0005	0.006	0.004	65	7.58
12/1/2011	100	100	<0.02	<0.0005	0.013	<0.0005	0.009	0.005	64	7.34
3/1/2012	100	100	<0.02	<0.0005	0.029	<0.0005	0.008	0.013	61	7.31
6/1/2012	100	100	<0.02	<0.0005	0.023	0.0005	0.013	0.007	57	7.35
9/1/2012	100	100	--	--	--	--	--	--	--	7.77
12/1/2012	100	100	--	--	--	--	--	--	--	7.33
3/1/2013	100	100	0.021	<0.0005	0.025	<0.0005	0.006	0.01	79	7.25
6/1/2013	100	100	--	--	--	--	--	--	--	8
9/1/2013	100	100	--	--	--	--	--	--	--	8.1
12/1/2013	100	100	<0.5	<0.001	0.04	<0.005	0.012	0.13	--	8
3/1/2014	--	--	<0.5	<0.001	0.019	<0.005	0.01	0.029	--	--
6/1/2014	100	100	<0.5	<0.001	0.015	<0.005	0.027	<0.025	--	8.1
9/1/2014	100	100	<0.5	<0.001	0.011	<0.005	0.013	<0.025	--	8.1
12/1/2014	100	100	<0.5	<0.001	<0.01	<0.005	0.0088	<0.025	--	8
3/1/2015	100	100	--	--	--	--	--	--	--	8
6/1/2015	--	--	<0.5	--	0.023	<0.005	0.011	<0.025	--	--
9/1/2015	100	50	<0.5	<0.001	0.016	<0.005	0.0088	<0.025	--	8.4
12/1/2015	100	100	<0.5	<0.001	0.011	<0.005	0.015	<0.025	--	8.1
3/1/2016	100	100	<0.5	<0.001	0.013	<0.005	0.011	<0.025	--	8.2
6/1/2016	100	100	<0.5	<0.001	0.017	<0.005	0.012	<0.025	--	8.1
9/1/2016	100	100	<0.5	<0.001	0.015	<0.005	0.02	<0.025	--	8.3

Monitoring Period End Date	LC50 Static 48 Hr Acute Ceriodaphnia	C-NOEC Static 48 Hr Chronic Ceriodaphnia	Aluminum	Cadmium	Copper	Lead	Nickel	Zinc	Effluent Hardness	pH
Count	22	22	19	18	19	19	19	19	8	22
Median	100	100	0.03	0	0.0165	0.0007	0.011	0.0105	62.5	7.325
Maximum	100	100	0.059	--	0.040	0.001	0.027	0.13	79	7.58
Minimum	100	6.25	0.021	--	0.01	0.0006	0.006	0.004	57	7.14
Average	100	90	0.035	--	0.02	0.0007	0.01	0.02	65	7
95th Percentile	--	--	0.055	--	0.03	0.0008	0.02	0.08	79	8

Ambient (upstream of discharge)

Monitoring Period End Date	Ammonia-N	Hardness as CaCO3	Aluminum	Cadmium	Calcium	Copper	Lead	Magnesium	Nickel	Zinc	pH
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	S.U.
	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
12/1/2010	0.37	57	0.38	<0.0005	17	0.009	0.003	3.4	0.003	0.019	6.55
3/1/2011	<0.1	41	0.11	<0.0005	13	0.003	0.001	2.4	<0.002	0.008	6.53
6/1/2011	0.12	71	0.14	<0.0005	22	0.013	0.002	4.6	0.002	0.007	6.83
9/1/2011	<0.1	42	0.088	<0.0005	13	0.005	0.0008	2.5	<0.002	0.004	7.02
12/1/2011	<0.1	40	0.084	<0.0005	11	0.005	<0.0005	2.4	<0.002	0.004	6.83
3/1/2012	<0.1	92	0.068	<0.0005	25	0.008	0.0009	6.3	0.004	0.006	7.15
6/1/2012	<0.1	61	0.27	<0.0005	18	0.012	0.003	3.7	0.004	0.009	7.18
9/1/2012	--	--	--	--	--	--	--	--	--	--	7.77
12/1/2012	--	--	--	--	--	--	--	--	--	--	7.5
3/1/2013	<0.1	56	0.069	<0.0005	17	0.004	<0.0005	3.5	<0.002	0.006	6.72
6/1/2013	--	--		--	11.4	--	--	2.4	--	--	7.5
9/1/2013	--	--	--	--	--	--	--	--	--	--	8
12/1/2013	--	--	<0.5	--	28	0.012	<0.005	6.1	<0.005	<0.025	7.5
3/1/2014	--	--	<0.5	--	25.9	<0.01	<0.005	6	0.0054	<0.025	--
6/1/2014	--	--	<0.5	--	26	<0.01	<0.005	6.8	<0.005	<0.025	7.5
9/1/2014	--	--	<0.5	--	34	<0.01	<0.005	8.9	<0.005	<0.025	7.5
12/1/2014	--	--	<0.5	--	16.2	<0.01	<0.005	3.5	<0.005	<0.025	7.5
3/1/2015	--	--	<0.5	--	23.5	<0.01	<0.005	4.8	<0.005	<0.025	7.5
6/1/2015	--	--	<0.5	--	34.8	<0.01	<0.005	7.6	<0.005	<0.025	--
9/1/2015	--	--	<0.5	--	33	<0.01	<0.005	6.8	<0.005	<0.025	7.9
12/1/2015	--	--	<0.5	--	35.9	<0.01	<0.005	8.2	0.0064	<0.025	7.9
3/1/2016	--	--	<0.5	<0.0005	24.8	<0.01	<0.005	5.2	<0.005	<0.025	7.9
6/1/2016	--	--	<0.5	--	23.8	<0.01	<0.005	6.4	<0.005	<0.025	7.9
9/1/2016	--	--	<0.5	--	82.6	<0.01	<0.005	17.2	0.0075	<0.025	8
Count	8	8	21	9	21	21	21	21	21	21	22
Median	0.245	56.5	0.099	--	23.8	0.008	0.001	5.2	0.004	0.0065	6.83
Maximum	0.37	92	0.38	--	82.6	0.013	0.003	17.2	0.0075	0.019	8
Minimum	0.12	40	0.068	--	11	0.003	0.0008	2.4	0.002	0.004	6.53

ATTACHMENT D – STATISTICAL APPROACH FOR EFFLUENT DATA (N ≥ 10)

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.[32] As "experience has shown that daily pollutant discharges are generally lognormally distributed," *TSD* at App. E, EPA uses a lognormal distribution to model the shape of the observed data, unless analysis indicates a different distributional model provides a better fit to the data. The model parameters (mean and variance) are derived from the monitoring data. The model parameter μ is the mean of the natural logs of the monitoring data values, while σ is the standard deviation of the natural logs of the monitoring data values.

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

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

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

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

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

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

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

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 95th percentile of the distribution, however, involves a relatively straightforward adjustment of the equations given above for the lognormal distribution, as follows.

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

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

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

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

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

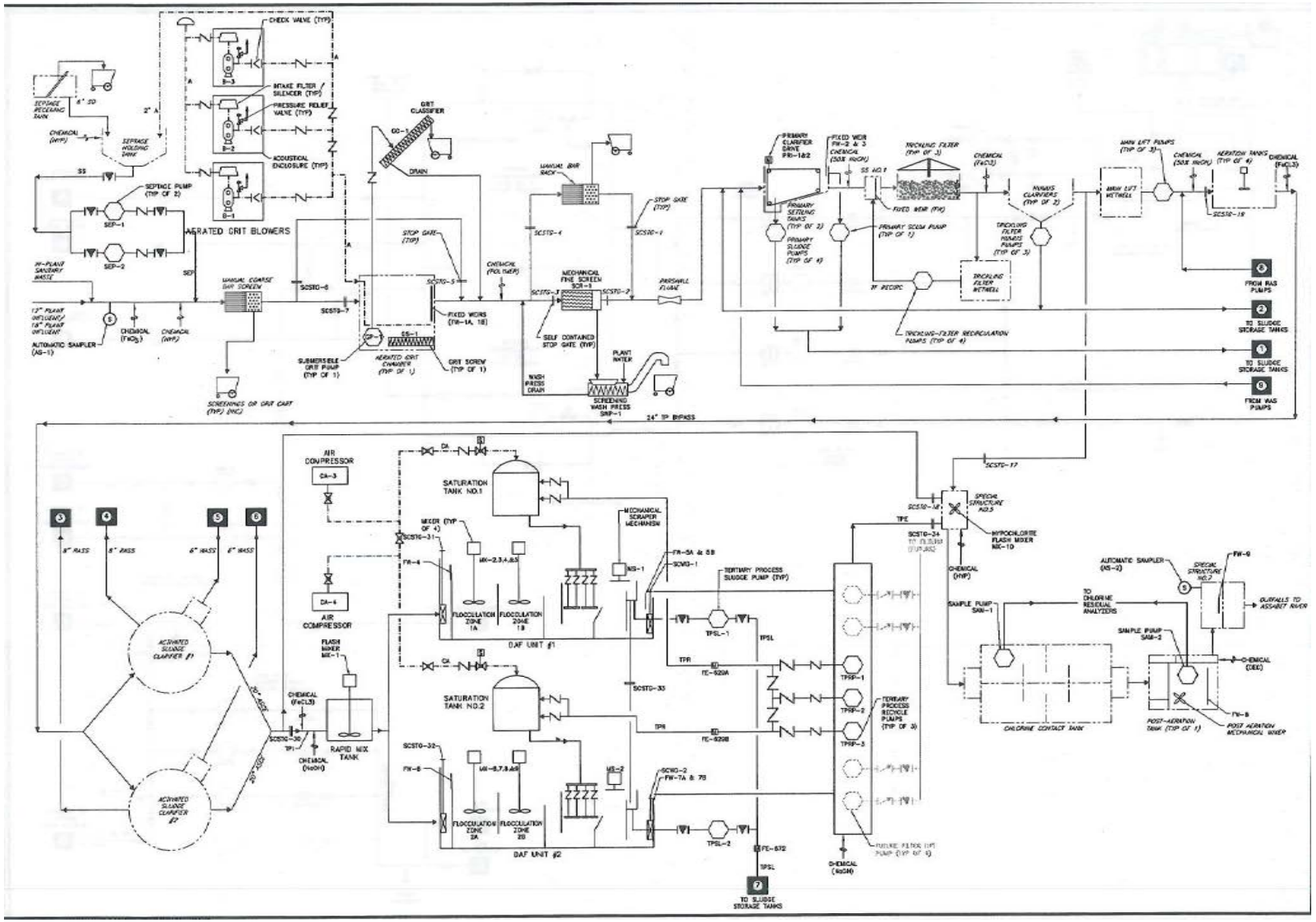
k = total number of dataset
r = number of non-detect values in the dataset
$\delta = r/k$

For the 95th 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

ATTACHMENT E – HUDSON WWTP SCHEMATIC



ATTACHMENT F – SUMMARY OF MERRIMACK RIVER ESTUARY DATA

Table F-1 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

Table F-2 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

		9/26/2017 (dry weather)			10/11/2017 (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	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

**Lower Merrimack Monitoring Project Summer/Fall 2017, EPA New England, March 5, 2018

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.

PUBLIC NOTICE PERIOD: April 11, 2018 – May 10, 2018

PERMIT NUMBER: **MA0101788**

PUBLIC NOTICE NUMBER: MA-012-18

NAME AND MAILING ADDRESS OF APPLICANT:

Town of Hudson
78 Main Street
Town Hall, MA 01749

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Hudson Wastewater Treatment Plant (WWTP)
1 Municipal Drive, Hudson, MA

RECEIVING WATER: Assabet River (Class B)

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 Hudson WWTP, which discharges treated effluent. Sludge from this facility is transported to Wastestream Environmental Inc. in Marlborough, MA for blending and co-composting with municipal solid waste and sent to New England Organics, a company based out of Concord, New Hampshire, to be landfilled at Waste USA Landfill, in Coventry, VT. 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:

Evan Lewis
U.S. Environmental Protection Agency – Region 1
5 Post Office Square, Suite 100 (OEP06-4)
Boston, MA 02109-3912
Telephone: (617) 918-1543
Lewis.Evan@epa.gov

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 May 10, 2018, to the address or email 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
MASSACHUSETTS WASTEWATER MANAGEMENT PROGRAM
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

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