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"),

The Town of Peterborough, New Hampshire

is authorized to discharge from the Wastewater Treatment Plant located at

110 Pheasant Road
Peterborough, NH 03458

to receiving waters named

Contoocook River

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein including, but not limited to, conditions requiring the proper operation and maintenance of the Peterborough Wastewater Treatment Facility collection system.

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

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

This permit supersedes the permit issued on February 27, 2007.

This permit consists of **Part I (**18 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** (Ambient Monitoring Plan) and **Part II (**25 pages including NPDES Part II Standard Conditions).

Signed this 9th day of September, 2016.

/S/ SIGNATURE ON FILE

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

PART I
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated domestic and industrial wastewater from outfall serial number 001 to the Contoocook River. Such discharges shall be limited and monitored by the permittee, as specified below. Samples taken in compliance with the monitoring requirements specified below shall be taken at a location that provides a representative analysis of the discharge.

Effluent Characteristic	Discharge Limitations			Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Effluent Flow	0.62 mgd	---	Report mgd	Continuous Recorder[1]	
$CBOD_5$	25 mg/L 104 lbs/day	40 mg/L 167 lbs/day	45 mg/L 188 lbs/day	2/Week[2]	24 Hour Composite
TSS	30 mg/L 125 lbs/day	45 mg/L 188 lbs/day	50 mg/L 209 lbs/day	2/Week[2]	24 Hour Composite
Total Phosphorus[3]; April 1 – October 31	Report mg/L 3.88 lbs/day	--- ---	Report mg/L ---	1/Week	24 Hour Composite
Total Phosphorus; November 1 – March 31	1.00 mg/L 4.17 lbs/day	---	Report mg/L	1/Week	24 Hour Composite
pH Range[3,4]; Standard Units	6.5 to 8.0 (See I.H.5., State Permit Conditions)			1/Day	Grab
Total Residual Chlorine[5,7]	0.13 mg/L	---	0.23 mg/L	1/Day	Grab
Escherichia coli[5,6]; Colonies/100 mL	126 cfu/100 mL	---	406 cfu/100 mL	3/Week	Grab
Ammonia Nitrogen as N, June 1 – October 31	Report mg/L 75 lbs/day	--- ---	Report mg/L	1/Week	24 Hour Composite
Ammonia Nitrogen as N, November 1 – May 31	Report mg/L	---	Report mg/L	1/Month	24 Hour Composite
Total Recoverable Arsenic	Report µg/L	---	Report µg/L	1/Month	24 Hour Composite
Total Recoverable Aluminum	Report µg/L 0.56 lbs/day	---	Report µg/L	2/Month	24 Hour Composite
Total Recoverable Copper[8]	Report µg/L 0.038 lbs/day	---	Report µg/L	2/Month	24 Hour Composite

Effluent Characteristic	Discharge Limitations			Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Available Cyanide	Report µg/L	---	Report µg/L	1/Quarter	24 Hour Composite
Total Recoverable Lead[9,10]	0.54 µg/L	---	Report µg/L	2/Month	24 Hour Composite
Total Recoverable Silver[11]	Report µg/L	---	Report µg/L 0.0033 lbs/day	2/Month	24 Hour Composite
Total Recoverable Zinc	Report µg/L 0.35 lbs/day		Report µg/L	2/Month	24 Hour Composite
Whole Effluent Toxicity[12,13,14,15,16]	Acute $LC_{50} \geq 100\%$ C-NOEC = Report %			1/Year	24 Hour Composite
Hardness[12]	---	---	Report mg/L	1/Year	24 Hour Composite
Ammonia Nitrogen as N[16]	---	---	Report mg/L	1/Year	24 Hour Composite
Total Recoverable Aluminum[16]	---	---	Report µg/L	1/Year	24 Hour Composite
Total Recoverable Cadmium[16]	---	---	Report µg/L	1/Year	24 Hour Composite
Total Recoverable Copper[16]	---	---	Report µg/L	1/Year	24 Hour Composite
Total Recoverable Nickel[16]	---	---	Report µg/L	1/Year	24 Hour Composite
Total Recoverable Lead[16]	---	---	Report µg/L	1/Year	24 Hour Composite
Total Recoverable Zinc[16]	---	---	Report µg/L	1/Year	24 Hour Composite

FOOTNOTES

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

   The annual average, monthly average, and the maximum daily flows shall be reported. The limit of 0.62 mgd is an annual average, which shall be reported as a rolling 12-month 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.

2. Effluent sampling frequency. The influent shall be sampled twice per month for $CBOD_5$ and TSS using 24-hour composite samples.

3. See Section I.F.2. for special conditions related to ambient monitoring of Powder Mill Pond.

4. State certification requirement.

5. Monitoring for *Escherichia coli* bacteria as described in footnote (6) below shall be conducted concurrently with the daily monitoring for total residual chlorine (TRC) as described in footnote (6) below.

6. The average monthly value for *Escherichia coli* shall be calculated as a geometric mean. *Escherichia coli* shall be tested using an approved method as specified in 40 Code of Federal Regulations (CFR) Part 136, List of Approved Biological Methods for Wastewater and Sewage Sludge.

7. Total residual chlorine shall be measured using any one of the following three methods listed in 40 CFR Part 136:
   a. Amperometric direct.
   b. DPD-FAS.
   c. Spectrophotometric, DPD.

8. The 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.

9. The permittee shall comply with the lead limit in accordance with the schedule contained in Section F below. During the compliance schedule, the interim limit for total recoverable lead is 5 µg/L.

10. The minimum level (ML) for lead is defined as 0.5 µg/L. This value is the minimum level for lead using the Inductively Coupled Plasmas/Mass Spectrometry analytical

method (EPA Method 200.8). This method or other 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.

11. The minimum level (ML) for silver is defined as 0.2 μg/L. This value is the minimum level for silver using the Inductively Coupled Plasmas/Mass Spectrometry analytical method (EPA Method 200.8). 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.

12. LC50 (lethal concentration 50 percent) is the concentration of wastewater causing mortality to 50 % of the test organisms. Therefore, a 100 % limit means that a sample of 100 % effluent (no dilution) shall cause no greater than a 50 % mortality rate in that effluent sample.

13. 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.

14. The permittee shall conduct 48-hour static acute toxicity tests and chronic toxicity tests on effluent samples following the February 2011 USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol (**Attachment A**) and March 2013 USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol (**Attachment B**), respectively. The two species for these tests are the Daphnid (*Ceriodaphnia dubia*) and the Fathead Minnow (*Pimephales promelas*). Toxicity test samples shall be collected and tests completed once per year during the calendar quarter ending September 30th. Toxicity test results are to be postmarked by the 15th day of the month following the end of the quarter sampled.

15. This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical specific limits such as for metals, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered "New Information" and the permit may be modified as provided in 40 CFR Section 122.62(a)(2).

16. For each whole effluent toxicity test, the permittee shall report on the appropriate discharge monitoring report (DMR) the concentrations of the hardness, ammonia nitrogen as nitrogen, total recoverable aluminum, cadmium, copper, lead, nickel, and zinc

found in the 100 percent effluent and ambient samples. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in Attachment A. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

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

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

4. The permittee's treatment facility shall maintain a minimum monthly average of 85 percent removal of both $CBOD_5$ and TSS. The percent removal shall be calculated using the average monthly influent and effluent concentrations.

5. When the effluent discharged for a period of 3 consecutive months exceeds 80 percent of the 0.62 mgd design flow (0.496 mgd), the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans. Before the design flow will be reached, or whenever treatment necessary to achieve permit limits cannot be assured, the permittee may be required to submit plans for facility improvements.

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

7. 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).

8. All POTWs must provide adequate notice to both EPA-New England and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) of the following:

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

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

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

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

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

9. Limitations for Industrial Users

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

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

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

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

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 NHDES in accordance with Part II, Section D.1.e of the General Requirements of this permit (twenty four hour reporting).

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

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

1. Maintenance Staff

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

2. Preventative Maintenance Program

   The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. This requirement shall be described in the Collection System O & M Plan required pursuant to Section 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. combined manholes);
d. All outfalls, including the treatment plant outfall(s), CSOs, combined manholes, and any known or suspected SSOs;
e. All pump stations and force mains;
f. The wastewater treatment facility(ies);
g. All surface waters (labeled);
h. Other major appurtenances such as inverted siphons and air release valves;
i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;
j. The scale and a north arrow; and
k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System Operation and Maintenance Plan

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

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

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

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

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

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and NHDES **annually by March 31**. The first annual report is due 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. If treatment plant flow has reached 80% of the 0.62 mgd design flow (0.5 mgd) based on the daily flow for three consecutive months or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and
f. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the permittee shall

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

E. 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.[1]

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year.

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

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

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

8. The permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by **February 19** (*see also* "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted to the address contained in the reporting section of the permit. If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:

   a. Name and address of contractor(s) responsible for sludge preparation, use or disposal
   b. Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge

9. Compliance with the requirements of this permit or 40 CFR Part 503 shall not eliminate or modify the need to comply with applicable requirements under RSA 485-A and Env-Wq 800, New Hampshire Sludge Management Rules.

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1 This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf

F. SPECIAL CONDITIONS

1. pH Limit Adjustment

The permittee may submit a written request to the EPA-New England requesting a change in the permitted pH limit range to be not less restrictive than 6.0 to 9.0 Standard Units found in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for this facility. The permittee's written request must include the State's approval letter containing an original signature (no copies). The State's letter shall state that the permittee has demonstrated to the State's satisfaction that as long as discharges to the receiving water from a specific outfall are within a specific numeric pH range the naturally occurring receiving water pH will be unaltered. That letter must specify for each outfall the associated numeric pH limit range. Until written notice is received by certified mail from the EPA-New England indicating the pH limit range has been changed, the permittee is required to meet the permitted pH limit range in the respective permit.

2. Ambient Monitoring

The permittee must conduct ambient monitoring in Powder Mill Pond to assess the trophic state of the impoundment, as described in Attachment C. The monitoring will begin in the summer season following 36 months after the effective date of the permit and will continue for a total of three summer seasons.

If the permittee can supply equivalent data collected by other parties, it may submit a written request to EPA New England and NHDES to substitute those data in lieu of monitoring conducted by the permittee. The permittee is required to conduct the ambient monitoring described above, unless written notice is received by certified mail from EPA New England and NHDES indicating that the alternative data is sufficient. Whenever possible, the monitoring must be in accordance with the NHDES Volunteer River Assessment Program Quality Assurance Project Plan.

3. Lead Compliance Schedule

   a. Within 24 months of the effective date of the permit, the permittee shall complete and submit to EPA and DEP an evaluation of alternatives, and an implementation schedule, for achieving the monthly average total lead limit. At a minimum, the evaluation shall include the following:

      (1) An evaluation of alternative water treatment practices, including corrosion control, by Peterborough in order to reduce lead concentrations in the water supply.

      (2) An evaluation of pre-treatment requirements in order to ensure that all significant sources of lead from indirect dischargers are adequately controlled.

(3) An evaluation of all other potentially significant sources of lead in the sewer system and alternatives for minimizing these sources.

(4) An evaluation of alternative modes of operation at the wastewater treatment facility in order to enhance removal of lead.

b. Within 12 months of the effective date of the permit, the permittee shall submit to EPA and DEP a progress report relative to completing the evaluation of alternatives.

c. Within 24 and 36 months from the effective date of the permit, the permittee shall submit to EPA and DEP progress reports relative to implementation of the alternatives identified as necessary to ensure attainment of the lead limit.

d. Within 48 months of the effective date of the permit, the permittee shall comply with the lead limit.

G. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to EPA and the NHDES within the time specified within the permit.

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

The permittee shall continue to submit its monthly monitoring data in Discharge Monitoring Reports (DMRs) to EPA and NHDES 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 NHDES.

2. Submittal of Reports as NetDMR Attachments

Unless otherwise specified in this permit, the permittee shall electronically submit all reports to EPA and NHDES as NetDMR attachments rather than as hard copies. This includes the NHDES Monthly Operating Reports (MORs). (See Part I.G.6. for more information on State reporting.) Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA and NHDES using NetDMR with the next DMR due following the particular report due date specified in this permit.

4. Submittal of Requests and Reports to EPA/OEP

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

a. Transfer of permit notice
b. Request for changes in sampling location
c. Request for reduction in testing frequency
d. Request for reduction in WET testing requirement
e. Report on unacceptable dilution water / request for alternative dilution water for WET testing
f. Notification of proposal to add or replace chemicals and bio-remedial agents including microbes

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

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

5. Submittal of Reports in Hard Copy Form

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

a. Written notifications required under Part II
b. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
c. Sludge monitoring reports

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

All sludge monitoring reports required herein shall be submitted only to:

U.S. Environmental Protection Agency, Region 7
Biosolids Center
Water Enforcement Branch
11201 Renner Boulevard
Lenexa, Kansas 66219

6. State Reporting

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.G.3, I.G.4, and I.G.5 also shall be submitted to the State electronically via email to the permittee's assigned NPDES inspector at NHDES-WD or in hard copy to the following address:

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

7. Verbal Reports and Verbal Notifications

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

617-918-1510

Verbal reports and verbal notifications shall also be made to the permittee's assigned NPDES inspector at NHDES –WD.

H. STATE PERMIT CONDITIONS

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

2. This NPDES discharge permit is issued by EPA under federal and state law. Upon final issuance by EPA, the New Hampshire Department of Environmental Services-Water

Division (NHDES-WD) may adopt this permit, including all terms and conditions, as a state permit pursuant to RSA 485-A:13.

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

4. Pursuant to New Hampshire Statute RSA 485-A13,I(c), any person responsible for a bypass or upset at a *wastewater facility* shall give immediate notice of a bypass or upset to all public or privately owned water systems drawing water from the same receiving water and located within 20 miles downstream of the point of discharge regardless of whether or not it is on the same receiving water or on another surface water to which the receiving water is tributary. Wastewater facility is defined at RSA 485-A:2XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge. The permittee shall maintain a list of persons, and their telephone numbers, who are to be notified immediately by telephone. In addition, written notification, which shall be postmarked within 3 days of the bypass or upset, shall be sent to such persons.

5. The pH range of 6.5 to 8.0 Standard Units (S.U.) must be achieved in the final effluent unless the permittee can demonstrate to NHDES-WD: (1) that the range should be widened due to naturally occurring conditions in the receiving water or (2) that the naturally occurring receiving water pH is not significantly altered by the permittee's discharge. The scope of any demonstration project must receive prior approval from NHDES-WD. In no case, shall the above procedure result in pH limits outside the range of 6.0 – 9.0 S.U., which is the federal effluent limitation guideline regulation for pH for secondary treatment and is found in 40 CFR 133.102(c).

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

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

      (1) Any extension of a collector or interceptor, whether public or private, regardless of flow;

      (2) Any wastewater connection or other discharge in excess of 5,000 gpd;

      (3) Any wastewater connection or other discharge to a WWTP operating in excess of 80 percent design flow capacity based on actual average flow for 3 consecutive months;

      (4) Any industrial wastewater connection or change in existing discharge of industrial wastewater, regardless of quality or quantity; and

(5) Any sewage pumping station greater than 50 gpm or serving more than one building.

7. For each new or increased discharge of industrial waste to the POTW, the permittee shall submit, in accordance with Env-Wq 305.10(a) an "Industrial Wastewater Discharge Request"). The "Industrial Wastewater Discharge Request" shall be prepared in accordance with Env-Wq 305.10(c) .

8. Pursuant to Env-Wq 305.21, at a frequency no less than every five years, the permittee shall submit to NHDES:

   a. A copy of its current sewer use ordinance if it has been revised without NHDES approval subsequent to any previous submittal to the department or a certification that now changes have been made.

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

   c. A list of all permitted indirect dischargers; and

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

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

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

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 ± 1^{o}C or 25 ± 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	≥ 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.

Attachment B

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.

ATTACHMENT C

AMBIENT STREAM MONITORING PROGRAM FOR POWDER MILL POND

The permittee shall conduct ambient monitoring in Powder Mill Pond to assess compliance of the impoundment with state surface water quality standards. Prior to sampling, a sampling and analysis plan (Plan) shall be submitted to NHDES and EPA for approval which includes sampling locations, parameters to be sampled, sample timing and frequency, sampling and laboratory analysis protocols and quality control provisions.

Unless otherwise allowed by NHDES and EPA, the Plan shall include the following:

Monitoring shall be conducted in the summer season following 36 months after the effective date of the permit. Samples shall be collected from the impoundment just upstream of the Powder Mill Dam. See table below for specific monitoring requirements.

Parameters	**Frequency/ Timing of Data Collection**
Dissolved oxygen (mg/L and % Saturation), pH and water temperature (collected with dataloggers)	At least 24 consecutive hours of data per month collected at 15 minute increments during period of low flow ($\leq$3 x 7Q10) and high temperatures (preferably over 25 degrees C). Dataloggers should be set at the bottom of the epilimnion (if stratified) or at 25% depth if not stratified.
Instantaneous Dissolved Oxygen (mg/L and % Saturation) and Water Temperature	1 vertical profile collected on day when continuous dataloggers are deployed. Profile measurements shall be taken in 0.5 m increments beginning 0.1 m below the surface and extending to the bottom.
Total Phosphorus and Chlorophyll-a (uncorrected for pheophytin)	Collect samples at least once per month from July through September. Samples shall be taken in accordance with NH Lake Survey protocols

For each sampling station, the following shall be provided:

- Site map with longitudinal and latitudinal coordinates
- Site description including weather, vegetation, flow conditions, and any other site conditions that would potentially impact water quality
- Photographs of the monitoring location on each day of sampling.

Flow shall be downloaded from the USGS website and saved in a spreadsheet format (such as MS Excel) for USGS gage 01082000, CONTOOCOOK RIVER AT PETERBOROUGH, NH from 10 days prior to the first sampling event to one day after the last sampling event.

Quality assurance/quality control provisions shall include the following:

- During one sampling event replicate samples shall be collected for laboratory analysis (at least one replicate for every 10 samples).
- Multiparameter dataloggers and handheld meters shall be calibrated for dissolved oxygen before each sampling event on-site according to the manufacturer's instructions.
- Field sampling quality control shall consist of 1) replicate analysis (at least one replicate for every 10 samples), 2) maintenance records, 3) field calibration and record of calibration, and 4) record of equipment used.
- Instrument and equipment maintenance shall include: 1) checking field test kits to be sure all reagents are in good working order and are not beyond expiration dates, 2) replacing reagents in accordance with manufacturer's recommendations, 3) calibrating equipment before each sampling event, and 4) recording of maintenance and calibration activities.
- Chain of custody forms and information regarding laboratory standard methods shall be submitted to NHDES with the data.

The Plan shall also specify that all data shall be submitted to NHDES and EPA electronically and in a form that can be automatically uploaded into the NHDES Environmental Monitoring Database (EMD). Information on uploading data to the EMD can be found at http://des.nh.gov/organization/divisions/water/wmb/emd/index.htm or by contacting Melanie Titus at (603) 271-1152 or Melanie.Titus@des.nh.gov.

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

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

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

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

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

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

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

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

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

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

and

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

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

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

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

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

V.1. Use of Reference Toxicity Testing

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

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

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

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

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

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

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

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

VI. CHEMICAL ANALYSIS

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

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

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids[6]	x		--
Total Dissolved Solids[6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon[6]	x	x	0.5
Total Metals[5]			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 2340B (hardness by calculation)
  -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 4500-CL E Low Level Amperometric Titration
  -Method 4500-CL G DPD Colorimetric Method
- USEPA 1983. Manual of Methods Analysis of Water and Wastes
  -Method 330.5

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

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

2. Test Variability (Test Sensitivity)

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

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

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.

- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater that the PMSD lower bound, then the treatment is considered statistically significant.

- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

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

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

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

2. *Pimephales promelas*

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

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

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

3. *Ceriodaphnia dubia*

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

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

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

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

In addition to the summary sheets the report must include:

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

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

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

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

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

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

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

2. Permit Actions

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

3. Duty to Provide Information

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

4. Reopener Clause

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

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

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

5. Oil and Hazardous Substance Liability

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

6. Property Rights

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

7. Confidentiality of Information

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

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

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

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

8. Duty to Reapply

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

9. State Authorities

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

10. Other Laws

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

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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

b. Bypass not exceeding limitations

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

c. Notice

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

d. Prohibition of bypass

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

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

5. Upset

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

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

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

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

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

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

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

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

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

c. Records of monitoring information shall include:

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

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

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

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

2. Inspection and Entry

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

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

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

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

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

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

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

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

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

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

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

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

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

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

e. Twenty-four hour reporting.

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

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

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

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

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

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

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

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

2. Signatory Requirement

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

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

3. Availability of Reports.

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

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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

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

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

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

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

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

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

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

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

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

Construction Activities - The following definitions apply to construction activities:

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

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

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

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

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

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

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

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

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

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

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

Discharge of a pollutant means:

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

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

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

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

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

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

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

EPA means the United States "Environmental Protection Agency".

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NPDES means "National Pollutant Discharge Elimination System".

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

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

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

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

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

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

(a) Sewage from vessels; or

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Waters of the United States means:

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

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

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

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

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

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

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

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

(f) The territorial sea; and

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Range land is open land with indigenous vegetation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Commonly Used Abbreviations

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

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

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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I – NEW ENGLAND
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FACT SHEET

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

NPDES PERMIT No.: **NH0100650**

PUBLIC NOTICE START AND END DATES: May 6th – June 4, 2016

NAME AND ADDRESS OF APPLICANT:

Town of Peterborough
1 Grove Street
Peterborough, New Hampshire 03458

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Town of Peterborough Wastewater Treatment Facility
110 Pheasant Road
Peterborough, New Hampshire 03458

RECEIVING WATER: **Contoocook River (Hydrologic Unit Code: 010700030104-17)**

CLASSIFICATION: **B**

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I. PROPOSED ACTION

The Town of Peterborough Wastewater Treatment Facility (WWTF) has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge treated effluent into the designated receiving water, the Contoocook River. The current permit was issued on February 27, 2007; became effective May 1, 2007; and expired on April 30, 2012. By letter dated November 4, 2011, EPA informed the Town that it would administratively continue coverage for the Peterborough WWTF under the expired permit until the reissuance of a new permit.

II. TYPE OF FACILITY AND DISCHARGE DLOCATION

A. Facility and Outfall Location

The location of the WWTF is shown in **Figure 1**. The geographic coordinates of discharge outfall 001 are listed below:

Outfall No.	Description of Discharge	Outfall Location
001	Secondary Wastewater Treatment Plant Effluent	42º54'27.1"N / 71º56'6.5"W

B. Treatment Process

In August 2012, the Peterborough WWTF was expanded and upgraded from a 0.5 million gallon per day (mgd) lagoon system to a 0.62 mgd activated sludge system. As shown in the process schematic, **Figure 2**, the new system utilizes Aqua-Aerobics Sequencing Batch Reactors (SBRs) as part of its secondary treatment system, which consists of two SBRs. Each SBR is a true batch reactor, which enables the settling process to occur under quiescent conditions. In the SBR process, aeration and settling occur in the same basin.

Each reactor performs 4.5 cycles per day, with each cycle lasting approximately 320 minutes (5.33 hours). Sludge wasted from the SBRs is dewatered and sent to the Merrimack, New Hampshire WWTF to be processed. Treated wastewater from the SBR then goes to a post equalization tank for disinfection by sodium hypochlorite and then to a dechlorination chamber where sodium bisulfite is added. The final treated wastewater effluent is then discharged to the Contoocook River.

The treatment plant upgrade affects the draft permit in terms of monitoring frequency and permit limits. The design flow increase triggered an antidegradation process to preserve water quality in the Contoocook River, as described in Section V.B.5 of this fact sheet. Because the activated sludge process has a shorter residence time than lagoons, the draft permit also requires increased monitoring.

III. DESCRIPTION OF THE DISCHARGE

Appendix A presents monitoring data from August 2012 through November 2014 and metals data from the 2011 antidegradation analysis.

IV. LIMITATIONS AND CONDITIONS

The draft permit contains effluent limitations for effluent flow, five-day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), pH, *Escherichia coli (E. coli)*, total residual chlorine (TRC), total phosphorus, ammonia nitrogen, whole effluent toxicity (WET), aluminum, copper, silver, lead, cyanide, and zinc. In addition, the draft permit contains monitoring requirements for hardness, total recoverable arsenic, cadmium, and nickel. The effluent limitations and monitoring requirements may be found in Part I of the draft NPDES permit.

The basis for each limitation and monitoring requirement found in the draft permit is discussed further in this fact sheet.

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. General Statutory and Regulatory background

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

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits, technology-based effluent limitations and water quality-based effluent limitations (see CWA §§ 301, 303, and 304(b). Also see 40 CFR § Parts 122, 125, and 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted (see CWA §301(b)). As a class, Publicly Owned Treatment Works (POTWs) must meet performance-based requirements, which are based on secondary treatment. The secondary treatment technology guidelines (effluent limits) consist of technology-based requirements expressed in terms of BOD_5/$CBOD_5$, TSS, and pH (see 40 CFR Part 133).

Water quality-based effluent limitations are developed and incorporated into NPDES discharge permits regardless of the decision made with respect to technology and economics in establishing

technology-based limits. Specifically, Section 301(b)(1)(C) of the CWA requires achievement of "any more stringent limitation, including those necessary to meet water quality standards…established pursuant to any State law or regulation…" See 40 CFR §§ 122.4(d), 122.44(d)(1) (providing that a permit must contain effluent limits as necessary to protect State water quality standards, "including State narrative criteria for water quality") (emphasis added) and § 122.45(d)(5) providing in part that a permit incorporate any more stringent limits required by Section 301(b)(1)(C) of the CWA).

The CWA requires that states develop water quality standards (WQS) for all water bodies within the state (see CWA § 303). WQS consist of three elements: (1) one or more designated use for each waterbody or waterbody segment in the state; (2) water quality criteria consisting of numerical concentration levels and/or narrative statements specifying the amounts of various pollutants that may be present in each waterbody without impairing the designated use(s) of that waterbody; and (3) an antidegradation provision focused on protecting high quality waters and protecting and maintaining the level of water quality necessary to protect existing uses (CWA § 303(c)(2)(a) and 40 CFR Part 131.12). The limits and conditions contained in the draft permit reflect the goal of the CWA and EPA to achieve and then to maintain WQS within the receiving water.

The applicable New Hampshire WQS can be found in the New Hampshire Code of Administrative Rules, Surface Water Quality Regulations, Chapter Env-Wq 1700 et seq. See generally, Title 50, Water Management and Protection, Chapter 485A, Water Pollution and Waste Disposal Section 485-A. These regulations were readopted effective May 21, 2008.

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

Under Section 301(b)(1) of the CWA, POTWs must have achieved effluent limitations based upon secondary treatment by July 1, 1977. Since all statutory deadlines for meeting technology-based effluent limitations established pursuant to the CWA have expired, the deadline for compliance with technology-based effluent limits for a POTW is the date of permit issuance (40 CFR § 125.3(a)). Extended compliance deadlines cannot be authorized by a NPDES permit if statutory deadlines have passed. The federal regulations governing EPA's NPDES program are generally found in 40 CFR Parts 122, 124, and 136.

B. Introduction

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

1. Reasonable Potential

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

2. Antibacksliding

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

3. State Certification

Section 401(a)(1) of the CWA requires all NPDES permit applicants to obtain a certification from the appropriate state agency stating that the permit will comply with all applicable federal effluent limitation and state WQS.WQS See CWA § 401(a)(1). The regulatory provisions pertaining to state certification provide that EPA may not issue a permit until a certification is granted or waived by the state in which the discharge originates or certification is deemed to be

waived. 40 C.F.R. § 124.53(a). The regulations further provide that, "when certification is required…no final permit shall be issued…unless the final permit incorporated the requirements specified in the certification under § 124.53(e)." 40 C.F.R. § 124.55(a)(2). Section 124.53(e) in turn provides that the State certification shall include "any conditions more stringent than those in the draft permit which the State finds necessary" to assure compliance with, among other things, State WQS (see 40 C.F.R. § 124.53(e)(2)), and shall also include "[a] statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of State law, including water quality standards," see 40 C.F.R. § 124.53(e)(3).

However, when EPA reasonably believes that a State WQS requires a more stringent permit limitation than that reflected in a state certification, it has an independent duty under CWA §301(b)(1)(C) to include more stringent permit limitations. See 40 C.F.R. §§ 122.44(d)(1) and (5). 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." 40 C.F.R. § 124.55(c). In such an instance, the regulations provide 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 WQS and state requirements are contained in 40 C.F.R. § 122.4(d) and 40 C.F.R. § 122.44(d).

Sections 305(b) and 303(d) of the CWA require that states complete a water quality inventory and develop a list of impaired waters. Specifically, Section 303(d) of the CWA requires states to identify those water bodies that are not expected to meet WQS after the implementation of technology-based controls, and as such, require the development of a Total Maximum Daily Load (TMDL) for each pollutant that is prohibiting a designated use(s) from being attained. The results of the 305(b) assessments are used in the development of the State of New Hampshire's 303(d) lists, which are published every two years and identifies the water bodies which are not meeting (or are not expected to meet) WQS, identifies the designated use(s) which is impaired and also the pollutant(s) causing the impairment(s). When issuing NPDES permits to facilities which discharge to or upstream of impaired waters effluent limits may be no greater than the waste load allocation identified in the TMDL for that discharge. See generally 40 CFR §122.44 (d)(1)(vii).

4. Receiving Water Description

The Peterborough WWTF discharges treated effluent to the Contoocook River, which is classified by the State of New Hampshire as a Class B water. According to New Hampshire's WQS (RSA 485-A:8), "Class B waters shall be of the second highest quality and shall have no objectionable physical characteristics, and shall contain a dissolved oxygen content of at least 75 percent saturation"." The following designated uses are assigned to Class B waters: the protection and propagation of aquatic life and wildlife, for swimming and other recreational purposes; and, after treatment, for water supplies.

In 2012, the NHDES listed the receiving water segment (NHRIV700030104-17) as impaired and requiring a TMDL for pH as shown in **Table 1** on next page. One segment, NHRIV700030104-23, about one half mile downstream of the discharge, also has a dissolved oxygen impairment

that requires a TMDL. The New Hampshire Department of Environmental Services is working on a dissolved oxygen and nutrients TMDL for the Contoocook River from Peterborough to Antrim, but the release date is uncertain.

A statewide bacteria TMDL was approved by EPA on September 21, 2010. Consistent with NH WQS, the TMDL includes an instantaneous *E. coli* target of 406 colonies/100 ml or less and a geometric mean target of 126 colonies/100 ml. The draft permit includes limitations on *E. coli* that were developed to ensure that the Peterborough WWTF discharge complies with State WQS and the TMDL requirements.

Table 1. Impairments of Receiving Water and Downstream Segments.

Segment Number	Impairments	Source
NHRIV700030104-18 Contoocook River (receiving water segment) Upstream of Peterborough WWTF to Boglie Brook	pH, E. coli	Unknown
NHRIV700030104-23 Contoocook River from Boglie Brook Dam to Otter Brook	Dissolved Oxygen	Industrial Point Source Discharges Municipal Point Source Discharges
NHRIV700030106-08 Contoocook River from Otter Brook to Powder Mill	Aluminum, pH, E. coli,	Unknown (aluminum, pH), industrial and municipal point source discharges (E. coli)Unknown
NHLAK700030107-03 Powder Mill Pond	Dissolved oxygen, dissolved oxygen saturation, aluminum, non-native aquatic plants, chlorophyll-a	Municipal Point Sources (dissolved oxygen), remaining impairments - unknown

*all segments listed above are also impaired for mercury from atmospheric deposition.

5. Antidegradation

In accordance with the antidegradation provisions in NH WQS (Env-Wq 1708), proposed new or increased activity, such as an increase in pollutant loading, may only be allowed if existing uses and the level of water quality necessary to protect existing uses is maintained and protected and if significant degradation in water quality (where the quality of surface waters exceeds levels necessary to support designated uses) are limited to those necessary to accommodate important economic or social developments in the area in which the surface waters are located. Discharges that cause "Significant degradation" are defined in NH WQS (Env-Wq 1708.09(a)) as those that use 20% or more of the remaining assimilative capacity for a water quality parameter in terms of either concentration or mass of pollutants or flow rate for water quantity. Where DES determines that a proposed increase would cause a significant increase, the applicant must provide documentation to demonstrate that the lowering of water quality is necessary, will provide net economic or social benefits in the area in which the water body is located, and that the benefits of the activity outweigh the environmental impact caused by the lower water quality (see Env-WQ 1708.10(b)).

In 2011, DES evaluated the increase in discharge from the Peterborough WWTF from 0.5 MGD to 0.62 MGD. The evaluation assumed, based on information from the applicant, that the upgraded WWTF would provide improved treatment for biological oxygen demand, total suspended solids, ammonia and nutrients, and that these pollutant loads would not increase compared to the existing WWTF (see Appendix B, page 1). By letter of April 27, 2011 (See Appendix B), when the Peterborough WWTF upgrade was in progress, DES informed Peterborough that their increased discharge had the potential to result in a significant lowering of water quality in the Contoocook River with respect to aluminum, copper, lead, silver and cyanide unless concentrations were held to the "maximum allowable permit concentration to use less than 20% of remaining assimilative capacity (mg/L)" (see page 3 of Appendix B) and that DES would "provide the antidegradation calculations to EPA for their use in preparing Peterborough's next permit" (page 4 of Appendix B).

In this permit reissuance, the permittee is being granted authorization to discharge an increased flow of 0.62 mgd. As far as EPA is aware, the applicant has not provided the documentation necessary to demonstrate that a significant degradation is warranted under NH WQS antidegradation policy. Therefore, the effluent limits included in the draft permit are consistent with the pollutant load increases calculated by DES to ensure that the increased discharge results in no more than an insignificant degradation of water quality in the Contoocook River.

C. Effluent Flow

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

EPA may use design flow of effluent both to determine the necessity for effluent limitations in the permit that comply with the Act, and to calculate the limits themselves. EPA practice is to use design flow as a reasonable and important worst-case condition in EPA's reasonable potential and water quality-based effluent limitations (WQBEL) calculations to ensure compliance with WQS under Section 301(b)(1)(C). Should the effluent discharge flow exceed the flow assumed in these calculations, the instream dilution would decrease and the calculated effluent limits may not be protective of WQS. Further, pollutants that do not have the reasonable potential to exceed WQS at the lower discharge flow may have reasonable potential at a higher flow due to the decreased dilution. In order to ensure that the assumptions underlying the Region's reasonable potential analyses and derivation of permit effluent limitations remain sound for the duration of the permit, the Region may ensure its "worst-case" effluent wastewater flow assumption through imposition of permit conditions for effluent flow. Thus, the effluent flow limit is a component of WQBELs because the WQBELs are premised on a maximum level of flow. In addition, the flow limit is necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQS.

Using a facility's design flow in the derivation of pollutant effluent limitations, including conditions to limit wastewater effluent flow, is consistent with, and anticipated by NPDES permit regulations. Regarding the calculation of effluent limitations for POTWs, 40 C.F.R. §

122.45design flow." POTW permit applications are required to include the design flow of the treatment facility. *Id.* § 122.21(j)(1)(vi).

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

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

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

As described previously, the upgrade to the Peterborough WWTF has increased the facility's design capacity from 0.5 mgd to 0.62 mgd, which lowers the dilution factor. Several permit limits derived below are based upon the available dilution as discussed in Section V.E.1. of this fact sheet.

The average monthly effluent flow from the Peterborough WWTF from August 2012 through November 2014 ranged from 0.27 mgd to 0.51 mgd. The permit contains an effluent flow limit of 0.62 mgd, applied as a 12-month 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. Additionally, if the effluent flow rate exceeds 80 percent of the 0.62 mgd design flow (0.496 mgd) for a period of three (3) consecutive months, then the permittee must notify EPA and the NHDES-WD and implement a program to maintain satisfactory treatment levels.

D. Conventional pollutants

1. Five-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)

To prevent oxygen depletion in receiving waters, secondary treatment standards (see 40 CFR 133.102) require that all POTWs meet effluent limits for five-day biological oxygen demand (BOD_5) or carbonaceous BOD_5 ($CBOD_5$) and remove at least 85% of the BOD_5 or $CBOD_5$ that enters the treatment plant

The current permit includes BOD_5 concentration limits of 30 mg/L as a monthly average, 45 mg/L as a weekly average, and 50 mg/L as a daily maximum, which are based on secondary treatment requirements in 40 CFR 133.102(a)(1) and (2). The current permit also contains BOD_5 loading limits of 125 lbs/day as a monthly average, 188 lbs/day as a weekly average, and 209 lbs/day as a daily maximum based on the design flow and the concentration limits.

There were several BOD violations during January through March of each year in the review period. Because of the violations, the permittee has requested that its BOD_5 limit be changed to a $CBOD_5$ limit due to nitrification occurring during the BOD_5 test. Nitrification is the reaction of ammonia (NH_3) nitrogen with dissolved oxygen to produce nitrates and nitrites (NO_3 and NO_2), and $CBOD_5$ excludes these reactions. In a letter dated June 10, 2014, the permittee presented analytical results showing this to be the case (see **Appendix D**). EPA agrees, and has replaced the BOD_5 limits with $CBOD_5$ limits in the draft permit.

The secondary treatment standards for $CBOD_5$ are 25 mg/L average monthly, 40 mg/L average weekly, and 85% removal (see 40 CFR 133.102(a)(4)). The monthly average and weekly average concentration limits in the draft permit correspond to these standards. The maximum daily limit is retained to satisfy antibacksliding requirements. Since the receiving water is impaired for dissolved oxygen, the load limits in the proposed permit correspond to the previous design flow of 0.5 mgd in accordance with antidegradation requirements, which do not permit increased loads of pollutants for which there is no remaining assimilative capacity in the receiving water.

Loading Limit = Design flow (mgd) x Concentration (mg/L) x 8.34 (conversion factor)
Monthly Average Mass Loading: 0.5 mgd x 25 mg/L x 8.34 = 104 lbs/day
Weekly Average Mass Loading: 0.5 mgd x 40 mg/L x 8.34 = 167 lbs/day
Maximum Daily Loading: 0.5 mgd x 45 mg/L x 8.34 = 188 lbs/day

Because the activated sludge system has a shorter residence time, the monitoring frequency will increase to twice weekly 24-hour composite samples. A shorter residence time means that wastewater is treated more quickly, leading to higher effluent variability. In accordance with the provisions of 40 CFR § 133.102(a)(4)(iii), the draft permit requires that the 30-day average percent removal of $CBOD_5$ be no less than 85%.

2. Total Suspended Solids (TSS)

Secondary treatment standards require that all POTWs meet effluent limits for TSS. The monthly average and weekly average TSS concentrations must not exceed 30 mg/L and 45 mg/L,

respectively. Facilities must also remove at least 85% of the TSS present in the influent on a monthly basis.

The current permit contains TSS concentration limits of 30 mg/L as a monthly average, 45 mg/L as a weekly average, and 50 mg/L as a daily maximum. The current permit also contains TSS loading limits of 125 lbs/day as a monthly average, 188 lbs/day as a weekly average, and 209 lbs/day as a daily maximum. From August 2012 through November 2014, there were two exceedances in February 2014 of the maximum daily and average weekly concentration limits (see **Appendix A**).

The load limits for TSS in the draft permit are the same as the limits in the current permit, and therefore, are in accordance with antibacksliding and antidegradation requirements. The concentration limits correspond to the secondary treatment standards and remain 30 mg/L as a monthly average, 45 mg/L as a weekly average, and 50 mg/L as a daily maximum.

Because of the WWTF upgrade to activated sludge, with a shorter residence time, the monitoring frequency will increase to twice weekly 24-hour composite samples. In accordance with the provisions of 40 CFR § 133.102(b)(3), the draft permit requires that the 30-day average percent removal of TSS be no less than 85%.

3. pH

The limit for pH is based upon State Certification Requirements and RSA 485-A:8, which states that "[t]he pH range for said (Class B) waters shall be 6.5 to 8.0 except when due to natural causes." The current permit limits the effluent pH to a range of 6.0 to 8.0. The original pH minimum limit was 6.5, but EPA modified the limit to 6.0 after the permittee demonstrated that the revised pH range would not alter the natural pH of the receiving water. From August 2012 through November 2014, there were no exceedances of the pH limits (see **Appendix A**).

The effluent limitations for pH in the draft permit are 6.5 to 8.0, in accordance with the NHWQS. The permittee shall continue to monitor the pH of the effluent once per day.

Because the receiving water segment is listed as impaired for pH, a modified pH range is not currently allowed. However, the special condition in Part I.F. has been maintained in the draft permit and would allow for a change in the pH limitation when certain conditions are met, one of which is the absence of a pH impairment in the receiving water.

4. Escherichia coli (*E. coli*)

A statewide bacteria TMDL was approved by EPA on September 21, 2010. The TMDL includes an instantaneous *E. coli* target of 406 colonies/100 ml or less and a geometric mean target of 126 colonies/100 ml. The NH WQS specify that Class B waters "shall contain no more than either a geometric mean based on at least 3 samples obtained over a 60-day period of 126 Escherichia coli per 100 milliliters, or greater than 406 Escherichia coli per 100 milliliters in any one sample." (see RSA 485-A:8(II))

The current permit contains effluent limits of 126 *E. coli* colony forming units (cfu) per 100 mL, and a maximum daily limit of 406 cfu/100 mL. From August 2012 through November 2014, there were two exceedances of the *E. coli* maximum daily limit but no exceedances of the average monthly limit.

The *E. coli* limitations in the current permit have been maintained in the draft permit, in keeping with NH WQS and the bacteria TMDL. Because of the WWTF upgrade to activated sludge, which shortens wastewater residence time, the monitoring frequency in the draft permit increases to three times per week. The draft permit also requires *E. coli* samples to be collected concurrently with total residual chlorine samples.

E. Available Dilution, Non-conventional and Toxic Pollutants

Water quality based effluent limits for specific toxic pollutants were determined from numeric chemical specific criteria adopted by New Hampshire (refer to Env-Wq 1700) and approved by EPA. EPA uses these pollutant specific criteria along with available dilution in the receiving water to determine a pollutant specific draft permit limit.

1. Available Dilution

In accordance with New Hampshire's WQS (RSA 485-A:8 VI, Env-Wq 1705.02), the available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10 flow). The 7Q10 is used for aquatic life and human health criteria for non-carcinogens, while the long-term harmonic mean flow is used for human health (for carcinogens only) in the receiving water (see Env-Wq 1702.44). Furthermore, ten percent of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations (Env-Wq 1705.01).

The dilution factor for the facility is 12, based upon a 7Q10 flow just above the Peterborough treatment plant of 11.82 cfs. The 7Q10 at the Peterborough treatment plant was derived by adding the 7Q10 flows of the USGS gage on the Contoocook River in Peterborough (Gage No. 01082000) and the gage on Nubanusit Brook (Gage No. 01083000). The 7Q10 flows at these gages are 8.11 and 3.22 cfs, respectively. The Dingman equation was then used to calculate a 7Q10 flow of 0.49 cfs for the ungaged area. This flow was added to the 7Q10 from the gages to give a 7Q10 at the Peterborough treatment plant of 11.82 cfs (8.11 cfs + 3.22 cfs + 0.49 cfs = 11.82 cfs). The dilution factor calculation is shown below.

DILUTION FACTOR

7Q10 flow just upstream of the Peterborough treatment plant = 11.82 cfs or 7.64 mgd

Treatment plant design flow = 0.62 mgd

0.9 = Factor to reserve 10% of assimilative capacity.

Dilution Factor = (0.9) * Downstream 7Q10 / Design Flow

Dilution Factor = (0.9) * (7.64 mgd + 0.62 mgd) / 0.62 mgd = **12**

2. Total Residual Chlorine (TRC)

The acute and chronic aquatic life criteria for total residual chlorine specified in the New Hampshire WQS are 19 µg/L and 11 µg/L, respectively (see Env-Wq. 1703.21, Table 1703.1). The current permit contains monthly average and maximum daily TRC limits of 0.16 mg/L and 0.28 mg/L, respectively. From August 2012 through November 2014, there were no violations of the total residual chlorine limits (see DMR summary in Appendix A).

Due to the design flow increase, the TRC limits have been re-calculated to correspond to the new dilution factor.

Total Residual Chlorine Limitations:

(acute criteria * dilution factor) = Acute limit = (Maximum Daily)
(19 µg/L x 12) = 228 µg/L (0.23 mg/L)

(chronic criteria * dilution factor) = Chronic limit (Monthly Average)
(11 µg/L x 12) = 132 µg/L (0.13 mg/L)

The proposed limits are 0.13 mg/L as a monthly average, and 0.23 mg/L as a maximum daily. The proposed monitoring frequency is once per day.

3. Ammonia Nitrogen

High levels of ammonia in the water column can be toxic to fish by making it more difficult for fish to excrete this chemical via passive diffusion from gill tissues. Ammonia is more toxic at high pH and high temperature and can react with dissolved oxygen to produce nitrate/nitrate.

The current permit does not contain ammonia limits but does require annual monitoring as part of whole effluent toxicity (WET) testing. The effluent ammonia concentration from 2012 through 2014 ranged from below detection limit (0.1 mg/L) to 5.4 mg/L.

In the New Hampshire Surface Water Quality Regulations, acute criteria depend on pH and the presence or absence of salmonids, and chronic criteria vary with pH, temperature, and whether early life stages of fish are present. Because the Contoocook River is within Essential Fish Habitat for Atlantic salmon (*Salmo salar*), EPA will assume that salmonids could be present in the receiving water.

Ambient sampling conducted in 2006[1] by the NHDES indicates that the average pH for the Contoocook River upstream of the outfall is 6.7 s.u and the summer water temperature is 26 °C.

[1] NHDES. 2006 River Periphyton Study Data. New Hampshire Department of Environmental Services, Watershed Mgmt Bureau-Water Quality Planning, Concord, NHH.

Therefore, according to NH Env-Wq. Table 1703.4, the summer ammonia criteria are 29.8 mg/L acute and 3.07 mg/L chronic. The chronic winter ammonia criterion is 6.44 mg/L, at a temperature of 10 °C and pH 6.7. Ammonia has not been detected upstream of the discharge during WET testing, but it was detected at low levels (median = 0.06 mg/L) in four samples collected for the antidegradation analysis.

Reasonable Potential Analysis

$$C_R = \frac{Q_D C_D + Q_S C_S}{Q_R}$$

Where

C_R = Downstream ammonia concentration
Q_D = Facility's design flow = 0.62 mgd
C_D = Facility's maximum effluent ammonia concentration = 5.4 mg/L
Q_S = Downstream receiving water 7Q10 flow = 7.64 mgd + 0.62 = 8.26 mgd
C_S = Median upstream ammonia concentration = 0.06 mg/L
Q_R = Upstream 7Q10 flow = 7.64 mgd

Therefore,

$$C_R = \frac{(0.62 \text{ MGD} \times 5.4 \text{ mg/L}) + (7.64 \text{ mgd} \times 0.06 \text{ mg/L})}{8.26 \text{ mgd}}$$

= 0.46 mg/L < 2.76 mg/L (chronic criteria x 0.9)

As the calculation above shows, there is no reasonable potential for ammonia in the effluent to cause or contribute to an excursion from WQS. However, antidegradation requirements still apply.

Antidegradation Analysis

The antidegradation analysis requires that Peterborough WWTF hold its ammonia loading to pre-upgrade levels, which it determined to be 75 lbs/day. NHDES based this load estimate on the facility's DMR data and 8 samples collected for the antidegradation study.

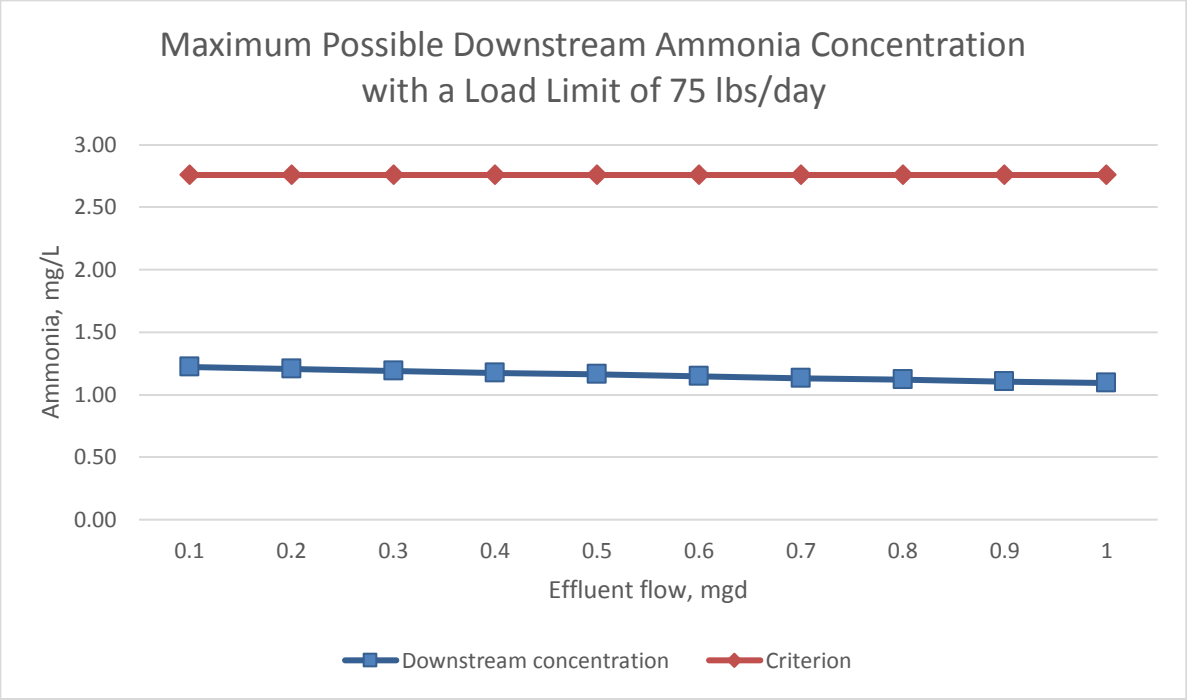
The draft permit contains seasonal ammonia limits applicable from June 1 through October 31 of each year. The average monthly load limit from June 1 through October 31 in the draft permit is 75 lbs/day, and report-only from November 1 through May 31. From June 1 through October 31, proposed monitoring frequency will be once per week. From November 1 through May 31, the monitoring frequency will be once per month.

EPA considered whether loading limits alone would be protective during low effluent flow conditions. A permittee with only a load limit could discharge high concentrations of a pollutant when effluent flow is low. As effluent flow rates increase, the concentration of the pollutant

required to meet the load limit decreases. See **Figure 3**, showing the inverse relationship between ammonia concentrations and effluent flow rate at the proposed load limit (75 lbs/day).

As **Figure 3** shows, there is no reasonable potential for the Peterborough discharge to cause or contribute to an exceedance of the water quality criteria for ammonia, regardless of the flow rate, provided that it is in compliance with the loading limit. For this reason, the antidegradation ammonia limit in the draft permit is expressed in terms of load only.

Figure 3. Evaluation of the need for a concentration-based ammonia limit under various effluent scenarios.



4. Total Phosphorus

Phosphorus and other nutrients (i.e. nitrogen) can promote the growth of nuisance algae and rooted aquatic plants. Typically, elevated levels of nutrients will cause excessive algal and/or plant growth resulting in reduced water clarity and poor aesthetic quality. Through respiration and the decomposition of dead plant matter, excessive algae and plant growth can reduce in-stream dissolved oxygen concentrations to levels that could negatively impact aquatic life and/or produce strong unpleasant odors.

The New Hampshire Surface Water Quality Regulations contain a narrative criterion which limits phosphorus to the level that will not impair a water body's designated use. Specifically, Env-Wq 1703.14(b) states that, "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring." Env-Wq 1703.14(c), further states that, "Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards." Cultural eutrophication is defined in Env-Wq 1702.15 as, "… the human-induced addition of wastes

containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen." Although numeric nutrient criteria have not yet been developed in New Hampshire, a total phosphorus concentration of 0.05 mg/L is considered by NHDES as a level of concern (NH Volunteer River Assessment Program).

EPA has produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The 1986 Quality Criteria of Water (Gold Book) recommends instream phosphorus concentrations of 0.05 mg/L in any stream entering a lake or reservoir, 0.1 mg/L for any stream not discharged directly to lakes or impoundments, and 0.025 mg/L within a lake or reservoir.

In December 2000, EPA released "Ecoregional Nutrient Criteria" (USEPA 2000), which were established as part of an effort to reduce problems associated with excess nutrients in water bodies located within specific areas of the country. The published criteria represent conditions in waters within each specific ecoregion that are minimally impacted by human activities, and thus are representative of waters without cultural eutrophication. Peterborough is within Ecoregion VIII, Nutrient Poor Largely Glaciated Upper Midwest and Northeast. Recommended criteria for this ecoregion is a total phosphorus criterion of 10 µg/L (0.010 mg/L) and chlorophyll a criteria of 0.63 µg/L (0.00063 mg/L). These recommended criteria are found in the Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII (USEPA 2001).

EPA has decided to apply the Gold Book criterion rather than the more stringent ecoregional criteria, given that it was developed from an effects-based approach versus the ecoregional criteria that were developed on the basis of reference conditions. The effects-based approach is taken because it is more directly associated with an impairment to a designated use (i.e. fishing, swimming). The effects-based approach provides a threshold value above which adverse effects (i.e. water quality impairments) are likely to occur. It applies empirical observations of a causal variable (i.e. phosphorus) and a response variable (i.e. chlorophyll a) associated with designated use impairments. Reference-based values are statistically derived from a comparison within a population of rivers in the same ecoregional class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

The current permit contains a monthly average total phosphorus limit of 0.93 mg/L from April 1 through October 31 and 1.0 mg/L from November 1 through March 31. From August 2012 through November 2014, there was one violation in January 2014, when the monthly average total phosphorus was 1.15 mg/L.

The antidegradation analysis suggests a concentration limit of 0.75 mg/L to hold the current permitted phosphorus load to the same level as before the flow increase, 3.88 lbs/day. This limit will be applied as a mass-based limit and is consistent with the NHDES antidegradation analysis.

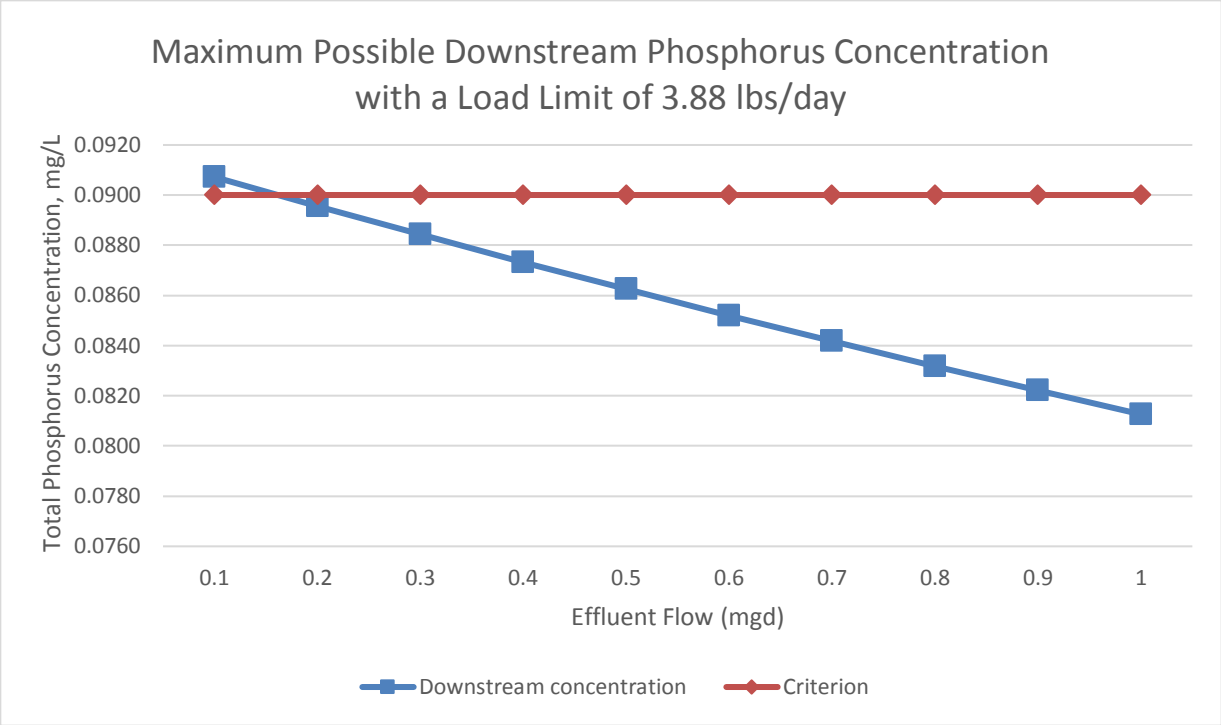
Current Loading = Design flow (mgd) x Concentration (mg/L) x 8.34 (conversion factor)
Current Monthly Average Mass Loading: 0.5 mgd x 0.93 mg/L x 8.34 = 3.88 lbs/day

From April through October, the draft permit includes a monthly average limit of 3.88 lbs/day, and a requirement to report average monthly and maximum daily concentrations. This limit is in

accordance with antibacksliding requirements because the load limit is just as protective of water quality at typical effluent flows as the previous summer limit of 0.93 mg/L.

Figure 4 shows that at effluent flows higher than 0.15 mgd, the load limit of 3.88 lbs/day prevents downstream phosphorus concentrations from causing a violation of WQS. The lowest average monthly flow reported by the Peterborough WWTF during the last 5 years was 0.27 mgd, and therefore the load limit is sufficient to protect downstream uses.

Figure 4. Evaluation of the need for a concentration-based phosphorus limit under various effluent scenarios.



From November through March, the total phosphorus limit will continue to be 1 mg/L. A winter loading limit of 4.17 lbs/day has been included in the draft permit as well. In accordance with antidegradation requirements, the loading limit is calculated with the previous design flow of 0.5 mgd to ensure that phosphorus loading does not increase because of the higher design flow.

Current Winter Loading = Design Flow (mgd) x Concentration (mg/L) x 8.34
= 0.5 mgd x 1 mg/L x 8.34
= 4.17 lbs/day

<u>Orthophosphorus</u>

The current permit requires monitoring for dissolved phosphorus (also known as orthophosphorus) from November through March. The purpose of this requirement is to determine the fractions of dissolved and particulate phosphorus discharged from the Peterborough WWTF in winter. The monitoring is part of a larger effort to determine the transport and ultimate fate of winter phosphorus discharges from POTWs in New England, especially with respect to downstream impoundments.

Orthophosphorus monitoring data from the two most recent winters (see **Table 2**) show that most of the Peterborough effluent phosphorus is in the particulate form, ranging from 69% to 93% particulate. January 2014 was the only exception from this pattern, with 11% particulate phosphorus[2]. Total phosphorus ranged from 0.14 mg/L to 1.15 mg/L, with a mean of 0.33 mg/L, while orthophosphorus ranged from 0.01 mg/L to 1.01 mg/L with a mean of 0.14 mg/L. For the purpose of this analysis, it is assumed that all phosphorus in non-orthophosphorus form is particulate.

Table 2. Winter Orthophosphate Monitoring Results for Peterborough WWTF

Monitoring Period Ending Date	Total Phosphorus (mg/L)	Ortho-phosphorus (mg/L)	% Orthophosphorus	% Particulate
11/30/2012	0.14	0.03	21.4	78.6
12/31/2012	0.14	0.044	31.4	68.6
01/31/2013	0.38	0.027	7.1	92.9
02/28/2013	0.18	0.028	15.6	84.4
03/31/2013	0.14	0.01	7.1	92.9
11/30/2013	0.14	0.029	20.7	79.3
12/31/2013	0.26	0.06	23.1	76.9
01/31/2014	1.15	1.013	88.1	11.9
02/28/2014	0.54	0.063	11.7	88.3
03/31/2014	0.26	0.051	19.6	80.4

Winter phosphorus discharges have been shown to accumulate in impoundments during the winter months, possibly leading to excessive algal growth in the summer (US Army Corps of Engineers, 2010[3]; USGS, 2011[4]). Powder Mill Pond, located in Hancock, New Hampshire, is an impoundment on the Contoocook River downstream of the Peterborough WWTF. Available water quality data indicate that Powder Mill Pond may be impaired for nutrients. The pond is not assessed for phosphorus, but is listed as impaired for dissolved oxygen concentration, dissolved oxygen saturation, non-native aquatic plants, and chlorophyll-a (see Table 1 in Section V.B.4.).

The draft permit includes a requirement that the permittee monitor Powder Mill Pond for eutrophication indicators. The monitoring will begin in the summer season following 36 months after the effective date of the permit and will continue for a total of three summer seasons. From July through September, the permittee will collect the following data once per month just above the impoundment:

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[2] Total phosphorus in January 2014 (1.15 mg/L) was also more than twice as high as the second highest measurement (0.54 mg/l), which suggests that this month's measurements were an aberration.

[3] United States Army Corps of Engineers, New England District, 2010, Assabet River, Massachusetts Sediment and Dam Removal Feasibility Study. Retrieved from http://www.nae.usace.army.mil/Portals/74/docs/Topics/Assabet/FeasibilityStudy.pdf

[4] Zimmerman, M.J., Yu Qian, and Tian Yong Q., 2011, Monitoring to assess progress toward meeting the Assabet River, Massachusetts, phosphorus total maximum daily load—Aquatic macrophyte biomass and sediment-phosphorus flux: U.S. Geological Survey Scientific Investigations Report 2011–5179, 77 p. (Also available at http://pubs.usgs.gov/sir/2011/5179/.)

- Dissolved oxygen (saturation and concentration), temperature, and pH for one 24-hour period using dataloggers;
- Instantaneous dissolved oxygen (saturation and concentration) and temperature profile at 0.5-meter depth intervals; and
- Total phosphorus and chlorophyll-a.

The sampling program shall be in accordance with the NHDES Volunteer River Assessment Program Quality Assurance Project Plan wherever possible. EPA will use the data from Powder Mill Pond to assess the condition of this downstream receiving water and evaluate the need for greater control of phosphorus loads from the Peterborough WWTF at the next permit reissuance.

5. Metals

Introduction

WQBELs for metals in the draft permit were derived by considering both the reasonable potential for exceedance of water quality criteria and the antidegradation conditions established by NHDES as a condition of their approval of the WWTF flow increase sans the demonstrations regarding social and economic benefit that would otherwise be required.

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

However, many inorganic components of domestic wastewater, including metals, are in the particulate form. Differences in the chemical composition between the effluent and the receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]). Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Regulations at 40 CFR 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals.

Water Quality Criteria

For metals with hardness-based water quality criteria, EPA determined the criteria using the equations in NH standards Env-Wq 1703.24 (see table below). The downstream hardness was calculated to be 17 mg/L as $CaCO_3$, using a mass balance equation with the design flow,

receiving water 7Q10, an upstream median hardness of 15 mg/L as $CaCO_3$ and an effluent median hardness of 45 mg/L as $CaCO_3$.

Hardness Mass Balance

$$C_R = \frac{Q_D C_D + Q_S C_S}{Q_R}$$

Solving for C_R (receiving water concentration), where

Q_D = effluent flow, i.e. facility design flow = 0.62 mgd
C_D = effluent hardness = 45 mg/L
Q_S = 7Q10 flow of receiving water = 7.64 cfs
C_S = upstream hardness = 15 mg/L
Q_R = receiving water flow = $Q_S + Q_D$ = 7.64 mgd + 0.62 mgd = 8.26 mgd

$$C_R = \frac{(0.62 \text{ mgd} \times 45 \text{ mg/l}) + (7.64 \text{ mgd} \times 15 \text{ mg/L})}{8.26 \text{ mgd}}$$

C_R = **17.25 mg/L**, which defaults to **25 mg/L** (downstream hardness for calculation of certain hardness based metal criteria)

The NH Standards Env-Wq 1703.22(f) require that for waters with hardness below 25 mg/L, the hardness value used to calculate water quality criteria must be 25 mg/L.
Table 3 on page 23 presents the factors used to determine the acute and chronic total recoverable criteria for each metal.

Although water quality criteria for most metals are presented as either dissolved or total recoverable, in a letter from NHDES to EPA (dated July 1, 2014), NHDES clarified that the aluminum criteria presented in the New Hampshire water quality regulations (Env-Wq-1700) should be applied in terms of acid-soluble aluminum. The letter goes on to say

> *New Hampshire's aluminum criteria are based on EPA's 1988 ambient water quality criteria document for aluminum[5]. According to this document, acid-soluble aluminum is operationally defined as "[a]luminum that passes through a 0.45 um membrane filter after the sample has been acidified to a pH at between 1.5 and 2.0 with nitric acid." [6] For the many reasons listed in the "Implementation" section of the EPA document, acid-soluble aluminum is considered a better measurement of the forms that are toxic to aquatic life or that can be readily converted to toxic forms under natural conditions.*

For the purpose of developing WQBELs for aluminum in NH NPDES permits, EPA assumes that all of the aluminum in the receiving water and in the effluent is acid soluble, unless there is

[5] Ambient Water Quality Criteria for Aluminum - 1988. United Stated Environmental Protection Agency. EPA 440/5-86-008. August 1988.
[6] DES protocols require the sample to be acidified to this low pH and allowed to stand for l6 hours before analysis.

site specific data available indicating otherwise. So far, EPA is not aware of any site specific data regarding the fraction of soluble aluminum in the Contoocook River, in the vicinity of the Peterborough WWTF or in the Peterborough WWTF effluent. Therefore, for the purposes of this draft permit, EPA assumes that the ratio of acid soluble to total recoverable aluminum is 1. The NH fresh water acute and chronic criteria for aluminum are 750 µg/L and 87 µg/L, respectively.

Table 3. Metals Water Quality Criteria in the Contoocook River (Hardness = 25 mg/L).

	Total Dissolved Metals Criteria		Conversion Factor	Total Recoverable Metals Criteria = Dissolved Criterion/ Conversion Factor
Parameter	**Criteria Type**	**Criteria (µg/L)**		
Cadmium	Acute	0.95	1.136672 – [(LnHardness)(0.041838)] = 1.00	0.95 µg/L
	Chronic	0.8	1.101672- [(LnHardness)(0.041838)] = 0.967	0.83 µg/L
Copper	Acute	3.6	0.960	3.75 µg/L
	Chronic	2.7		2.81 µg/L
Lead	Acute	14	1.46203- [(LnHardness)(0.145712)] = 0.993	14.1 µg/L
	Chronic	0.54		0.543 µg/L
Nickel	Acute	144.9	0.998	145.2 µg/L
	Chronic	16.1	0.997	16.15 µg/L
Silver	Acute	0.32	0.85	0.376 µg/L
Zinc	Acute	36.2	0.978	37.3 µg/L
	Chronic	36.5	0.986	36.7 µg/L

* The aluminum water quality criteria in NH's WQS are expressed as acid-soluble, and therefore are not included in this table.

Reasonable Potential Analysis and Effluent Limit Determination

Effluent data collected for the 2011 antidegradation analysis and WET tests from 2012 to 2014 were used to determine reasonable potential for toxicity caused by aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

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

$$Q_R C_R = Q_D C_D + Q_s C_s$$

Can be rewritten as:

$$C_R = \frac{Q_D C_D + Q_S C_S}{Q_R}$$

where:

Q_D	=	Facility's design flow = 0.62 mgd
C_D	=	Effluent metals concentration in µg/L (maximum observed)
Q_S	=	Upstream receiving water 7Q10 flow = 7.64 mgd
C_S	=	Background in-stream metals concentration in µg/L (median)
Q_R	=	Downstream 7Q10 flow = 7.64 mgd + 0.62 = 8.26
C_R	=	Resultant in-stream concentration in µg/L

Reasonable potential is then determined by comparing this resultant in-stream concentration (for both acute and chronic conditions) with the criteria for each metal multiplied by the factor 0.9 to reserve 10% assimilative capacity. If there is reasonable potential (for either acute or chronic conditions), the appropriate limit is then calculated by rearranging the above mass balance to solve for the effluent concentration (C_D) using the criterion times 0.9 as the resultant in-stream concentration (C_R). See **Table 6. Metals Reasonable Potential Summary** on page 29 for the results of this analysis with respect to aluminum, cadmium, copper, lead, nickel and zinc.

As **Table 6** shows, there is reasonable potential for the discharge to cause excursions from WQS for lead. Because the background concentrations in the Contoocook River and in the effluent both exceed the chronic criteria for lead, there is no remaining assimilative capacity.

Antidegradation Effluent Limits

Because the effluent data set was small (i.e, less than 10), DES performed a statistical analysis to determine whether the increase in effluent flow could cause significant degradation of the receiving water[7]. Using a method from the Technical Support Document for Water Quality-based Toxics Control (TSD), DES calculated a projected 99th-percentile upper bound for each effluent metal concentration based on the maximum measured concentration multiplied by a reasonable potential multiplication factor found in the TSD, Table 3-1. See **Appendix C** for the details of this statistical derivation. The resulting effluent concentration for each metal was put into the same mass balance described above and compared to the respective criteria[8]. **Table 4. NHDES Antidegradation Study Results** shows the results of the Peterborough WWTF antidegradation evaluation.

[7] As discussed in Section V.B.5 of this fact sheet, degradation is considered "significant" when a proposed discharge or activity uses 20% or more of the remaining assimilative capacity for a water quality parameter. See NH standards Env-Wq 1708.09.

[8] The most sensitive aquatic life or human health criteria for each pollutant was used in this evaluation.

Table 4. NHDES Antidegradation Study Results

Peterborough WWTF Antidegradation Study Results for Proposed Increased Discharge to the Contoocook River						
Parameter	Number of Effluent Samples "n"	Max. Measured Effluent Conc. (µg/L)	TSD Table 3.1 Multiplication Factor	Max Value x Multiplication Factor	Maximum Allowable Permit Concentration to use less than 20% of Remaining Assimilative Capacity (µg/L)	Antidegradation Limit Needed?
Aluminum (chronic)	4	70	4.7	329	109	**yes**
Antimony (chronic)	4	0.5	4.7	2.35	3530	no
Arsenic (fish cons.)	4	1.3	4.7	6.11	*	*
Arsenic (chronic)	4	1.3	4.7	6.11	310	no
Beryllium (chronic)	4	0.5	4.7	2.35	9	no
Cadmium (chronic)	4	0.1	4.7	0.47	1.6	no
Chromium (chronic)	4	1.6	4.7	7.52	61	no
Copper (chronic)	4	6.2	4.7	29.14	7.3	**yes**
Lead (chronic)	4	1.3	4.7	6.11	1.2	**yes**
Mercury (fish cons.)	4	0.0079	4.7	0.03713	0.072	no
Mercury (chronic)	4	0.0079	4.7	0.03713	2	no
Nickel (chronic)	4	3.1	4.7	14.57	36	no
Selenium (chronic)	4	0.5	4.7	2.35	8	no
Silver (acute)	4	0.4	4.7	1.88	0.63	**yes**
Thallium (fish cons.)	4	0.5	4.7	2.35	11	no
Zinc (chronic)	4	7.5	4.7	35.25	67	no
Total Cyanide (chronic)	4	16	4.7	75.2	5.2	**yes****

The antidegradation review found that the "increased discharge has the potential to result in a significant lowering of water quality in the Contoocook River with respect to aluminum, copper, lead, [and] silver" (see Appendix B). The report also recommended a monitoring requirement for arsenic. The recommended metals limits from the antidegradation analysis are shown in **Error! Reference source not found.** below. The load limits below are calculated using the following equation:

Loading (lbs/day) = Concentration (mg/L) x Effluent Flow (0.62 mgd) x 8.34 (conversion factor)

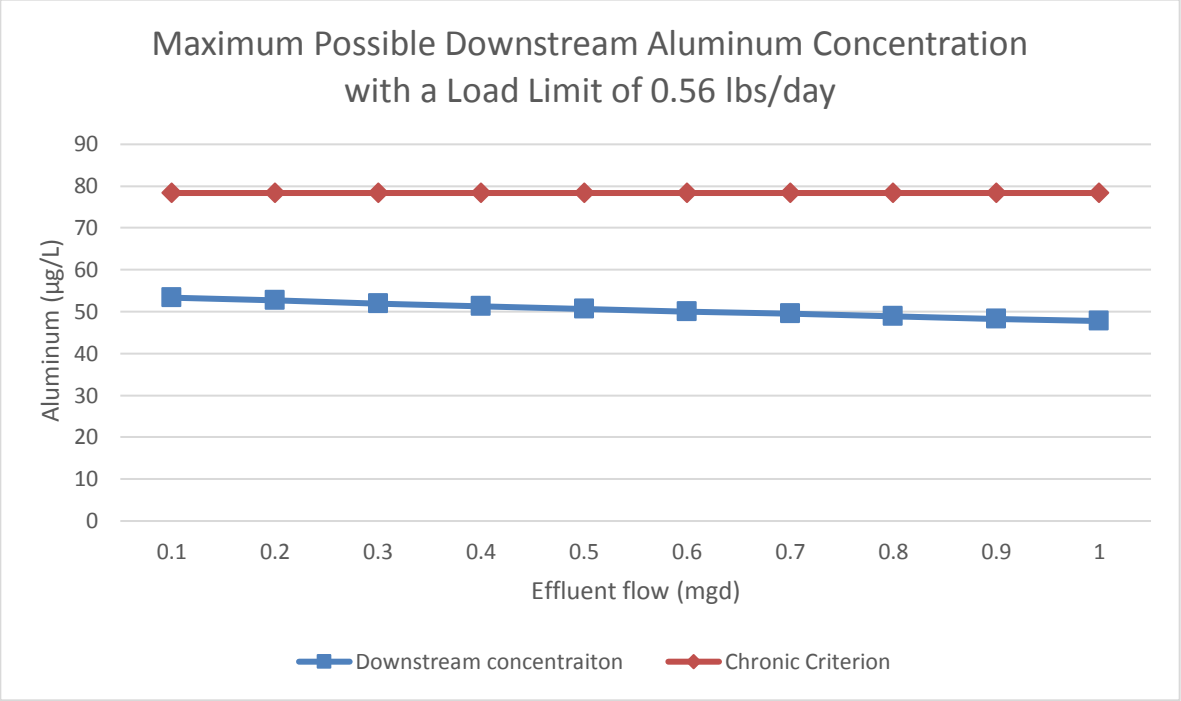
The "maximum allowable permit concentrations" from the antidegradation analysis are applied as loading limits in the draft permit. This conversion is based on the design flow of 0.62 mgd and the calculations are presented in **Table 5**. The use of loading limits, as opposed to concentration limits, will focus antidegradation controls on these increased discharges, while avoiding excessively stringent limits at lower effluent flows.

Table 5. Permit Limits from Antidegradation Analysis

Parameter	Recommended Concentration Limit	Corresponding Load-based Limit (assuming 0.62 mgd flow)
Aluminum (chronic)	109 µg/L	0.56 lbs/day
Copper (chronic)	7.3 µg/L	0.038 lbs/day
Lead (chronic)**	1.2 µg/L	0.0062 lbs/day
Silver (acute)	0.63 µg/L	0.0033 lbs/day
Arsenic (fish concentration)	Monitoring recommended	N/A
Zinc (chronic)†	67 µg/L	0.35 lbs/day

EPA considered whether loading limits alone would be protective during low effluent flow conditions. A permittee with only a load limit could discharge high concentrations of a pollutant when effluent flow is low. As effluent flow rates increase, the concentration of the pollutant required to meet the load limit decreases. **Figure 5** shows the inverse relationship between aluminum concentrations and effluent flow rate at the proposed load limit (0.56 lbs/day), and that downstream aluminum concentrations stay below the chronic criterion if the permittee is meeting the load limit. For this reason, the antidegradation metals limits in the draft permit are expressed in load only. The only exception is lead, where there is reasonable potential and thus a water quality based concentration limit is required.

Figure 5. Evaluation of the need for a concentration-based aluminum limit under various effluent scenarios.



† Zinc note: The original antidegradation analysis did not recommend a zinc limit because the maximum effluent concentration was 7.5 µg/L, lower than the concentration threshold of 67 µg/L to use less than 20% RAC. However, more recent effluent data from WET tests (see Appendix A) shows zinc concentrations ranging from 68 µg/L to 79 µg/L. Because this exceeds the threshold for using less than 20% RAC, the draft permit includes effluent limitations for zinc based on antidegradation.

Lead note: The lead limit based on antidegradation (to preserve 20% RAC) is superseded by more recent data showing that there is actually no RAC available in the river. The upstream lead concentrations from September 2012 through September 2014 ranged from 0.6 µg/L to 0.7 µg/L, exceeding the chronic aquatic life criterion of 0.54 µg/L. Effluent concentrations are also above the lead criterion, ranging from 4 µg/L to 11 µg/L in the same time period. Therefore, the lead limits in the draft permit are equal to the water quality criteria for lead. See **Table 6. Metals Reasonable Potential Summary on page 28.

Lead Compliance Schedule and Interim Limit

Because the lead limit in the proposed permit is lower than the current facility performance, it is likely that the facility will need to upgrade or optimize the treatment process to comply with the permit. Therefore, EPA is proposing a 48-month compliance schedule to allow the Town to prepare for the lead permit limit. The draft permit contains an interim lead limit of 5 µg/L that will be in effect during the 48-month compliance schedule.

6. Cyanide

Compounds containing the cyanide group (CN) are used and readily formed in many industrial processes and can be found in a variety of effluents, such as those from steel, petroleum, plastics, synthetic fibers, metal plating, and chemical industries. Cyanide occurs in water in many forms, including: hydrocyanic acid (HCN), the cyanide ion (CN-), simple cyanides, metallocyanide complexes, and as organic compounds. "Free Cyanide" is defined as the sum of the cyanide present as HCN and CN-. "Available" cyanide includes free cyanide plus those cyanide forms that can readily disassociate to release free cyanide. The relative concentrations of these forms depend mainly on pH and temperature. Currently, EPA has approved analytical methods for total, available, and free cyanide in water. Total cyanide includes all the forms of cyanide.

Both HCN and CN- are toxic to aquatic life. However, the vast majority of free cyanide usually exists as the more toxic HCN. And, since CN- readily converts to HCN at pH values that commonly exist in surface waters, EPA's cyanide criteria are stated in terms of free cyanide expressed as CN-. Free cyanide is a more reliable index of toxicity to aquatic life than total cyanide because total cyanides can include nitriles (organic cyanides) and relatively stable metallocyanide complexes.

Historically, cyanide has not been a monitored parameter at the Peterborough WWTF. However, the antidegradation study done for the facility's flow increase found this chemical in both the effluent and upstream in the Contoocook River at average concentrations of 12 µg/L and 16 µg/L total cyanide, respectively.

The levels of total cyanide are above the New Hampshire freshwater aquatic life chronic criterion for free cyanide, 5.2 µg/L. Because both the upstream and effluent contain total cyanide in excess of the water quality criteria, the NHDES recommended a cyanide limit of 5.2 µg/L in the permit. Although the antidegradation analysis used total cyanide analysis, the effluent limits in the draft permit are for free cyanide to more accurately reflect the toxic fraction of cyanide in the effluent and Contoocook River. Since no information is currently available regarding the ratio of free cyanide to total cyanide in the receiving water, EPA assumes that the ratio is 1.

The draft permit includes a free cyanide limit of 5.2 µg/L with a monitoring frequency of once per month.

Table 6. Metals Reasonable Potential Summary

Metal	Q_D	C_D (Highest Observed)	Q_S	C_S (Median)	$Q_R = Q_S + Q_D$	$C_R = (Q_D C_D + Q_S C_S)/Q_R$	Criteria * 0.9		Reasonable Potential	Effluent Conc. = $(Q_R C_R * 0.9 - Q_S C_S)/Q_D$	
	mgd	µg/L	mgd	µg/L	mgd	µg/L	Acute (µg/L)	Chronic (µg/L)	Cr > Criteria	Acute (µg/L)	Chronic (µg/L)
Aluminum	0.62	110	7.64	54	8.26	58.2	675	78.3	N	N/A	N/A
Cadmium		0		0		N/A	0.86	0.75	N	N/A	N/A
Copper		14		0.9		1.88	3.38	2.53	N	N/A	N/A
Lead		11		0.6		1.381	12.69	0.49	Y	161.67	0.54*
Nickel		3.1		0		0.23	130.67	14.53	N	N/A	N/A
Zinc		79		3		8.7	33.57	33.04	N	N/A	N/A
Silver		0.4		0.1		0.03	0.34	N/A	N	N/A	N/A

* Because the effluent and the instream concentrations exceed the chronic criteria for lead, the limit is set at the criteria of 0.54 µg/L.

7. Whole Effluent Toxicity (WET)

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

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts and New Hampshire law states that, "all waters shall be free from toxic substances or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life;...." (NH RSA 485-A:8, VI and NH Code of Administrative Rules, Part Env-Wq 1703.21). The federal NPDES regulations found at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when reasonable potential exists for a discharge to cause or contribute to an excursion above state narrative criteria for toxicity. Furthermore, the results of toxicity tests may be used to demonstrate compliance with the "no toxics in toxics amounts" requirement found in both the CWA and in the State of New Hampshire's regulations.

The current permit requires that WET testing be conducted once each year using the daphnid, *Ceriodaphnia dubia* (*C. dubia*) and the fathead minnow, *Pimephales promelas* (*P. promelas*) as the test organisms and required that the $LC_{50} \geq 100$ % effluent. Peterborough WWTF has met the acute toxicity limit for the last three years (2012 – 2014).

EPA-Region 1's current policy requires toxicity testing in all municipal permits with the type of toxicity test (acute and/or chronic) and effluent limitation based on a range of available dilution. EPA-Region 1's policy requires that secondary treatment facilities with a dilution factor between 10 and 20 meet an acute (LC50) toxicity limit of 100 percent effluent and report the chronic-no observed effect concentration (C-NOEC).

The LC50 is defined as the percentage of effluent lethal to 50% of the test organisms during a specific length of time. In other words, 50 percent of the test organisms must survive in a sample of 100 percent effluent. This limit is the same as in the 2007 permit.

The permittee shall conduct WET testing once annually, during the calendar quarter ending September 30. The draft permit requires separate acute and chronic toxicity tests; the modified acute test is no longer valid. The test results must be submitted to EPA and NHDES no later than the 15th day following the end of the quarter.

8. Additional Analyses

Certain metals that may be present in the effluent discharged from POTWs can be toxic to aquatic life. Acute and chronic freshwater criteria for these metals are shown in **Table 33** (also see the New Hampshire WQS at Env-Wq 1703.21, Table 1703.1). The results of metals analyses conducted on samples of the effluent in conjunction with WET tests from 2012 - 2014 are shown in **Appendix A**.

The current permit requires annual reporting of the following parameters in the effluent: ammonia nitrogen, hardness, aluminum, cadmium, chromium, copper, lead, nickel, and zinc. These analyses are conducted at the same time as the WET tests.

The draft permit continues a requirement for the reporting of several selected parameters, with the exception of chromium, which was removed from the list of required parameters to be monitored during WET tests.

If toxicity is found and persists in the effluent, the monitoring frequency and testing requirements may be increased. The permit may also be modified, or alternatively revoked and reissued, to incorporate additional toxicity testing requirements or chemical specific limits. These actions will occur if the Regional Administrator determines the NH standards are not adequately enforced and users of the receiving water are not adequately protected during the remaining life of the permit. Results of these toxicity tests are considered "new information not available at the permit development"; therefore, the permitting authority is allowed to use said information to modify an issued permit under the authority in 40 CFR §122.62(a)(2).

VI. SLUDGE

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

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

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

VII. INDUSTRIAL USERS

There is one industrial user that contributes flow to the Peterborough WWTP: New Hampshire Ball Bearings (NHBB). NHBB discharges 9,631 gallons per day (gpd) of process wastewater and 29,580 gpd of non-process wastewater. Both flows are continuous. NHBB is subject both to local limits and categorical pretreatment standards under 40 CFR 433 Metal Finishing Source Category.

The permittee is presently not required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR §403 and Section 307 of the CWA. However, the draft permit contains conditions that are necessary to allow EPA and the State of New Hampshire to ensure that pollutants from industrial users will not pass through the facility and cause violations of WQS in the receiving water, sludge use and disposal difficulties or cause interference with the operation of the treatment facility. The permittee is required to notify EPA and the State of New Hampshire whenever a process wastewater discharge to the facility from a primary industrial category is planned, (see 40 CFR §122 Appendix A for list) or if there is any substantial change in the volume or character of pollutants being discharged into the facility by a source that was discharging at the time of issuance of the permit. The permit also requires the permittee to: (1) report to EPA and NHDES the name(s) of all Industrial Users subject to Categorical Pretreatment Standards under 40 CFR §403.6 and 40 CFR Chapter I, Subchapter N (Parts 405-415, 417-436, 439-440, 443, 446-447, 454-455, 457-461, 463-469, and 471 as amended) who commence discharge to the POTW after the effective date of the permit, and (2) submit to EPA and NHDES copies of Baseline Monitoring Reports and other pretreatment reports submitted by industrial users.

VIII. OPERATION AND MAINTENANCE

The entire Peterborough WWTF collection system consists of separate sanitary sewers. Information provided in the permittee's re-application states that the facility serves a population of approximately 1,174.

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

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

the permit which has a reasonable likelihood of adversely affecting human health or the environment."

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

IX. ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104267), established a new requirement to describe and identify (designate) "essential fish habitat" (EFH) in each federal fishery management plan. Only species managed under a federal fishery management plan are covered.

Fishery Management Councils determine which area will be designated as EFH. The Councils have prepared written descriptions and maps of EFH, and include them in fishery management plans or their amendments. EFH designations for New England were approved by the Secretary of Commerce on March 3, 1999.

The 1996 Sustainable Fisheries Act broadly defined EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Waters include aquatic areas and their associated physical, chemical, and biological properties. Substrate includes sediment, hard bottom, and structures underlying the waters. Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers all habitat types utilized by a species throughout its life cycle. Adversely affect means any impact which reduces the quality and/or quantity of EFH. Adverse impacts may include direct (i.e. contamination, physical disruption), indirect (i.e. loss of prey), site specific or habitat wide impacts including individual, cumulative, or synergistic consequences of actions.

According to the National Marine Fisheries Service (NMFS), the Merrimack River, to which the Contoocook River is tributary, is EFH for Atlantic salmon (*Salmo salar*). Based on discussions with the New Hampshire Fish and Game Department, no Atlantic salmon fry are presently stocked in any section of the Contoocook River. This stretch of the river is used by salmon smolts in spring months for downstream passage to the sea. Adult Atlantic salmon returning to the river from the ocean do not make it up this far because they are collected at a dam in Lawrence, Massachusetts primarily for use as broodstock.

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

- The permit prohibits the discharge to cause a violation of State WQS.
- The permit contains water quality-based limits for total residual chlorine, *E. coli*, total phosphorus, ammonia, aluminum, copper, cyanide, silver, and lead.
- The permit prohibits the discharge of pollutants or combinations of pollutants in toxic amounts.
- The permit requires toxicity testing once per year to ensure that the discharge does not present toxicity problems.

EPA believes the draft permit adequately protects EFH and therefore additional mitigation is not warranted. NMFS will be notified and EFH consultation will be reinitiated if adverse impact to EFH are detected as a result of this permit action or if new information becomes available that changes the basis for these conclusions.

X. 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 has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The USFWS administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

As the federal agency charged with authorizing the discharge from this facility, EPA has conducted a review in support of our consultation responsibilities under section 7 (a)(2) of the Endangered Species Act (ESA) for potential impacts to federally listed species. Based on the information available, EPA has determined that the small whorled pogonia (*Isotria medeoloides*) merits further discussion.

The small whirled pogonia, an orchid, has been identified in Hillsborough County, New Hampshire, where the Peterborough WWTF is located. However it has not been identified in the Town of Peterborough itself. In addition, the small whorled pogonia is found in “forests with somewhat poorly drained soils and/or a seasonally high water table,” according to the USFWS website. This species is not aquatic; therefore it is unlikely that it would come into contact with the facility discharge. Furthermore, the primary threats to this species are habitat destruction and herbivory, factors not affected by this permit action.

EPA has made the determination that no protected species are present in the area influenced by the discharge. Therefore, EPA has made the assessment that consultation is not required for these protected species under section 7 of the ESA.

XI. ANTIDEGRADATION

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

The State of New Hampshire performed an antidegradation review in 2011 (see Appendix B) and recommended limits that would result in no lowering of water quality and no loss of existing designated uses in the receiving water. The draft permit is consistent with the antidegradation review.

XII. MONITORING AND REPORTING

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

The draft permit requires the permittee to continue to electronically report monitoring results obtained during each calendar month as Discharge Monitoring Report (DMRs) 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 U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url: https://netdmr.epa.gov.

Further information about NetDMR can be found on the EPA Region 1 NetDMR website located at http://www.epa.gov/region1/npdes/netdmr/index.html.

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 Permit Conditions. With the use of NetDMR to report DMRs and reports, the permittee is no longer be required to submit hard copies of DMRs or other reports to EPA and the NHDES. State reporting requirements are further explained in the draft permit.

XIII. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the state water pollution control agency with jurisdiction over the receiving water(s) in which the discharge originates either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate state WQS or certification is deemed to be waived as set forth in 40 CFR § 124.53. The NHDES is the certifying authority within the State of New Hampshire.

The staff of the NHDES-WD has reviewed the draft permit and advised EPA Region 1 that the limitations are adequate to protect water quality. EPA Region 1 has requested permit certification by the state and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 CFR §§124.53 and §124.55.

XIV. COMMENT PERIOD, REQUESTS FOR PUBLIC HEARINGS 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:

Robin L. Johnson
U.S. Environmental Protection Agency
5 Post Office Square - Suite 100 (OEP06-1)
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1045; Fax: (617) 918-0045

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

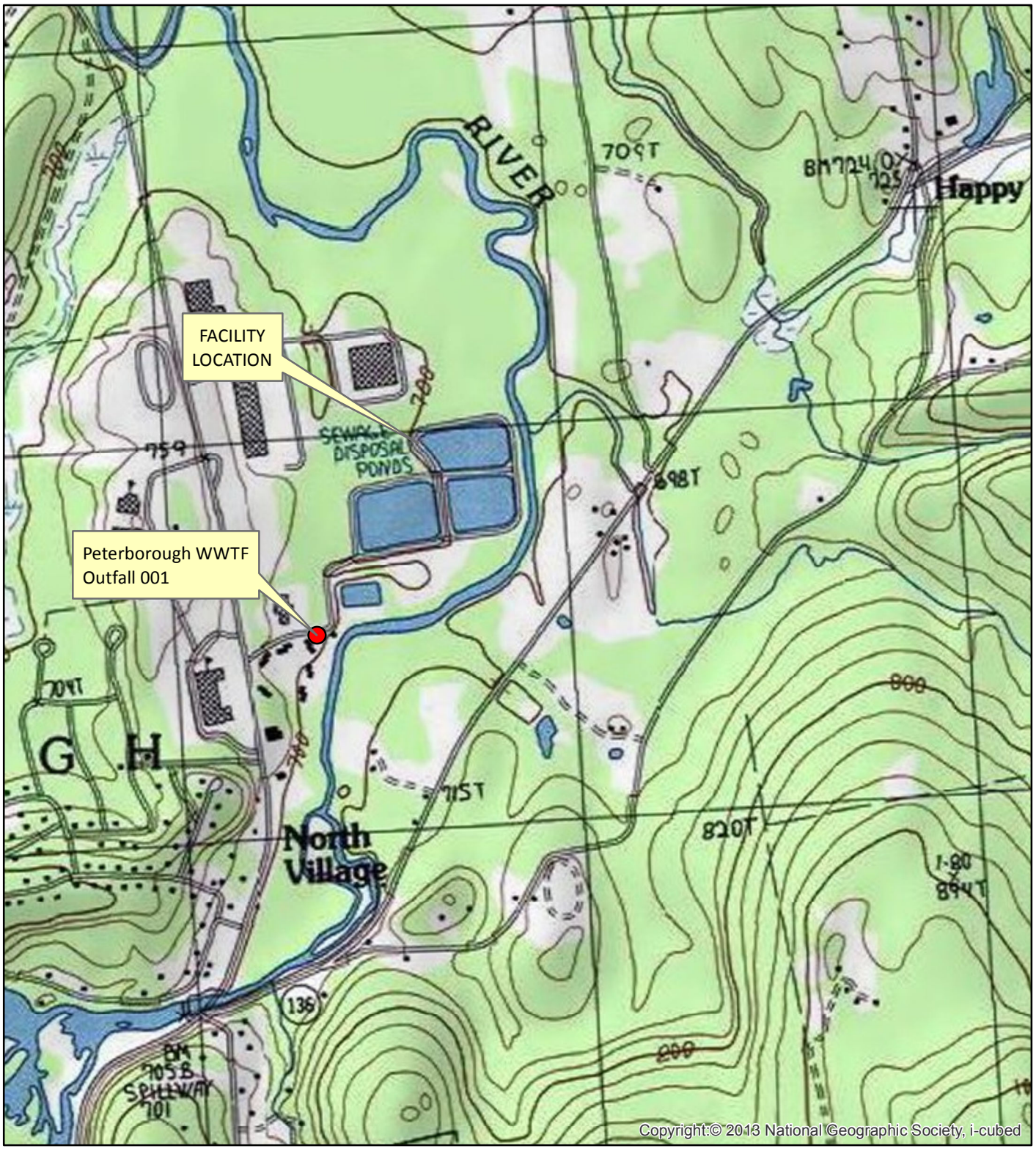
Following the close of the comment period, and after a public hearing (if applicable), the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

Information concerning the draft permit may be obtained between the hours of 9:00 am and 5:00 pm, excluding holidays.

4/29/2015

Date:

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



Scale 1 : 13,955

0 1,000 Feet

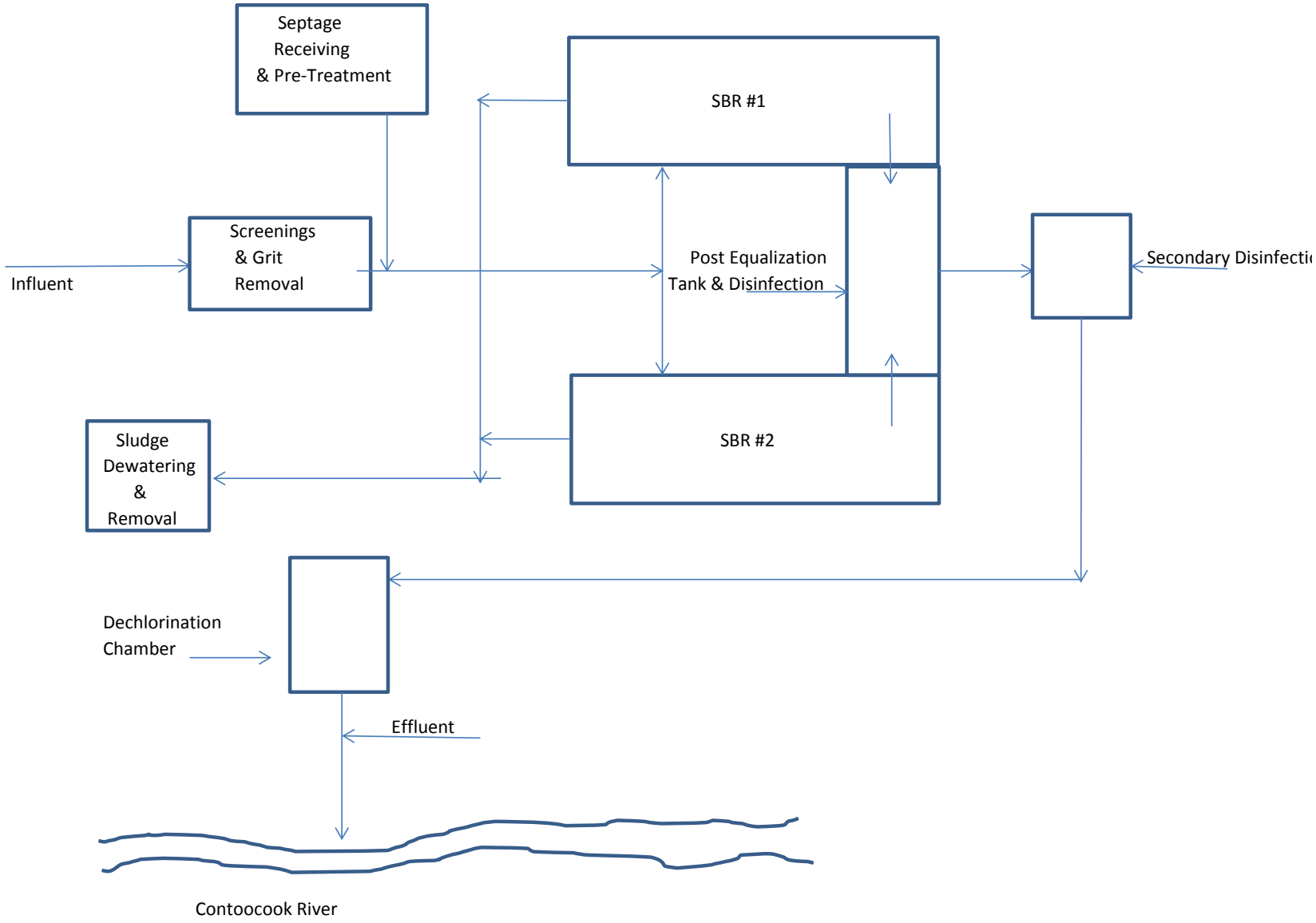
Regulated Facilities: EPA

FIGURE 1
Location Map
Peterborough Wastewater Treatment Facility
Peterborough, NH

EPA

1/15/2015

FIGURE 2
PETERBOROUGH WWTF
PROCESS DIAGRAM



NH0100650 - Peterborough, NH WWTF
Fact Sheet Appendix A

Monitoring Period End Date	Flow, monthly avg	Flow, daily Max	pH Min	pH Max	BOD, avg monthly loading	BOD, weekly avg loading	BOD, max daily loading	BOD, monthly avg	BOD, weekly avg	BOD, max daily	BOD, percent removal	TSS, avg monthly loading	TSS, weekly avg loading	TSS, max daily loading	TSS, avg monthly
	MGD	MGD	s.u.	s.u.	lb/day	lb/day	lb/day	mg/l	mg/l	mg/L	%	lb/day	lb/day	lb/day	mg/l
08/31/2012	0.291	0.341	6.96	7.23	5.4	11.	11.	2.4	5.	5.	99.2	2.2	11.	11.	1.
09/30/2012	0.287	0.565	6.67	7.29	5.1	10.85	10.85	8.52	4.41	4.41	99.	0	0	0	0
10/31/2012	0.311	0.515	6.97	7.41	0	0	38.5	5.8	0	0	100.	0	0	0	0
11/30/2012	0.319	0.455	7.09	7.43	15.9	32.5	13.2	4.1	12.	14.	98.	0	0	0	0
12/31/2012	0.301	0.404	7.16	7.56	10.7	38.5	47.6	8.7	14.	5.	99.	0	0	0	0
01/31/2013	0.319	0.427	7.08	7.49	23.9	47.6	47.6	8.7	17.5	17.5	97.	23.7	103.3	103.3	8.2
02/28/2013	0.337	0.411	7.08	7.36	22.3	25.3	31.1	7.5	8.	11.	98.	4.9	39.2	19.8	1.8
03/31/2013	0.354	0.509	7.04	7.33	11.8	31.1	23.	3.5	11.	6.	99.	0	20	0	0
04/30/2013	0.409	0.501	6.89	7.49	32.3	54.1	54.1	9.	13.	13.	96.6	11.8	28.6	28.6	3.5
05/31/2013	0.321	0.377	7.26	7.52	18.8	29.3	29.3	6.8	11.	11.	97.5	5.8	16	16	2.2
06/30/2013	0.360	0.514	6.9	7.35	20.1	27.2	27.2	6.5	8.	8.	96.9	0	0	0	0
07/31/2013	0.286	0.363	6.93	7.15	17.7	29.6	29.6	6.8	11.	11.	97.	2.8	11.2	11.2	1
08/31/2013	0.269	0.372	6.94	7.4	7.	26.4	26.4	2.8	10.	10.	99.2	2.1	10.5	10.5	0.8
09/30/2013	0.290	0.500	6.95	7.32	5.4	14.1	14.1	2.2	5.	5.	99.1	0	0	0	0
10/31/2013	0.276	0.316	6.95	7.28	15.7	23.1	23.1	7.	10.	10.	97.5	0	0	0	0
11/30/2013	0.275	0.370	6.89	7.12	10.2	15.4	15.4	4.	6.	6.	98.5	0	0	0	0
12/31/2013	0.291	0.343	7.17	7.34	12.4	14.9	14.9	5.	6.	6.	98.1	0	0	0	0
01/31/2014	0.377	0.526	7.07	7.28	38.2	91.1	91.1	12.2	30.	30.	94.	10.7	0	53.3	3.4
02/28/2014	0.323	0.380	6.34	7.23	65.4	171.2	171.2	23.	62.	62.	90.3	44.6	187.7	187.7	16
03/31/2014	0.349	0.749	7.07	7.42	41.8	83.7	83.7	15.5	34.	34.	95.4	10.3	15	15	3.8
04/30/2014	0.481	0.671	6.87	7.24	142.9	284.4	284.4	31.5	65.7	65.7	87.3	16.7	29.5	29.5	4
05/31/2014	0.373	0.472	6.99	7.33	146.	258.4	258.4	53.8	122.	122.	82.4	2.5	12.7	12.7	1.2
06/30/2014	0.317	0.460	6.83	7.23	41.8	74.8	74.8	13.5	19.5	19.5	95.5	3.8	15.1	15.1	1.5
07/31/2014	0.343	0.467	7.01	7.3	19.59	22.78	26.4	5.95	8.01	9.74	97.55	7.8	14.22	14.22	2.6
08/31/2014	0.509	0.778	6.96	7.3	15.7	26.4	31.1	3.3	9.7	6.2	99.	8.	23.9	47.9	1.3
09/30/2014	0.346	0.427	6.7	7.11	30.9	100.6	100.6	10.6	34.8	34.8	96.9	11.6	46.3	46.3	4
10/31/2014	0.393	0.664	6.79	7.09	51.5	158.	158.	15.7	53.3	53.3	95.	2.5	4	12.7	0.8
11/30/2014	0.402	0.440	6.83	7.19	12.6	50.4	50.4	3.7	14.8	14.8	98.6	0	0	0	0
Current Permit Limits	Report	Report	6.0	8.0	125.0	188	209	30	45	50	85	125	188	209	30
Minimum	0.27	0.32	6.34	7.09	0.00	0.00	10.85	2.20	0.00	0.00	82.40	0.00	0.00	0.00	0.00
Maximum	0.51	0.78	7.26	7.56	146.0	284.4	284.4	53.8	122.0	122.0	100.0	44.6	187.7	187.7	16.0
Average	0.34	0.48	6.94	7.31	30.04	62.60	63.82	10.29	21.63	21.25	96.48	6.14	21.01	22.67	2.04
Standard Deviation	0.06	0.12	0.18	0.12	35.71	72.25	71.57	10.73	26.14	26.35	3.90	9.62	39.12	39.66	3.34
#measurement	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
#exceed 2007 limits	N/A	N/A	0	0	2	2	2	2	4	4	1	0	0	0	0

H = invalid test

Appendix B

The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Thomas S. Burack, Commissioner

April 27, 2011

Pamela L. Brenner, Town Administrator
1 Grove Street
Peterborough, NH 03458

Subject: Antidegradation Water Quality Study; Peterborough Wastewater Treatment Facility
NPDES Permit No. NH0100650

Dear Ms. Brenner:

We have completed our review of the four rounds of sampling data submitted in October 2010 by Woodard and Curran on behalf of the Town of Peterborough. The effluent and receiving water sampling results were used to complete an antidegradation review for the proposed increased design flow for the Peterborough WWTF, including an analysis of how the proposed increased discharge will affect water quality and designated uses of the Contoocook River downstream from the WWTF, and calculation of permit limits needed to protect existing water quality. The antidegradation calculations are based on the Peterborough WWTF increasing its design flow from 0.5 mgd to 0.62 mgd.

The antidegradation requirements of the New Hampshire Surface Water Quality Regulations, Part Env-Wq 1708 apply to all pollutants in the proposed increased discharge. However, the upgraded WWTF will provide improved treatment for BOD_5, TSS, ammonia and nutrients and these pollutant loads will not increase compared to the existing WWTF. Therefore, since the discharges of BOD_5, TSS, ammonia and nutrients will be limited to existing levels, the main focus of the antidegradation analysis is on whether increased loads of other pollutants such as metals and toxic organic pollutants discharged by the expanded WWTF will meet state antidegradation requirements.

BOD_5, TSS, Ammonia and Nutrients

Peterborough's existing NPDES permit includes average monthly load limits for BOD_5 and TSS equal to 125 lbs/day. In order to hold these existing average monthly permit loads at the new treatment plant design flow, the upgraded 0.62 mgd WWTF will need to discharge no more than 24.2 mg/l of BOD_5 and TSS on an average monthly basis. Average weekly and maximum daily concentration limits for the expanded plant are based on similar calculations, and these limits are shown in the table below. Likewise, the facility's average monthly summer phosphorus limit will need to be reduced from 0.93 mg/l to 0.75 mg/l to hold the existing permitted phosphorus load at the new increased design flow.

Antidegradation-based BOD_5, TSS and total phosphorus limits applicable to the upgraded WWTF.

Effluent Parameter	Average Monthly	Average Weekly	Maximum Daily
BOD_5, mg/l (lbs/day)	24.2 (125)	36.4 (188)	40.4 (209)
TSS, mg/l (lbs/day)	24.2 (125)	36.4 (188)	40.4 (209)
Total Phosphorus, mg/l	0.75 (Apr – Oct)	-	-

The available effluent ammonia sampling data from the facility's DMRs and the antidegradation study (8 samples in all) indicate that average monthly ammonia discharge load must be held to no greater than 75 pounds per day to ensure that the ammonia load discharged by the expanded WWTF will be no higher

than from the existing WWTF. This is equivalent to an average monthly limit of 14.5 mg/l at the new 0.62 mgd design flow.

Other Pollutants

The sampling data indicate the presence of metals and other pollutants in the WWTF effluent. The Town's effluent and receiving water sampling results were used in spreadsheet calculations to determine the allowable future permit concentrations that would not significantly degrade water quality in the Contoocook River. Also, the data on the quality of the effluent currently discharged from the Peterborough WWTF were used in calculations to evaluate whether there will be reasonable potential for the effluent from the upgraded WWTF to exceed the allowable future pollutant concentrations.

Technical Approach

Peterborough collected Contoocook River samples on four separate dates when the river flow was no greater than 3 times the 7Q10 flow. Samples were collected in June and July 2010. Metals samples were collected using clean sampling techniques, and the samples were analyzed using trace metal analyses to provide low detection limits. The resulting data obtained in this manner defines the existing water quality in the Contoocook River upstream of the Peterborough WWTF discharge. The four rounds of river data were averaged and used in the calculations described below.

Four rounds of effluent samples were also collected for use in the antidegradation calculations.

Antidegradation Calculations

The antidegradation calculations are based on the mass balance equations show below, and the water quality relationships shown in Figure 1 to compute:

- the downstream river assimilative capacity,
- the remaining assimilative capacity,
- the 10% reserve capacity concentration,
- the maximum allowable downstream river concentration to ensure that no more than 20% of the remaining assimilative capacity is used by the WWTF proposed increased discharge, and
- the allowable future WWTF discharge concentration.

Figure 1 shows the relationship between the terms "assimilative capacity", "remaining assimilative capacity", "10% reserve capacity", and "20% of the remaining assimilative capacity".

The maximum allowable downstream river concentration necessary to ensure that no more than 20% of the remaining assimilative capacity is used by the proposed WWTF discharge is calculated as follows:

$$[(0.9 \times \text{Assimilative Capacity Conc.} - \text{Existing Water Quality Conc.}) \times 0.2] + \text{Existing Water Quality Conc.}$$

Next, the allowable future permit concentration is calculated as follows:

$$\frac{\text{Allowable Downstream Loading} - \text{Upstream Ambient Loading}}{\text{Proposed WWTF Flow} \times 8.34}$$

Evaluating Reasonable Potential

Effluent data from the existing WWTF were used to evaluate whether there would be reasonable potential for the effluent to exceed the future maximum allowable permit concentration. The calculations follow the statistical approach outlined in Section 3 of *Technical Support Document for Water Quality-Based Toxics Control*, March 1991, EPA/502/2-90-001 (TSD). The table below shows the results of the Peterborough WWTF reasonable potential evaluation:

Peterborough WWTF
Antidegradation Study Results for Proposed Increased Discharge to the Contoocook River

Parameter	Number of Effluent Samples "n"	Maximum Measured Effluent Conc. (mg/l)	TSD Table 3.1 Reasonable Potential Multiplication Factor	Max Value x Multiplication Factor	Maximum Allowable Permit Concentration to use less than 20% of Remaining Assimilative Capacity (mg/l)	Reasonable Potential (yes/No)
Aluminum (chronic)	4	0.070	4.7	0.329	0.109	yes
Antimony (chronic)	4	0.00050	4.7	0.00235	3.53	no
Arsenic (fish cons.)	4	0.0013	4.7	0.00611	*	*
Arsenic (chronic)	4	0.0013	4.7	0.00611	0.31	no
Beryllium (chronic)	4	0.0005	4.7	0.00235	0.009	no
Cadmium (chronic)	4	0.0001	4.7	0.00047	0.0016	no
Chromium (chronic)	4	0.0016	4.7	0.00752	0.061	no
Copper (chronic)	4	0.0062	4.7	0.0291	0.0073	yes
Lead (chronic)	4	0.0013	4.7	0.00611	0.0012	yes
Mercury (fish cons.)	4	0.0000079	4.7	0.00004	0.000072	no
Mercury (chronic)	4	0.0000079	4.7	0.00004	0.0020	no
Nickel (chronic)	4	0.0031	4.7	0.01457	0.036	no
Selenium (chronic)	4	0.0005	4.7	0.0024	0.008	no
Silver (acute)	4	0.0004	4.7	0.00188	0.00063	yes
Thallium (fish cons.)	4	0.0005	4.7	0.00235	0.011	no
Zinc (chronic)	4	0.0075	4.7	0.0353	0.067	no
Total Cyanide (chronic)	4	0.016	4.7	0.07520	0.0052	yes**

* The four Contoocook River samples indicate arsenic levels that exceed the applicable water quality criteria. The water quality criteria are too low for standard laboratory detection. DES would support a "monitoring only" requirement in Peterborough's permit.
** The river and effluent samples indicate cyanide levels that exceed the chronic criteria. The limit shown above is equal to the chronic criteria of 0.0052 mg/l.

Conclusions

The permit limit calculations and the reasonable potential analysis show that Peterborough's proposed increased discharge has potential to result in a significant lowering of water quality in the Contoocook River with respect to aluminum, copper, lead, silver, and cyanide. Permit limits equal to the "Maximum Allowable Permit Concentrations" shown in the table above will be necessary to ensure that the proposed increased discharge will not result in a significant lowering of water quality.

The cyanide sampling results indicate that the effluent and receiving water exceed the chronic aquatic life criterion of 0.0052 mg/l, and therefore the above table includes an effluent limit equal to 0.0052 mg/l. Repeating the river and effluent sampling using clean sampling techniques and lower detection limits may

provide a more accurate measure of remaining assimilative capacity, and possibly lead to a less stringent effluent limit.

Peterborough's WWTF upgrade is underway, and the Town's next NPDES permit application to EPA can be based on the proposed increased design flow of 0.62 mgd. DES will provide the antidegradation calculations to EPA for their use in preparing Peterborough's next permit. Please be aware that EPA may choose to include more stringent permit limits for nutrients or other parameters based on a TMDL or other available information.

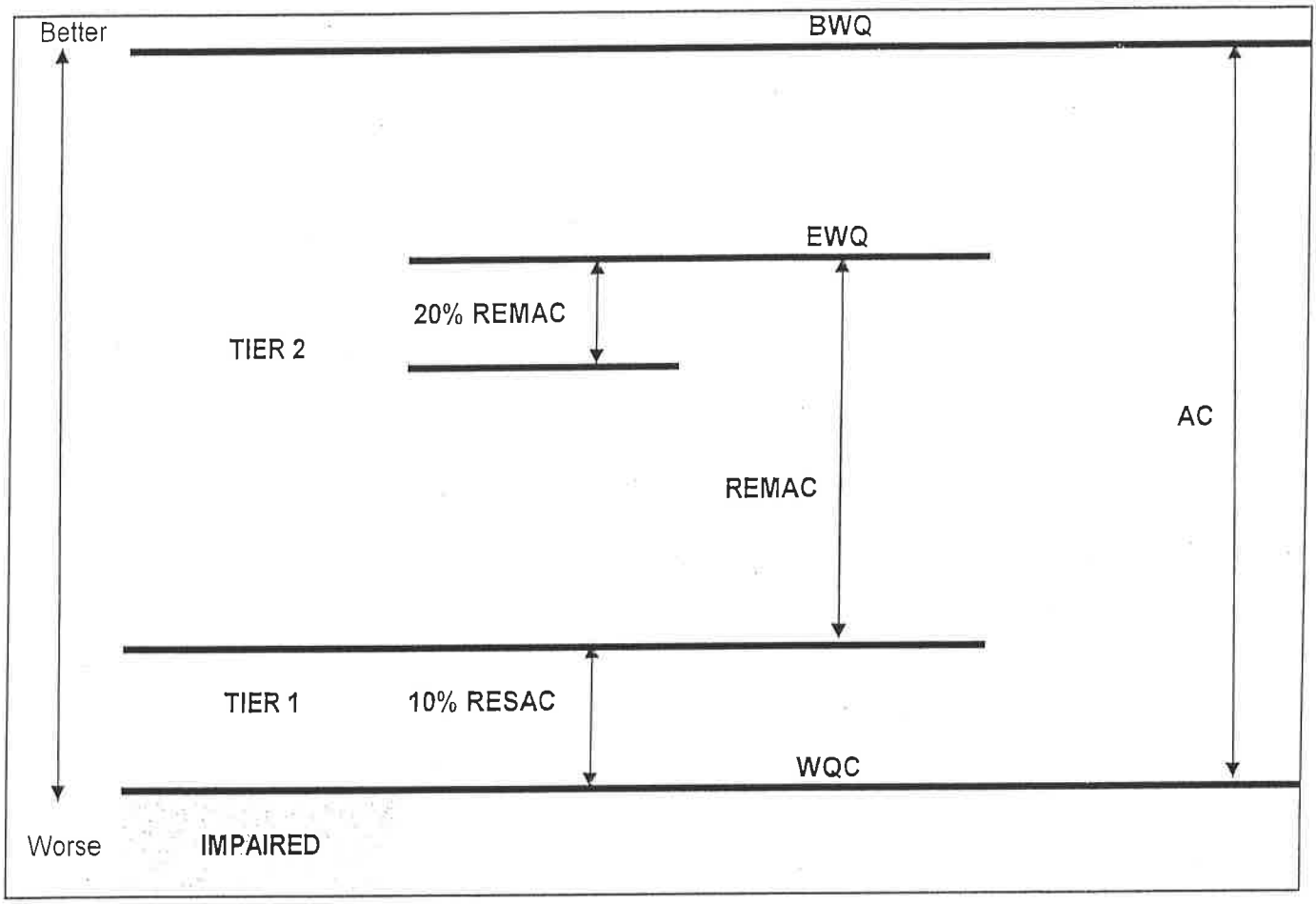
Please feel free to contact me at (603) 271-2001 or Stergios Spanos at (603) 271-6637 with any questions, or if you wish to meet to discuss any issue related to the antidegradation study.

Sincerely,

Paul Heirtzler, P.E., Administrator
Water Division, Wastewater Engineering Bureau

cc: Rodney Bartlett, Peterborough DPW
Bob Severence, Woodard & Curran
David Dinsmore, Woodard & Curran
Brian Pitt, USEPA-New England
Thomas Burack, Commissioner, NHDES
Harry Stewart, P.E., Director, NHDES-WD
Paul Currier, WD/WMB
Stergios Spanos, P.E., WD/WWEB

FIGURE 1. WATER QUALITY RELATIONSHIPS USED IN ANTIDEGRADATION CALCULATIONS



Where:
BWQ = Best Possible Water Quality (mass/L) – assumed to be zero
EWQ = Existing Water Quality downstream of WWTF at existing permitted load (mass/L)
WQC = Water Quality Criteria (mass/L)
AC = Assimilative Capacity (mass/L) = WQC – BWQ
10% RESAC = 10% Reserve Assimilative Capacity = AC * 0.9 (mass/L)
REMAC = Remaining Assimilative Capacity (mass/L) = (AC * 0.9) – EWQ
20% REMAC = 20% Remaining Assimilative Capacity (mass/L)

Maximum Allowable Downstream Concentration to be considered "Insignificant" = EWQ + (20% REMAC)

APPENDIX C –BACKGROUND FOR STATISTICAL ANALYSIS OF METALS EFFLUENT DATA

In order to account for the uncertainty that arises from small sample sizes (n<10), EPA uses a methodology from the *Technical Support Document for Water Quality-based Toxics Control* ("the TSD") to calculate a projected upper bound of effluent concentrations based on a statistical analysis of the facility's effluent data. As the statistical parameters of the sample distribution may differ from the underlying population, this approach determines a projection of the possible upper bound effluent concentration at the 95th percentile with a 95 percent confidence level, assuming a lognormal distribution of the underlying sample population. This 95th percentile projected upper bound represents a conservative estimate of the possible upper bound concentration based on a limited dataset. Where this upper bound concentration would not result in an exceedance of water quality criteria in the receiving water, EPA can say with certainty (95 percent confidence) that the data excludes the potential for an exceedance. Where that is not the case, EPA requires additional monitoring to better characterize the effluent.

The statistical analysis characterizes the maximum measured concentration as a percentile of the underlying distribution at a particular confidence level, then scaling that number upward by a "multiplying factor" in order to project an upper bound concentration at that confidence level. For sample datasets with less than 10 data points, EPA uses the 95th percentile with a 95 percent confidence level to characterize the upper bound concentration, see table 3-2 of the TSD.

The formula for characterizing a maximum measured concentration as a percentile is:

$$p_n = (1 - \text{confidence level})^{1/n}$$

This formula gives the lowest percentile that a maximum measurement may correspond to, given a specific confidence level (EPA uses the 95 percent confidence level). For example, where n=4, we can be 95 percent confident that the maximum measurement represents at least the 47th percentile of the underlying distribution, since:

$$p_n = (1 - 0.95)^{1/4} = 0.473.$$

It should be noted that this represents the lower end of the 95 percent confidence interval. Because of the uncertainty due to the small sample size there is a significant range in interpretation of the maximum; where n=4 we can be 95 percent confident that the maximum value represents somewhere between the 47th and 99th percentile of the underlying distribution. See Section 3.3.2 of the TSD for more information.

The calculated percentile is then scaled up to a projected upper bound based on a selected probability basis (here the 95th percentile). The scaling factor (or "multiplying factor") is the ratio between the 95th percentile and the calculated percentile in a lognormal distribution with a particular coefficient of variation. These are calculated as follows:

Multiplying factor = C_{95}/ C_{pn}; where

$$C_{95} = \exp(1.645\sigma - 0.5\sigma^2);$$

$C_{pn} = \exp(z_{pn} \times \sigma - 0.5\sigma^2)$;
z_{pn} = z-score of the calculated percentile
σ^2 = variance of the log-transformed data = $\ln (CV^2 + 1)$
CV = coefficient of variation

The *TSD* recommends use of a coefficient of variation of 0.6 where sample size is less than 10. Thus for n=4 the multiplying factor (for 95-percent confidence level and 95th percentile probability basis) is:

$p_n = 0.473$
$z_{pn} = -0.068$
$C_{95} = 2.135$
$C_{47} = 0.826$

Multiplying factor = 2.6

In practice this process is implemented using tables set forth in *TSD*, chapter 3 and box 3-2, as follows:

Step 1) The maximum effluent value of the samples is determined.
Step 2) Coefficient of variation (CV) = 0.6, for less than 10 samples
Step 3) The multiplying factor (MF) is determined using table 3-2 in the TSD, based on the number of samples in the data set and a CV of 0.6.
Step 4) The 95th percentile projected upper bound is the maximum effluent value multiplied by the MF.

Appendix D

Town of Peterborough
1 Grove Street
Peterborough, NH 03458
Fax number (603)371-9033

June 10, 2014

NPDES Permit #NH0100650

Ms. Joy Hilton
Water Technical Unit
U.S. Environmental Protection Agency
OES4-3
5 Post Office Square, Suite 100
Boston, Ma 02109-3912

RE: Peterborough WWTP Maximum Daily BOD violation 5-Day Letter

Dear Ms. Hilton,

This is a follow up letter regarding Daily Maximum BOD violations that were reported to you and Thomas Croteau of NHDES on June 10th by Lewis Gregory Jr., for a violation that were reported by our contract laboratory Chemserve that occurred on May 29th of the following:

- daily maximum BOD of 57.1 mg/L

As you can see in our comparison of our test results below of Effluent BOD5 to Effluent CBOD our contract lab did on the past 2 sampling events, we conclude that our BOD violations are caused by nitrification in the BOD5 test rather than by improper operation or design. It is reasonably to say that previous BOD violations that occurred this year were also caused by nitrification in the BOD5 tests.

In the 21st and 22nd ed. of Standard Methods it defines BOD as "the test measures the molecular oxygen utilized for the biochemical degradation of organic material and inorganic material such as sulfides and ferrous iron." It also states; "Because oxidation of nitrogenous compounds can occur in such samples, inhibition of nitrification as directed in 5210B.5e is recommended for samples of secondary effluent, for samples seeded with secondary effluent and for samples of polluted waters." And "Chemical inhibition of nitrogenous demand provides a more direct and more reliable measure of carbonaceous demand."

Our plan as discussion today, I will be contacting our permit writers Robin Johnson of EPA and Amy Clark of NHDES to request a change in our permit from BOD5 to CBOD. We will continue to test for CBOD along with BOD for backup data to support this change.

Comparison of BOD5 & CBOD laboratory results:

5/23/14 BOD5 =7.40 mg/L CBOD = < 3mg/L (in CBOD lab note stated no oxygen loss)
5/29/14 BOD5 = 57.1 mg/L CBOD = < 3 mg/L (in CBOD lab note stated no oxygen loss)

If you have any questions or concerns please feel free to contact me at (603) 924-8000.

Sincerely,

Lewis Gregory Jr., Lead Operator

cc: Mr. Thomas Croteau, NHDES

August 23, 2016

Response to Public Comments

In accordance with the provisions of 40 C.F.R. §124.17, this document presents EPA's responses to comments received on the draft NPDES Permit, #NH0100650. The response to comments explains and supports the EPA determinations that form the basis of the final permit. From May 6, 2016 through June 25, 2016, the United States Environmental Protection Agency ("EPA") and the New Hampshire Department of Environmental Services ("NHDES") (together, the "Agencies") solicited public comments on a draft NPDES permit, #NH0100650, developed pursuant to a permit application from Town of Peterborough for the reissuance of a National Pollutant Discharge Elimination System ("NPDES") permit to discharge treated domestic wastewater from outfall number 001 to the Contoocook River in Peterborough, New Hampshire.

After a review of the comments received, EPA and NHDES have made a final decision to issue this permit authorizing these discharges. The final permit is substantially identical to the draft permit that was available for public comment.

Although EPA's decision-making process has benefitted from the comments and additional information submitted, the information and arguments presented did not raise any substantial new questions concerning the permit. EPA did, however, make one minor change in response to the comments:

1) On page 3 of 18, the monthly average cyanide concentration limit was changed to a quarterly monitoring requirement. See Response 8.

Copies of the final permit may be obtained from Robin Johnson at (617) 918-1045 or by writing EPA's NPDES Municipal Permits Branch (OEP 06-1), Office of Ecosystem Protection, 5 Post Office Square, Suite 100, Boston, MA 02109-3912.

Comments submitted by Nate Brown, Assistant Utilities Superintendent, Town of Peterborough

Comment 1:

Included with this letter are spreadsheets for domestic wastewater background concentrations for metals, treatment plant influent and effluent, river samples for metals and cyanide, and drinking water results for your review. Peterborough believes that the information provided justifies "report only" criteria for aluminum, copper, silver, arsenic, zinc, and cyanide; and, a lbs./day limit for lead.

Response 1:

Thank you for the additional information. Responses addressing each of the individual parameters referenced above are provided below in Responses 2 through 8. With respect

to the request to have "report only" for these parameters, federal regulations found at 40 CFR §122.44(d)(1) require the inclusion of permit requirements necessary to achieve water quality standards established under Section 303 of the Clean Water Act, including State narrative criteria for water quality and antidegradation requirements. Further, 40 CFR §122.44(d)(2) requires that effluent limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water. Accordingly, the effluent limitations for aluminum, copper, lead, silver, and zinc are based on numeric water quality criteria found in the State of New Hampshire's Surface Water Quality Regulations and on the application of state antidegradation requirements. Antidegradation requirements are triggered in this case because of the increase in design flow associated with the treatment plant upgrade. Thus, the effluent limitations in the draft permit for aluminum, copper, lead, silver, and zinc remain in the final permit. The final permit, as with the draft, requires once per month monitoring for total recoverable arsenic. This is discussed below in Response 6.

Comment 2:

Aluminum found in the domestic wastewater is an uncontrollable source and represents a significant contribution found in the Wastewater Influent.

Response 2:

EPA recognizes that there are sources of aluminum in domestic wastewater that cannot be addressed through source control, including in the treatment system itself when alum compounds are used for phosphorus removal. Nonetheless, as described in Response 1, federal regulations require inclusion of permit limitations necessary to achieve water quality standards regardless of the source of aluminum within domestic wastewater.

Comment 3:

Peterborough's most recent final effluent lead testing, from 5/16/2016, 5/19/2016, 6/02/2016 and 6/09/2016 shows compliance with water quality criteria for lead in the Contoocook River with results of <0.0005 and 0.0005 mg/l. We shall continue to periodically sample the river to show compliance in the future. We are asking the EPA to consider a lbs./day limit in lieu of a concentration based limit (0.00054 mg/l).

Response 3:

The results referenced in this comment correspond with the upstream lead data rather than effluent lead data. EPA will assume that the commenter intended to reference upstream lead in the comment.

EPA typically analyzes effluent and upstream pollutant data from the previous five years in setting effluent limits. Data from July 2012 through June 2016, shown in Table 1 below, indicate that the effluent does not meet the chronic aquatic life criterion for lead which is 0.54 µg/L. Deriving a single "average" value from the data for the Contoocook River upstream of the facility to compare to the water quality standard is challenging due to several non-detects and the detection level being close to the 0.54 µg/L chronic water quality criterion for lead.

Table 1. Summary of Effluent and Upstream Lead Data

Date	Upstream Total Recoverable Lead, µg/L	Effluent Total Recoverable Lead, µg/L
7/23/2012	0.7	11
7/1/2013	0.6	4
7/14/2014	0.7	4
7/20/2015	0.6	3
5/11/2016	NS	3
5/16/2016	ND (<1)	NS
5/19/2016	ND (<0.5)	4
6/2/2016	0.5	3.15
6/9/2016	ND (<0.5)	NS
6/15/2016	ND (<0.5)	2

ND = Not detected (detection level in parentheses)
NS = Not sampled

With non-detects at two different detection levels, specifying the mean or median as the statistical central tendency of this data set is not a straight-forward exercise. EPA considered procedures developed by Bolks, et al[1] to evaluate the data with the statistical software R. The upstream lead data were analyzed using three statistical models. A summary of the analysis is provided below in Table 2.

[1] A. Bolks, A. DeWire, and J.B. Harcum. 2014. Baseline assessment of left-censored environmental data using R. Tech Notes 10, June 2014. Developed for U.S. Environmental Protection Agency by Tetra Tech, Inc., Fairfax, VA, 28 p. Available online at
http://www.bae.ncsu.edu/programs/extension/wqg/319monitoring/tech_notes.htm
This publication includes an example script for computing summary statistics for left-censored data using robust regression on order statistics (ROS), maximum likelihood estimation (MLE), and Kaplan-Meier (KM) method. See Helsel (2012) and Lopaka (2013) for documentation.
Helsel, DR. 2012. Statistics for Censored Environmental Data. Wiley and Sons.
Lopaka Lee 2013. NADA: Nondetects And Data Analysis for environmental data. R package version 1.5-5.
http://CRAN.R-project.org/package=NADA

Table 2. Results of Statistical Analysis of Upstream Lead Data
(n = 9, number of censored results = 4, percent of censored results = 44.4%)

	Median (µg/L)	Mean (µg/L)	Standard Deviation
Robust Regression on Statistics	0.550	0.548	0.119
Maximum Likelihood Estimation	0.540	0.552	0.115
Kaplan-Meier	0.500	0.575	0.098

According to Bolks, the first two methods, ROS (Regression on Statistics) and MLE (Maximum Likelihood Estimation), are best suited for data sets with only one detection level. Bolks et al also describes the Kaplan-Meier model, a type of nonparametric survival analysis often used in the health sciences, for data sets with less than 50 percent censoring and multiple censoring levels. As shown above, all three analyses predict similar means and medians, ranging from 0.500 µg/L to 0.575 µg/L.

In this case, however, the lack of assimilative capacity in the river is independent of which mean or media value from Table 2 is considered. Using even the lowest central tendency value of 0.50 µg/L, there is no remaining assimilative capacity for lead in the Contoocook River once NHWQS are applied. NHWQS require that 10% of the assimilative capacity of a waterbody be reserved for future uses, meaning that the water quality criterion to be applied in this case would be 0.486 µg/L (0.54 µg/L x 0.9). Because both the upstream and the effluent lead concentrations exceed 0.486 µg/L, there is not sufficient assimilative capacity to consider dilution in this effluent determination. Therefore, the effluent limit will be an average monthly concentration of 0.54 µg/L, as in the draft permit. The final permit includes a four-year compliance schedule, during which time the interim monthly average lead limit will be 5 µg/L.

EPA understands that the existing treatment plant will be unable to achieve the new water quality-based limit for total recoverable lead in the reissued permit. However, Federal regulations found at 40 CFR §122.44(d)(1) require the inclusion of permit requirements necessary to achieve water quality standards established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

Regulations found at 40 CFR § 122.45(f)(ii) state that all pollutants limits in permits shall have limitations, standards, or prohibitions expressed in terms of mass except when applicable standards are expressed in other terms of measurement. Since the State of New Hampshire water quality standards are expressed in terms of concentration (µg/L) the final effluent limitation for lead remains as a concentration based limit of 0.54 µg/L in the final permit.

Comment 4:

Copper found in Peterborough's most recent Final Effluent testing shows compliance with the draft copper limit at plant design criteria of 0.62 MGD.

Response 4:

It is encouraging that the recent tests show compliance with the draft copper limit. The effluent limitation is necessary and remains in place in order to comply with State of New Hampshire antidegradation requirements found at Env-Wq 1708.09. The application of these antidegradation requirements to derive the effluent limitations is described in the Fact Sheet and is triggered by the increase in the design flow associated with the treatment plant upgrade.

Comment 5:

Silver found in Peterborough's most recent Final Effluent testing, and most recent river testing, shows that we are able to get down to <0.0005 mg/l in both cases.

Response 5:

Thank you for this information. However, the effluent limitation remains in place in order to comply with State of New Hampshire antidegradation requirements found at Env-Wq 1708.09. It is encouraging that the recent testing shows the facility's ability to get down to <0.0005 mg/l of silver in both effluent and river samples.

Comment 6:

Arsenic in Peterborough's Final Effluent from Peterborough's most recent testing were able to show a result of <0.0005 mg/l.

Response 6:

Thank you for this information. However, the monitoring requirement remains in place in order to comply with State of New Hampshire antidegradation requirements found at Env-Wq 1708.09. It is encouraging that the recent testing shows the arsenic levels are <0.0005 mg/l.

Comment 7:

Zinc found in Peterborough's domestic wastewater is an uncontrollable source and EPA documents to develop local limits shows that the background concentrations found from domestic sources to be 0.175 mg/l. As a result, the majority of zinc found is coming from an uncontrollable source. We have enclosed EPA Literature showing the typical domestic wastewater concentration for zinc to be 0.175 mg/l. In addition we have included our wet testing for metals results for our final effluent and river taken from 2009-2015. Please note: result for zinc since 2012 better reflects current conditions in our final effluent. Results for zinc prior to this date is when the facility was still operated as a lagoon.

Response 7:

As with aluminum, EPA recognizes that zinc is present in domestic wastewater; thus the treatment plant may not be able to reduce concentrations through source control. Supplemental data submitted during the public comment period is similar to the data EPA used to set effluent limits in the draft permit. Therefore, the total recoverable zinc limit remains 0.35 lbs/day as a monthly average. Based on recent effluent data, it appears that the facility will be able to meet the limit at current rates of effluent flow.

State of New Hampshire regulations found at Env-Wq 1704 provide for the development of site specific criteria. If the Town of Peterborough wishes to pursue this option it should coordinate closely with EPA and NHDES.

Comment 8:

Cyanide found in Peterborough's most recent Final Effluent testing and most recent river testing shows that Peterborough was able to get down as low as <0.005 mg/l in both cases. We are asking EPA to consider a lbs. /day limit in lieu of a concentration limit (0.0052 mg/l).

Response 8:

Based on the supplemental data submitted by the permittee, cyanide concentrations in the upstream and effluent appear to be less than 5 µg/L, compared to a chronic water quality criterion of 5.2 µg/L for the protection of aquatic life. Please see Table 2 below.

Table 2. Summary of Upstream and Effluent Cyanide Data

Date	Upstream Cyanide, µg/L	Effluent Cyanide, µg/L
5/16/2016	ND (<20)	NS
5/19/2016	ND (<5)	ND (<5)
6/15/2016	ND (<5)	ND (<5)

ND = Not detected (detection level in parentheses)
NS = Not sampled

The data used to determine antidegradation requirements in the draft permit were collected in 2010, before the facility upgrades. Data collected after the WWTF upgrade, with lower detection limits, indicate that both upstream and effluent cyanide are below water quality criteria. For this reason, it is no longer clear that an antidegradation limit is necessary for cyanide.

Therefore, instead of an effluent limit, the final permit contains a quarterly monitoring requirement for cyanide. These data will be used at the next permit reissuance to determine whether a cyanide effluent limit is needed.

Comment 9:

Many of the limits in the new NPDES draft permit were derived and calculated, in many cases, using only 4 analytical results from the antidegradation water quality study collected 5 years ago, and from annual WET testing on our Final Effluent and the Contoocook River for metals and cyanide. As a result, it is our opinion that the analytical data recently collected for the town by the wastewater personnel would better reflect current conditions in our Final Effluent and the river.

Response 9:

EPA agrees that more recent effluent data better reflect current conditions. EPA generally prefers to use data collected during the preceding five years to make permitting decisions. EPA has used 2016 data, where available, along with WET test data for upstream conditions from 2012 through 2015, to determine effluent limits in the final permit.

Comment 10:

Peterborough is requesting the EPA to consider our ongoing analytical testing program currently utilized in protection of the Contoocook River's water quality. We believe that a "report only" permit would preserve the best-practices currently and successfully in place, while helping to reduce costly regulatory requirements for the Town of Peterborough. The Town of Peterborough is requesting a "report only" permit, whereby screening level outliers would require resampling for pollutants of concern, and, language would be added to the permit requiring an ongoing analytical testing program to reduce concentrations necessary in the Final Effluent required to meet water quality criteria.

Response 10:

See Response 1 concerning the request for "report only" requirements.

As discussed above, EPA has considered effluent and upstream data from 2012 through 2016 in setting limits in the final permit. As discussed above the effluent limitations in the final permit have been established to comply with federal regulations at 40 CFR §122.44(d)122 and State of New Hampshire antidegradation requirements found at Env-Wq 1708.09

Comment 11:

Draft Permit Correction: The sludge from the wastewater treatment facility is now currently being hauled off site to locations in Rhode Island and Massachusetts. As a result, section E (sludge conditions) in the draft permit document does not apply to Peterborough at this time.

Response 11:

Publicly Owned Treatment Works (POTWs) are subject to sludge regulations regardless of whether they treat the sludge onsite or send it elsewhere, because they generate sewage sludge during the wastewater treatment process. As Part I.E.7. of the draft and final permit explains,

> *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.*

Part I.E.8. specifies the responsibilities of POTW operators as follows:

> *If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:*
>
> *a. Name and address of contractor(s) responsible for sludge preparation, use or disposal*
> *b. Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge*

Because Peterborough WWTF contracts with offsite sludge handlers, it only needs to send an annual sludge report including items a. and b. above. The final permit is unchanged.

Comment 12:

Draft Permit Correction: NH Ball Bearing's process flow has increased since the last Industrial Wastewater Permit was issued in 2007 and expired in 2012. The town is currently working with directly with NHBB on an updated permit, and will be obtaining NHDES approval reflecting these changes. With this considered, Peterborough currently lacks the necessary information it would need to better inform the NPDES permit regarding this specific item.

Response 12:

Peterborough WWTF is not currently required to have a pretreatment program, which means that it is not required to evaluate local limits as part of the permit reissuance.

However, the Peterborough WWTF is still subject to pretreatment regulations at 40 CFR § 403, which prohibit pass through and interference. Pass through is defined as any discharge that passes through a POTW without proper treatment and causes violation of the NPDES permit. Interference is any discharge that directly interferes with or upsets the POTW treatment process. Local limits for industrial users must prevent both pass through and interference to comply with pretreatment regulations.

Comment 13:

In response to the Powder Mill Pond ambient monitoring requirement of the Contoocook River downstream from the Peterborough WWTF, it is our opinion that other towns and facilities upstream and downstream of the Peterborough WWTF should also be considered to take part in such a study. Singling out Peterborough as the only community impacting Powder Mill Pond would be unfair to the Town of Peterborough sewer rate payers. Peterborough is a small community with roughly 1300 users currently tied to the wastewater treatment facility. Perhaps Peterborough and others that impact the Powder Mill Pond could share in the expense of the monitoring requirement. Contoocook North Branch Rivers Local Advisory Committee (CNBRLAC) might be interested in working with the town and others to accomplish the required sampling and testing of the Powder Mill Pond.

Response 13:

EPA agrees that ambient sampling is usually done by the state or by watershed groups. In this case no such data have been collected over the past ten years. If another party commits to ambient sampling of Powder Mill Pond, EPA may modify Peterborough WWTF's NPDES permit to remove this requirement.

Comment 14:
Since the Peterborough Wastewater Facility has not violated our bio-toxicity testing requirements in the past, we are asking the EPA to consider reducing the requirements to "test only" for acute bio-TOX testing, and eliminate the chronic testing requirement.

Response 14:

The acute and chronic WET test limits have not changed, because these limits are a function of the dilution of the effluent in the receiving water. EPA Region 1's policy requires that secondary treatment facilities with a dilution factor between 10 and 20 meet an acute (LC50) toxicity limit of 100 percent effluent and report the chronic-no observed effect concentration (C-NOEC). These limits remain in place, as required by antibacksliding provisions found in 40 CFR § 122.44(l).

EPA may reduce monitoring requirements if a permittee has a history of consistent permit compliance. However, Peterborough's current WET test frequency is once per year, which is EPA Region 1's minimum WET test frequency for POTWs. Therefore, the once per year WET test frequency remains in place.

Comment 15:

Peterborough is requesting EPA to consider reducing the frequency of metal and cyanide testing to once a month rather than twice a month to reduce our analytical cost.

Response 15:

The monitoring frequency for cyanide was changed from twice per month to once per quarter in light of recent data. Please see Response 8.

Monitoring frequencies for metals in the final permit are consistent with EPA and NHDES Effluent Monitoring Guidance dated July 19, 1999. These sampling frequencies were developed to adequately characterize the effluent and monitor compliance. Therefore the metal monitoring frequencies remain unchanged in the final permit.