

**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 Troy, New Hampshire

is authorized to discharge from the Wastewater Treatment Plant located at

**151 Dort Street
Troy, New Hampshire 03465**

to receiving waters named

**South Branch of the Ashuelot River
(Hydrologic Basin Code: 01080201)**

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 Troy Wastewater Treatment Plant collection system.

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

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

This permit supersedes the permit which became effective on January 19, 2003 and modified on January 28, 2005.

This permit consists of **Part I** (15 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) and **Part II** (25 pages including NPDES Part II Standard Conditions).

Signed this 25th day of September, 2013.

/S/SIGNATURE ON FILE

Ken Moraff, Acting 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 sanitary wastewater from outfall serial number 001 to the South Branch of the Ashuelot 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.

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>			<u>Monitoring Requirements</u>	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow; mgd	Report		Report	Continuous Recorder ¹	
CBOD ₅ ; mg/l (lb/day)	25 (55.3)	40 (88.5)	45 (99.5)	1/Week ²	Grab
TSS; mg/l (lb/day)	30 (66.3)	45 (99.5)	50 (110.6)	1/Week ²	Grab
Total Phosphorus; mg/l (lb/d) [Applicable April 1 – October 31]	Report (0.34)		Report (Report)	1/Week	Grab
pH Range ³ ; Standard Units	6.5 to 8.0 (See I.H.5.)			1/Day	Grab
Total Nitrogen ⁴ ; mg/l (lb/d)	Report (Report)	---	Report (Report)	1/Quarter	Grab
Total Kjeldahl Nitrogen ⁴ ; mg/l (lb/d)	Report (Report)	---	Report (Report)	1/Quarter	Grab
Nitrate + Nitrite ⁴ ; mg/l (lb/d)	Report (Report)	---	Report (Report)	1/Quarter	Grab
Ammonia Nitrogen as N; mg/l (lb/d) [Applicable October 1 – April 30]	13.2 (29.2)	---	Report (Report)	1/Week	Grab
Ammonia Nitrogen as N; mg/l (lb/d) [Applicable May 1 – September 30]	8.7 (19.2)	---	Report (Report)	1/Week	Grab
<i>Escherichia coli</i> ^{5,6} ; Colonies/100 ml	126	---	406	2/Week	Grab
Total Residual Chlorine ^{5,7} ; mg/l	0.02	---	0.04	1/Day	Grab
Total Recoverable Aluminum ⁸ ; ug/l	Report	---	Report	1/Quarter	Grab
Total Recoverable Copper ⁸ ; ug/l	3.1	---	4.2	2/Month	Grab

See pages 4 and 5 for footnotes

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>			<u>Monitoring Requirements</u>	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Whole Effluent Toxicity LC50 ^{9,10,12,13} ; Percent	100			1/Year	Grab
Whole Effluent Toxicity C-NOEC ^{9,11,12,13} ; Percent	≥50			1/Year	Grab
Hardness ¹³ ; mg/l	---	---	Report	1/Year	Grab
Total Recoverable Aluminum ^{8,13} ; ug/l	---	---	Report	1/Year	Grab
Total Recoverable Cadmium ¹³ ; mg/l	---	---	Report	1/Year	Grab
Total Recoverable Copper ^{8,13} ; ug/l	---	---	Report	1/Year	Grab
Total Recoverable Lead ¹³ ; ug/l	---	---	Report	1/Year	Grab
Total Recoverable Nickel ¹³ ; mg/l	---	---	Report	1/Year	Grab
Total Recoverable Zinc ¹³ ; mg/l	---	---	Report	1/Year	Grab

See pages 4 and 5 for footnotes

FOOTNOTES

1. The effluent flow shall be continuously measured and recorded using a flow meter and totalizer.
2. Effluent sampling frequency. The influent shall be sampled twice per month (2/month) using a 24-hour composite sample and the results reported as average monthly values.
3. State certification requirement.
4. The quarterly testing for Total Nitrogen, Total Kjeldahl Nitrogen, and Nitrate + Nitrite Nitrogen shall be performed in January, April, July, and October.
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 (7) 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.

The limit, at which compliance/noncompliance determinations for Total Residual Chlorine (TRC) will be based, is the chemical Minimum Quantification Level (ML). For this permit the ML for Total Residual Chlorine is 0.020 mg/l (20.0 ug/l). This value may be reduced by permit modification as more sensitive test methods are approved by the EPA and the NHDES-WD. Any Total Residual Chlorine value below 0.020 mg/l will be reported as zero (nondetect).

8. Toxicity testing results for aluminum and copper may be used as one of the sampling requirements for the monitoring period during which the toxicity test was done. Results should still be reported as daily maximum values for the corresponding toxicity test.
9. 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.

10. 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.
11. C-NOEC (Chronic-No Observed Effect Concentration) is defined as the **highest** concentration of toxicant or effluent to which organisms are exposed in a life-cycle or partial life-cycle test which **causes no adverse effect on growth, survival, or reproduction** at a specific time of observation as determined from hypotheses testing where the test results (growth, survival, and/or reproduction) exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, report the **lowest** concentration where there is no observable effect. The C-NOEC limit of “equal to or greater than 50%” is defined as a sample which is composed of 50% or greater effluent, the remainder being dilution water. This is the minimum percentage of effluent at which no chronic effects will be observed. The limit is considered to be a maximum daily limit.
12. 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).
13. For each whole effluent toxicity test the permittee shall report on the appropriate discharge monitoring report, (DMR), the concentrations of the hardness, total recoverable aluminum, cadmium, copper, lead, nickel, and zinc found in the 100 percent effluent sample. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachment A** on page 7 of 8, or as amended. 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 ensure that the surface water remains free from pollutants in concentrations or combinations that settle to form harmful deposits, float as foam, debris, scum or other visible pollutants. It shall be adequately treated to ensure that the surface waters remain free from pollutants which produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render it unsuitable for its designated uses.

4. The permittee's treatment facility shall maintain a minimum monthly average of 85 percent removal of both CBOD₅ 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 0.265 MGD design flow (0.212 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. 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.

8. 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 NHDES and implemented **within twenty four (24) months from the effective date of this permit**. The Plan shall include:
- (1) The required submittal from paragraph 5.a. above, updated to reflect current information;
 - (2) A preventative maintenance and monitoring program for the collection system;
 - (3) Sufficient staffing to properly operate and maintain the sanitary sewer collection system;
 - (4) Sufficient funding and the source(s) of funding for implementing the plan;
 - (5) Identification of known and suspected overflows and back-ups, including combined manholes, a description of the cause of the identified overflows and back-ups, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
 - (6) A description of the 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 0.265 MGD design flow (0.212 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 & state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.
2. The permittee shall comply with the more stringent of either the state (Env-Wq 800) or federal (40 CFR Part 503) requirements.
3. The requirements and technical standards of 40 CFR Part 503 apply to facilities which perform one or more of the following use or disposal practices.
 - a. Land application - the use of sewage sludge to condition or fertilize the soil.
 - b. Surface disposal - the placement of sewage sludge in a sludge only landfill.
 - c. Sewage sludge incineration in a sludge only incinerator.
4. The 40 CFR Part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions do not apply to facilities which do not dispose of sewage sludge during the life of the permit, but rather treat the sludge (lagoons-reed beds), or are otherwise excluded under 40 CFR Section 503.6.
5. The permittee shall use and comply with the NPDES Permit Sludge Compliance Guidance, November 1999, to determine appropriate conditions. This guidance document is available upon request from EPA Region 1 and may also be found at: <http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf>. Appropriate conditions contain the following elements.
 - General requirements
 - Pollutant limitations
 - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
 - Management practices
 - Record keeping
 - Monitoring

- Reporting

Depending upon the quality of material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction for the permittee's chosen sewage sludge use or disposal practices at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year.
 - less than 290 1/Year
 - 290 to less than 1,500 1/Quarter
 - 1,500 to less than 15,000 6/Year
 - 15,000 plus 1/Month
7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR Section 503.8.
8. The permittee shall submit an annual report containing the information specified in the attached Sludge Compliance Guidance document. Reports are **due annually by February 19th**. Reports shall be submitted to both addresses (EPA-New England and NHDES-WD) contained in the reporting section of the permit.

F. SPECIAL CONDITIONS

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.

G. MONITORING AND REPORTING

1. **For a period of one year from the effective date of the permit**, the permittee may either submit monitoring data and other reports to EPA in hard copy form or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit Discharge Monitoring Reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the**

permit, the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting DMRs and reports. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

a. Submittal of Reports Using NetDMR

NetDMR is accessed from: <http://www.epa.gov/netdmr>. **Within one year of the effective date of this permit**, the permittee shall begin submitting DMRs and reports required under this permit electronically to EPA using NetDMR, unless the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports (“opt-out request”).

DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA, including the NHDES Monthly Operating Reports (MORs), as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA or to NHDES.

b. Submittal of NetDMR Opt-Out Requests

Opt-out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under this permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt-out request and such request is approved by EPA. All opt-out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

And

Attn: Compliance Supervisor
New Hampshire Department of Environmental Services (NHDES)
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

c. Submittal of Reports in Hard Copy Form

Monitoring results shall be summarized for each calendar month and reported on separate hard copy DMRs postmarked no later than the 15th day of the month following the completed reporting period. All reports required under the permit, including NHDES MORs, shall be submitted as an attachment to the DMRs. Signed and dated original DMRs and all other reports (with the exception of pretreatment reports) or notifications required herein or in Part II shall be submitted to the Director at the following address:

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

All pretreatment reports shall be submitted to:

**US Environmental Protection Agency
Attn: Justin Pimpare
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100
OE P06-03
Boston, MA 02109-3912**

Duplicate signed copies of all reports or notifications required above shall be submitted to the State at the following address:

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

Any verbal reports, if required in **Parts I** and/or **II** of this permit, shall be made to both EPA-New England and to NHDES-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-Ws 904.14(e) an “Industrial Wastewater Discharge Request Application” approved by the permittee in accordance with 904.13(a). The “Industrial Wastewater Discharge Request Application” shall be prepared in accordance with Env-Ws 904.10.
8. Pursuant to Env-Ws 904.17, at a frequency no less than every five years, the permittee shall submit to NHDES:
 - a. A copy of its current sewer use ordinance. The sewer use ordinance shall include local limits pursuant to Env-Ws 904.04 (a).
 - b. A current list of all significant indirect dischargers to the POTW. At a minimum, the list shall include for each significant indirect discharger, its name and address, the name and daytime telephone number of a contact person, products manufactured, industrial processes used, existing pretreatment processes, and discharge permit status.
 - c. A list of all permitted indirect dischargers; and
 - d. A certification that the municipality is strictly enforcing its sewer use ordinance and all discharge permits it has issued.
9. In addition to submitting DMRs, monitoring results shall also be summarized for each calendar month and reported on separate Monthly Operations Report Form(s) (MORs) postmarked or submitted electronically using NetDMR no later than the 15th day of the month following the completed reporting period. Signed and dated MORs, which are not submitted electronically using NetDMR shall be submitted to:

New Hampshire Department of Environmental Services (NHDES)

Water Division

Wastewater Engineering Bureau

29 Hazen Drive, P.O. Box 95

Concord, New Hampshire 03302-0095

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6°C.

IV. DILUTION WATER

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

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

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

and

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

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

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

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS¹

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

series.

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

Footnotes:

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

**EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW
(PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST¹**

1. Test Type	Static, non-renewal
2. Temperature (°C)	20 ± 1 ° C or 25 ± 1°C
3. Light quality	Ambient laboratory illumination
4. Photoperiod	16 hr light, 8 hr dark
5. Size of test vessels	250 mL minimum
6. Volume of test solution	Minimum 200 mL/replicate
7. Age of fish	1-14 days old and age within 24 hrs of each other
8. No. of fish per chamber	10
9. No. of replicate test vessels per treatment	4
10. Total no. organisms per concentration	40
11. Feeding regime	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12. Aeration	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13. dilution water ²	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q ^R or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14. Dilution series	≥ 0.5, must bracket the permitted RWC

- | | |
|----------------------------|--|
| 15. Number of dilutions | 5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series. |
| 16. Effect measured | Mortality-no movement on gentle prodding |
| 17. Test acceptability | 90% or greater survival of test organisms in dilution water control solution |
| 18. Sampling requirements | For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection. |
| 19. Sample volume required | Minimum 2 liters |

Footnotes:

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

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

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

Notes:

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

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

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

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

No Observed Acute Effect Level (NOAEL)

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

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

FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL USEPA Region 1

I. GENERAL REQUIREMENTS

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

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

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

II. METHODS

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

III. SAMPLE COLLECTION AND USE

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

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

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

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

IV. DILUTION WATER

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

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

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

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

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

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

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

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

and

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

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

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

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

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

V.1. Use of Reference Toxicity Testing

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

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

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

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

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

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

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

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

VI. CHEMICAL ANALYSIS

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

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

<u>Parameter</u>	Effluent	Receiving Water	ML (mg/l)
Hardness ^{1, 4}	x	x	0.5
Total Residual Chlorine (TRC) ^{2, 3, 4}	x		0.02
Alkalinity ⁴	x	x	2.0
pH ⁴	x	x	--
Specific Conductance ⁴	x	x	--
Total Solids ⁶	x		--
Total Dissolved Solids ⁶	x		--
Ammonia ⁴	x	x	0.1
Total Organic Carbon ⁶	x	x	0.5
Total Metals ⁵			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02

Other as permit requires

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
 - Method 2340B (hardness by calculation)
 - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
 - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
 - Method 4500-CL E Low Level Amperometric Titration
 - Method 4500-CL G DPD Colorimetric Method
 - USEPA 1983. Manual of Methods Analysis of Water and Wastes
 - Method 330.5
 3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
 4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
 5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
 6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

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

2. Test Variability (Test Sensitivity)

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

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

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

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

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

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

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

2. *Pimephales promelas*

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

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

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

3. *Ceriodaphnia dubia*

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

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

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

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

In addition to the summary sheets the report must include:

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

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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NPDES PART II STANDARD CONDITIONS
(January, 2007)

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.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

4. Reopener Clause

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

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

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

5. Oil and Hazardous Substance Liability

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

6. Property Rights

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

7. Confidentiality of Information

- a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words “confidential business information” on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).
- b. Claims of confidentiality for the following information will be denied:
 - (1) The name and address of any permit applicant or permittee;
 - (2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).
- c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

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8. Duty to Reapply

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

9. State Authorities

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

10. Other Laws

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

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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

b. Bypass not exceeding limitations

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

c. Notice

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

d. Prohibition of bypass

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

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

5. Upset

- a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

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

- c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
 - (2) The permitted facility was at the time being properly operated;
 - (3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
 - (4) The permittee complied with any remedial measures required under B.3. above.
- d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
- b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.
- c. Records of monitoring information shall include:
 - (1) The date, exact place, and time of sampling or measurements;
 - (2) The individual(s) who performed the sampling or measurements;
 - (3) The date(s) analyses were performed;
 - (4) The individual(s) who performed the analyses;
 - (5) The analytical techniques or methods used; and
 - (6) The results of such analyses.
- d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.
- e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by

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

2. Inspection and Entry

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

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

- a. **Planned Changes.** The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:
 - (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
 - (2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
 - (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
- b. **Anticipated noncompliance.** The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- c. **Transfers.** This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

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

- d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
- (1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.
 - (2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.
 - (3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.
- e. Twenty-four hour reporting.
- (1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 - (2) The following shall be included as information which must be reported within 24 hours under this paragraph.
 - (a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
 - (b) Any upset which exceeds any effluent limitation in the permit.
 - (c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)
 - (3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

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- f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.
 - g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.
 - h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.
2. Signatory Requirement
- a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)
 - b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.
3. Availability of Reports.

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

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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

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

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

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

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

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

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

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

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

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

Construction Activities - The following definitions apply to construction activities:

- (a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.
- (b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.
- (c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

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

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

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

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

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

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

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

Discharge of a pollutant means:

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

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

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

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

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

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

EPA means the United States “Environmental Protection Agency”.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- (a) From which there is or may be a “discharge of pollutants”;
- (b) That did not commence the “discharge of pollutants” at a particular “site” prior to August 13, 1979;
- (c) Which is not a “new source”; and
- (d) Which has never received a finally effective NPDES permit for discharges at that “site”.

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

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

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

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

NPDES means “National Pollutant Discharge Elimination System”.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- (1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);
- (2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and
- (3) satisfies at least one of the following criteria:
 - (i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
 - (ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
 - (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Waters of the United States means:

- (a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;
- (b) All interstate waters, including interstate “wetlands”;
- (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands”, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
 - (1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;
 - (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
- (d) All impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;
- (f) The territorial sea; and
- (g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

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

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

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

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

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

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

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

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

- (1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and
- (2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl ₂	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

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TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M ³ /day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH ₃ -N	Ammonia nitrogen as nitrogen
NO ₃ -N	Nitrate as nitrogen
NO ₂ -N	Nitrite as nitrogen
NO ₃ -NO ₂	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

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

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

FACT SHEET

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

NPDES PERMIT NO.: NH0101052

PUBLIC NOTICE START AND END DATES: August 15, 2013 thru September 13, 2013

NAME AND MAILING ADDRESS OF APPLICANT:

Town of Troy
P.O. Box 215
Troy, New Hampshire 03465

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Town of Troy Wastewater Treatment Plant
151 Dort Street
Troy, New Hampshire 03465

RECEIVING WATERS:

South Branch of the Ashuelot River (Hydrologic Basin Code: 01080201)

RECEIVING WATER CLASSIFICATION: B

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

The above named applicant has applied to the U.S. Environmental Protection Agency for reissuance of its NPDES permit to discharge into the designated receiving water. The Town of Troy Wastewater Treatment Plant (WWTP) collects and treats domestic and commercial wastewater from the Town of Troy. Secondary treatment is provided by an aerated facultative lagoon system with a design flow of 0.265 mgd. Prior to discharging to the South Branch of the Ashuelot River, the effluent is disinfected using sodium hypochlorite and then dechlorinated. Outfall 001 is approximately located at latitude 42^o 50' 13" and longitude 72^o 10' 46".

The Town's previous permit was issued on November 20, 2002, became effective on January 19, 2003, modified on January 28, 2005, and expired January 19, 2008. The expired permit (hereafter referred to as the "2003 permit") has been administratively extended pursuant to 40 C.F.R. §122.6.

The location of the facility, Outfall 001, and receiving water are shown in Attachment A.

This WWTP went on line in 1983 and sludge was removed from the lagoons for the first time in 2006. It is not anticipated that sludge will be removed from the lagoons during the life of this permit.

II. Description of Discharge

A quantitative description of significant effluent parameters based on Discharge Monitoring Reports (DMRs) is shown in Attachment B. The data are from January 2008 through March 2012.

III. Limitations and Conditions

Effluent limitations, monitoring requirements, and any implementation schedule (if required) are found in PART I of the draft NPDES permit. The basis for each limit and condition is discussed in Section VI of this fact sheet.

IV. Statutory and Regulatory Authority

A. General Statutory and Regulatory Background

Congress enacted the Clean Water Act (CWA or Act), "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except as authorized by specified permitting sections of the Act, one of which is Section 402. See CWA §§ 301(a), 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 Act, 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)-(2).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" limitations and "water quality-based" limitations. See CWA §§ 301,

303, 304(b); 40 C.F.R. Parts 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant-reducing technology available and economically achievable for the type of facility being permitted. See CWA § 301(b). As a class, POTWs must meet performance-based requirements based on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of CBOD₅, TSS, and pH. (see 40 C.F.R. Part 133.)

Water quality-based effluent limits, on the other hand, are designed to ensure that state water quality standards are met regardless of the decision made with respect to technology and economics in establishing technology-based limitations. In particular, Section 301(b)(1)(C) 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 C.F.R. §§ 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") and 122.44(d)(5) (in part providing 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 for all water bodies within the state. CWA § 303. These standards have three parts: (1) one or more "designated uses" for each water body or water body segment in the state; (2) water quality "criteria," consisting of numerical concentrations and/or narrative statements specifying the amounts of various pollutants that may be present in each water body without impairing the designated uses of that water body; and (3) an antidegradation provision, focused on protecting high quality waters and protecting and maintaining water quality necessary to protect existing uses. CWA § 303(c)(2)(A); 40 C.F.R. § 131.12. The limits and conditions of the permit reflect the goal of the CWA and EPA to achieve and then to maintain water quality standards.

The applicable New Hampshire water quality standards can be found in 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. Hereinafter, New Hampshire's Surface Water Quality Regulations are referred to as the NH Standards.

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

All statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired. When technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. See 40 C.F.R. § 125.3(a)(1). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit.

The regulations governing EPA's NPDES permit program are generally found in 40 C.F.R. Parts 122, 124, 125 and 136.

B. Development of Water Quality-based Limits

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality standard, including narrative water quality criteria. See 40 C.F.R. § 122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion.

In determining reasonable potential, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from the permit application, monthly discharge monitoring reports (DMRs), and State and Federal water quality reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in *Technical Support Document for Water Quality-based Toxics Controls*, March 1991, EPA/505/2-90-001 in Section 3; and, where appropriate, (5) dilution of the effluent in the receiving water. In accordance with New Hampshire water quality standards (RSA 485-A:8, VI, 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. Available dilution for tidal waters is based on conditions that result in dilution that is exceeded 99 percent of the time. Furthermore, for all waters, 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.

C. Anti-Backsliding

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. Except under certain limited circumstances, "backsliding" from effluent limitations contained in previously issued permits is prohibited. EPA has also promulgated anti-backsliding regulations, which are found at 40 C.F.R. § 122.44(l).

D. State Certification

Section 401(a)(1) of the CWA requires all NPDES permit applicants to obtain a certification from the appropriate state agency stating that the permit will comply with all applicable federal effluent limitations and state water quality standards. See CWA § 401(a)(1). The regulatory provisions pertaining to state certification provide that EPA may not issue a permit until a certification is granted or waived by the state in which the discharge originates. 40 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 incorporates 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 water quality standards, 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 water quality standard 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 regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." Id. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 C.F.R. § 122.4 (d) and 40 C.F.R. § 122.44(d).

V. Description of Receiving Water

The South Branch of the Ashuelot River is the receiving water and is classified as Class B water by the New Hampshire State Legislature. Designated uses for the receiving water are: protection and propagation of aquatic life and wildlife, fish consumption, drinking water supply after adequate treatment, and primary and secondary contact recreation.

The State of New Hampshire's *Final – 2010 List of Threatened or Impaired Waters that Require a TMDL* includes a listing for the South Branch of the Ashuelot River (Assessment Unit ID: NHRIV802010303-18). This list, prepared pursuant to CWA section 303(d) identifies this segment of the South Branch of the Ashuelot River as not supporting aquatic life as a result of pH and not supporting primary contact recreation as a result of *Escherichia Coli* bacteria.

VI. Permit Basis and Explanation of Effluent Limitation Derivation

A. Flow

Influent and effluent flow must be continuously monitored. If the effluent discharged for a period of three consecutive months exceeds 80 percent of the 0.265 mgd design flow (0.212 mgd), the permittee must notify EPA and NHDES-WD, and implement a program for maintaining satisfactory treatment levels. See Part I.A.5 of the proposed draft permit.

B. Conventional Pollutants

1. Carbonaceous Biochemical Oxygen Demand and Total Suspended Solids

The monthly average and weekly average concentration-based limits for CBOD₅ and TSS are based on requirements under Section 301(b)(1)(B) of the CWA as defined for secondary treatment standards in 40 C.F.R. § 133.102(a) and (b). The average monthly and average weekly mass-based limits for CBOD₅ and TSS in the draft permit are based on 40 C.F.R. § 122.45(f) which requires the Agency to include mass-based limits. See Attachment C for the equation used to calculate each of these mass-based limits. Average monthly and maximum daily limitations for CBOD₅ and TSS remain the same as in the 2003 permit, consistent with antibacksliding requirements found in 40 C.F.R. § 122.44(1), and the permittee has been able to achieve consistent compliance with these limits.

2. Escherichia coli

The limit for *Escherichia coli* bacteria (*E. coli*) is based on requirements in the State's Statutes (N.H. RSA 485-A:8) for non-designated beach area, and Env-Wq 1703.06 (b), which requires that bacteria criteria shall be applied at the end of a wastewater treatment facility's discharge pipe. The permittee has been able to achieve compliance with these limits, reporting only 3 violations of the maximum daily limit and zero violations of the monthly average limit from January 2008 to March 2012 (see Attachment B).

The compliance monitoring frequency for *E. coli* in the draft permit is 2/week. Samples for *E. coli* compliance monitoring must be taken concurrently with samples for total residual chlorine.

3. pH

The pH limit range of 6.5 - 8.0 Standard Units (S.U.) in the draft permit remains unchanged from the 2003 permit. The limit for pH is based upon State Certification Requirements and RSA 485-A:8, which states that "The pH range for said (Class B) waters shall be 6.5 to 8.0 except when due to natural causes." The permittee has been able to achieve compliance with these limits, reporting only 1 violations of the upper limit and zero violations of the lower limit from January 2008 to March 2012 (see Attachment B).

The compliance monitoring frequency for pH in the draft permit is 1/day.

The draft permit includes a provision allowing a relaxation of the pH limits if the permittee performs a dilution study that demonstrates that the in-stream standards for pH would be protected. If the State approves results from a pH demonstration study, this permit's pH limit range may be relaxed. The notification of the relaxation must be made by certified letter to the permittee from EPA-New England. The pH limit range cannot be less restrictive than 6.0 - 9.0 S.U., the limitations included in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for the facility.

C. Non-Conventional and Toxic Pollutants

Water-quality based limits for specific toxic pollutants such as chlorine, ammonia, and metals are, in most cases, determined from numeric chemical specific criteria derived from extensive scientific studies. The EPA has summarized and published specific toxic pollutants and their associated toxicity criteria in Quality Criteria for Water, 1986, EPA440/5-86-001 as amended, commonly known as the federal "Gold Book". Each pollutant generally includes acute aquatic life criteria to

protect against short term aquatic life effects, such as death; chronic aquatic life criteria to protect against long term aquatic life effects, such as poor reproduction or impaired growth; and human health criteria to protect water and fish consumption uses. New Hampshire adopted these “Gold Book” criteria, with certain exceptions, and included them as part of the State’s Surface Water Quality Regulations adopted on December 10, 1999. EPA uses these pollutant-specific criteria along with available dilution in the receiving water to determine pollutant specific draft permit limits.

1. Available Dilution

The available dilution for the Troy WWTP for the 2003 permit was determined to be 2.00. This was based upon the treatment plant’s design flow of 0.265 mgd (0.41 cfs) and the 7Q10 flow of the South Branch of the Ashuelot River at the treatment plant’s outfall of 0.91 cfs (0.58 mgd). Also, pursuant to Env-Wq-1705.01, the available dilution calculation holds 10% of the assimilative capacity of the receiving water in reserve for future needs.

Since no direct flow measurements are available for the South Branch of the Ashuelot River at the treatment plant’s outfall, the 7Q10 flow was calculated using the flows measured at a downstream USGS gage as well as an empirical equation developed by Dingman¹. This equation estimates 7Q10 stream flow in ungaged, unregulated streams in New Hampshire and Vermont as a function of watershed characteristics. See Attachment C for 7Q10 and dilution calculations.

Based upon these calculations, the dilution factor of **2.0** has been carried forward in this draft permit.

2. Total Residual Chlorine

The New Hampshire water quality standards specify the chronic and acute aquatic-life criterion for chlorine at 0.011 mg/l and 0.019 mg/l, respectively, for freshwater. Chlorine and chlorine compounds, such as “organochlorines”, produced by the chlorination of wastewater can be extremely toxic to aquatic life. Section 101(a)(3) of the Act, and New Hampshire standards at Env-Ws 1703.21(a) prohibit the discharge of toxic pollutants in toxic amounts. The equation used to determine the TRC limits is shown in Attachment C. Based on those equations, the TRC limits in the draft permit are 0.02 mg/l (monthly average) and 0.04 mg/l (daily maximum).

Effluent limitations for TRC in the draft permit are the same as the limits in the 2003 permit and, therefore, are in accordance with antibacksliding requirements found in 40 CFR §122.44(1). The applicant has been able to achieve consistent compliance with these limitations, having only one violation of the daily maximum limit from January 2008 to March 2012 (see Attachment B).

3. Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. An evaluation of the concentration of metals in the facility’s effluent (from Whole Effluent Toxicity reports submitted between January 2008 and March 2012) was used to determine reasonable potential for effluent

¹ Dingman, S.L., and S.C. Lawlor, 1995. Estimating Low-Flow Quantiles from Drainage-Basin Characteristics i0.035n New Hampshire and Vermont, American Water Resources Association, Bulletin, pp. 243-256.0.018

discharges to cause exceedances of the water quality criteria for aluminum, cadmium, chromium, copper, lead, nickel and zinc.

Metals may be present in both dissolved and particulate forms in the water column. Extensive studies suggest that it is the dissolved fraction that is biologically available, and therefore, presents the greatest risk of toxicity to aquatic life inhabiting the water column. (Water Quality Standards Handbook: Second Edition, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-05a], <http://www.epa.gov/waterscience/standards/handbook/chapter03.html#section6>). As a result, water quality criteria are established in terms of dissolved metals. However, regulations at 40 CFR 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals. This accounts for the potential for a transition from the particulate to dissolved form as the effluent mixes with the receiving water (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007])).

For metals with hardness-based water quality criteria, the criteria were determined using the equations in NH standards Env-Wq 1703.24, using the appropriate factors for the individual metals found in the NH Standards (see table below). The downstream hardness was calculated to be 27.9 mg/l as CaCO₃, using a mass balance equation with the design flow, receiving water 7Q10, an upstream median hardness of 10 mg/l as CaCO₃ and an effluent median hardness of 50 mg/l as CaCO₃. Since this downstream hardness is above 25 mg/l, it was used to determine the total recoverable metals criteria. The following table presents the factors used to determine the acute and chronic total recoverable criteria for each metal:

Metal	Parameters				Total Recoverable Criteria	
	m_a	b_a	m_c	b_c	Acute Criteria (CMC)* (ug/L)	Chronic Criteria (CCC)** (ug/L)
Aluminum	--	--	--	--	750	87
Cadmium	1.1280	-3.6867	0.7852	-2.7150	1.07	0.90
Chromium III	0.819	3.7256	0.819	0.6848	633.81	30.29
Copper	0.9422	-1.7000	0.8545	-1.702	4.20	3.13
Lead	1.273	-1.46	1.273	-4.705	16.08	0.63
Nickel	0.846	2.255	0.846	0.0584	159.34	17.72
Zinc	0.8473	0.884	0.8473	0.884	40.62	40.62

* Acute Criteria (CMC) = $\exp\{m_a \cdot \ln(\text{hardness}) + b_a\}$

** Chronic Criteria (CCC) = $\exp\{m_c \cdot \ln(\text{hardness}) + b_c\}$

In order 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.

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

rewritten as:

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

where:

Q_d = effluent flow (design flow = 0.265 mgd = 0.41 cfs)

C_d = effluent metals concentration in ug/L (maximum reported²)

Q_s = stream flow upstream ($Q_s = Q_r - Q_d = 0.91 \text{ cfs} - 0.41 \text{ cfs} = 0.50 \text{ cfs}$)

C_s = median upstream metals concentration in ug/L

Q_r = stream flow downstream, after discharge (7Q10 upstream = 0.91 cfs)

C_r = downstream pollutant concentration in ug/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 the table below for the results of this analysis with respect to aluminum, cadmium, chromium, copper, lead, nickel and zinc.

² Note that for sample sizes less than 10, the maximum reported effluent value is used for C_d . For samples sizes of 10 or greater, the 95th percentile of the effluent is calculated and used for C_d .

Metal	Qd	Cd ¹ (Max)	Qs = Qr - Qd	Cs ² (Median)	Qr	Cr = (QdCd+QsCs)/Qr	Total Recoverable Criterion * 0.9		Reasonable Potential	Limit = (Qr*Criterion*0.9- QsCs)/Qd	
							Acute (ug/l)	Chronic (ug/l)		Cr > Criteria	Acute (ug/l)
Aluminum	0.41	50	0.5	190	0.91	126.9	675	78.3	Chronic ³	N/A	N/A
Cadmium		0		0		0	0.963	0.813	N	N/A	N/A
Chromium		0		0		0	570.43	27.26	N	N/A	N/A
Copper		16		8.5		11.88	3.78	2.82	Acute and Chronic	4.2 ⁴	3.1 ⁴
Lead		0		0.3		0.16	14.47	0.56	N	N/A	N/A
Nickel		4		1.5		2.63	143.40	15.94	N	N/A	N/A
Zinc		23		15		18.6	36.56	36.56	N	N/A	N/A

¹ Values represent the maximum measured concentration from the four annual toxicity measurements from the 2008-2011 WET testing noted above (see Attachment F).

² Median upstream data taken from the four WET testing results on the South Branch of the Ashuelot River just upstream of the Troy WWTF (see Attachment B).

³ Although the downstream concentration (C_r) for Al was determined to be above the chronic criterion, there is no reasonable potential for Troy to cause or contribute to that exceedance because the maximum reported effluent value was below the criterion.

⁴ Since the median background copper concentration and the maximum effluent from the facility both exceed the criteria, the copper limits are set at the criteria.

As indicated in the table above, based on the maximum measured effluent concentrations and median upstream concentrations there is no reasonable potential (for either acute or chronic conditions) that the discharge of aluminum, cadmium, chromium, nickel, lead or zinc will cause or contribute to an exceedance of the applicable water quality criteria. However, there is reasonable potential for copper (acute and chronic) to cause or contribute to an exceedance. Hence, the draft permit contains a maximum daily copper limit of 4.2 ug/l and a monthly average copper limit of 3.1 ug/l.

Because of the small sample size, EPA performed additional statistical analyses of the effluent metals data to determine whether increased sampling should be included for any metal to ensure a more robust data set for the next permit issuance. Using a methodology from the *Technical Support Document for Water Quality-based Toxics Control* (“the TSD”), EPA calculated a projected upper bound of effluent concentrations based on a statistical analysis of the facility’s effluent data from its whole effluent toxicity tests and used this value to estimate a downstream concentration for each metal analyzed. The statistical analysis used on the effluent data accounts for the fact that maximum measured concentration may not correspond to the true upper bound of effluent concentrations, particularly for small samples sizes (n<10) as are available here. This analysis accounts for the uncertainty that arises from small sample sizes by characterizing 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 (95th percentile) concentration at that confidence level. EPA uses a 95 percent confidence level for this characterization. See Attachment F 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. This is summarized in the table below.

Metal	Qd	Cd ¹ (Upper bound)	Qs = Qr - Qd	Cs ² (Median)	Qr	Cr = (QdCd+QsCs)/Q _R	Total Recoverable Criterion * 0.9		Criteria Exceeded?
	cfs	ug/l	cfs	ug/l	cfs	ug/l	Acute (ug/l)	Chronic (ug/l)	Cr > Criteria
Aluminum	0.41	130	0.50	190	0.91	163.0	675	78.3	Chronic
Cadmium		0		0		0	0.963	0.813	No
Chromium		0		0		0	570.43	27.26	No
Copper		41.6		8.5		23.4	3.78	2.82	Acute and Chronic
Lead		0		0.3		0.16	14.47	0.56	No
Nickel		10.4		1.5		5.5	143.40	15.94	No
Zinc		59.8		15		35.2	36.56	36.56	No

¹ Values calculated using procedures in Attachment F, using the four annual toxicity measurements from the 2008-2011 WET testing noted above

² Median upstream data taken from WET testing results on the South Branch of the Ashuelot River just upstream of the Troy WWTF (see Attachment B).

As shown, the upper bound of the effluent data (as opposed to the maximum measured concentration) indicates that in addition to copper exceedances there is uncertainty regarding whether the discharge of aluminum from this facility may pose a concern. Hence, in an effort to better characterize the discharge and provide a more robust data set for future permitting decisions, quarterly monitoring is being required for total recoverable aluminum as indicated in the draft permit. If future monitoring of Al indicates that the discharge has reasonable potential to cause or contribute to an exceedance of the Al criterion, future permitting actions may require a limit for Al. Additionally, monitoring and reporting for all metals will continue to be required as part of the WET tests.

4. Total Phosphorus

Phosphorus and other nutrients (i.e. nitrogen) can promote the growth of nuisance 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 instream dissolved oxygen concentrations to levels that could negatively impact aquatic life and/or produce strong unpleasant odors.

EPA has produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The 1986 Quality Criteria for 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 discharging 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 was 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 which are minimally impacted by human activities, and thus are representative of waters without cultural eutrophication. Troy and the South Branch of the Ashuelot River are located in Ecoregion VIII, *Nutrient Poor Largely Glaciated Upper Midwest and Northeast*. Recommended criteria for this ecoregion are a total phosphorus concentration of 10 ug/l (0.01 mg/l) and a chlorophyll *a* concentration of 0.63 ug/l (0.00063 mg/l). These recommended criteria are found in *Ambient Water Quality Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII* (USEPA 2001).

More recently, Mitchell, Liebman, Ramseyer, and Card (in draft 2004), in conjunction with the New England States, developed a potential nutrient criteria for rivers and streams in New England. Using several river examples representative of typical conditions for New England, they investigated several approaches for the development of river and stream nutrient criteria that would be dually protective of designated uses in both upstream reaches and downstream impoundments. Based on this investigation an instream total phosphorus concentration of 0.020 – 0.022 mg/l was identified as protective of designated uses for New England rivers and streams. The development of the New England-wide total phosphorus concentration was based on more recent data than the National Ecoregional nutrient criteria, and has been subject to quality assurance measures. Additionally, the development of the New England-wide concentration included reference conditions for waters presumed to be protective of designated uses.

The New Hampshire Surface Water Quality Regulations contain a narrative criterion which states that phosphorus contained in an effluent shall not impair a water body’s designated uses. Specifically, Env-Ws 1703.14(b) states, “Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring.” Env-Ws 1703.14(c) further states, “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-Ws 1702.15 as, “...the human-induced addition of wastes containing nutrients to surface waters which results in excessive plant growth and/or a decrease in dissolved oxygen.”

Section 303(d) of the Clean Water Act requires States to identify those waterbodies that are not expected to meet surface water quality standards after implementation of technology-based controls and thus require the development of total maximum daily loads (TMDLs). The South Branch of the Ashuelot River has not been listed on the 303(d) list as impaired for phosphorus or other eutrophication indicators. Although the river is not on the 303(d) list for instream oxygen concentrations, the South Branch of the Ashuelot River provides very little dilution (dilution factor of 2.0) and there are existing dissolved oxygen impairments on the 303(d) list for the main stem of the Ashuelot River (near the confluence with the South Branch of the Ashuelot River). As a result, the NHDES initiated a TMDL for the river based on DO concerns. The sampling for the TMDL was performed in August and September of 2005 and among the parameters sampled were dissolved oxygen, dissolved oxygen saturation, total phosphorus, orthophosphate, and chlorophyll 'a'. The results of the sampling are summarized below. Note that the stations are presented in geographical order from upstream to downstream, SBA designates a station on the South Branch of the Ashuelot River, NH0101052 designates the effluent of the Troy WWTP, and other designations are tributaries to the South Branch of the Ashuelot River. The sampling stations are shown in Attachment E.

South Branch of the Ashuelot TMDL Sampling Data -August 25, 2005								
Station	TP (mg/l)	Ortho P (mg/l)	D.O. (mg/l)		D.O. (% Sat)		Chlor 'a' (ug/l)	Periphyton (% Cover)
			AM	PM	AM	PM		
08-SBA	0.021	<0.01	6.10	6.32	64.0	70.4	1.23	0 – 33
07Y-SBA	0.021	<0.01	6.93	6.40	72.7	71.0	2.14	0 – 33
NH0101052	5.96	5.88	7.22	6.50	81.5	74.3	9.86	---
07U-SBA	0.179	0.148	6.93	6.88	72.4	76.2	1.78	0 – 33
07S-SBA	0.185	0.145	6.94	7.38	72.1	82.0	2.32	0 – 33
01-SHK	0.025	0.008	7.36	8.55	73.4	92.3	2.30	67 - 100
07R-SBA	0.123	0.088	7.16	8.55	76.6	93.8	2.23	34 – 66
06P-SBA	0.093	0.063	7.91	7.56	79.2	83.4	2.52	0 – 33
06-SBA	0.08	0.051	8.28	6.84	82.4	75.4	2.30	0 – 33
02-FBR	0.016	0.008	7.54	8.20	73.1	84.3	2.35	0 – 33
05K-SBA	0.048	0.021	7.32	9.12	73.1	99.6	1.92	0 – 33
02-BRG	0.007	<0.01	8.62	8.21	82.3	82.5	0.5	0 – 33
04F-SBA	0.032	<0.01	7.13	8.50	73.0	95.5	4.24	0 – 33
04B-SBA	0.031	<0.01	7.26	8.42	74.7	95.4	3.7	0 – 33
01-MAB	0.016	<0.01	6.15	7.62	63.3	84.8	1.28	0 – 33
03X-SBA	0.024	<0.01	6.85	8.05	70.5	90.0	1.46	0 – 33
03-SBA	0.026	<0.01	6.35	8.58	65.2	95.1	2.91	0 – 33
02-SBA	0.021	<0.01	6.93	7.63	71.2	83.5	2.57	0 – 33

South Branch of the Ashuelot TMDL Sampling Data -September 14, 2005								
Station	TP (mg/l)	Ortho P (mg/l)	D.O. (mg/l)		D.O. (% Sat)		Chlor 'a' (ug/l)	Periphyton (% Cover)
			AM	PM	AM	PM		
08-SBA	0.057	<0.01	6.94	7.26	73.0	82.7	---	34 – 66
07Y-SBA	0.025	<0.01	7.10	6.99	75.0	79.7	---	34 – 66
NH0101052	6.07	5.55	7.53	7.43	84.9	85.5	28.19	---
07U-SBA	0.441	0.398	6.71	7.57	70.8	86.1	3.07	34 – 66
07S-SBA	0.503	0.417	6.23	7.64	65.9	86.7	4.86	67 – 100
01-SHK	0.022	<0.01	8.11	8.36	83.8	96.6	1.78	0 – 33

07R-SBA	0.281	0.229	8.15	8.55	85.1	97.8	2.51	---
06P-SBA	0.21	0.173	8.22	7.66	85.9	86.6	1.97	67 – 100
06-SBA	0.172	0.128	8.61	8.47	90.1	97.6	1.45	0 – 33
02-FBR	0.024	0.013	7.22	7.77	73.7	82.2	1.64	0 – 33
05K-SBA	0.09	0.066	7.35	8.02	77.0	90.7	1.45	34 – 66
02-BRG	0.008	<0.01	8.94	8.94	88.2	94.0	0.33	0 – 33
04F-SBA	0.0285	<0.01	7.24	9.61	77.9	110.9	5.21	0 – 33
04B-SBA	0.029	0.016	6.80	8.36	73.2	97.0	4.22	0 – 33
01-MAB	0.015	<0.01	5.48	6.89	59.0	79.0	0.90	0 – 33
03X-SBA	0.022	<0.01	6.67	7.66	71.9	88.3	2.81	0 – 33
03-SBA	0.022	<0.01	6.18	8.17	67.4	93.8	2.54	0 – 33
02-SBA	0.018	<0.01	6.25	7.96	66.6	89.9	2.35	0 – 33

Sampling station 07Y-SBA is located 10 feet upstream of the Troy WWTP and measured instream phosphorus concentrations were 0.021 and 0.025 mg/l on August 25 and September 14, respectively. On August 25, instream phosphorus concentrations downstream of the Troy WWTP exceeded the Gold Book total phosphorus target of 0.1 mg/l down to sampling station 07R-SBA. On September 14, the Gold Book target was exceeded downstream of the Troy WWTP down to sampling station 06-SBA. The ecoregional TP criterion of 0.01 mg/l and the chlorophyll 'a' criterion of 0.63 ug/l were exceeded at all sampling locations on the South Branch of the Ashuelot River on both sampling dates. On the first sampling date (August 25, 2005), the periphyton coverage increased significantly at a location within 1 mile downstream of the discharge (07R-SBA). On the second sampling date (September 14, 2005), the periphyton coverage increased significantly at a location within 1 mile downstream of the discharge (07S-SBA) as well as at a location within 2 miles downstream (06P-SBA). On September 14, 2005, the DO and DO saturation measurements also appear to be affected at locations within 1 mile of the discharge. However, continuous DO monitoring would be required to determine whether DO and DO saturation criteria were violated.

When analyzing both effluent and instream total phosphorus data, EPA-New England has chosen to apply the Gold Book criterion rather than the more stringent ecoregional or New England criteria. The decision was made due to the fact that the Gold Book criterion was developed from an effects-based approach versus the ecoregional and New England 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.

In addition to the sampling data above, the permittee was required to report maximum daily and monthly average phosphorus effluent concentrations from May through September of each year. As shown in Attachment B, the average discharge of phosphorus during the review period (January 2008 to March 2012) was 5.27 mg/L (monthly average) and 5.93 (maximum daily). These concentrations are comparable to the effluent data presented above from the sampling done in 2005, and confirm that the discharge has consistently contributed to the phosphorus load in the receiving water.

Based upon this analysis, the increase in TP above the Gold Book target combined with the significant increase in periphyton coverage downstream of the discharge indicate that the effluent from the Troy WWTP has the reasonable potential to cause or contribute to nutrient-related water quality impairments within the South Branch of the Ashuelot River. To address this potential, a mass-based effluent limit for phosphorus has been established in the draft permit. To ensure this mass-based limit is protective under worst-case conditions, the limit is calculated using the lowest expected receiving water flow and effluent flow. Hence, the upstream 7Q10 receiving water flow (0.91 cfs, or 0.59 mgd) and the lowest monthly average effluent flow during the review period (0.047 mgd, see Attachment B) are used. The upstream phosphorus concentration was determined to be 0.023 mg/l, the median of the two samples taken from the closest upstream monitoring location presented in the tables above (0.021 ug/l and 0.025 ug/l from Station 07Y-SBA). The numeric mass-based limit is determined based upon the following equations:

$$Q_d C_d + Q_s C_s = Q_r C_r (0.90)$$

and

$$M_d = Q_d C_d * 8.345$$

where:

M_d = mass-based phosphorus limit

Q_d = effluent flow (lowest effluent monthly average flow = 0.047 mgd)

C_d = effluent phosphorus concentration in mg/L

Q_s = stream flow upstream ($Q_s = Q_r - Q_d = 0.588 \text{ mgd} - 0.047 \text{ mgd} = 0.541 \text{ mgd}$)

C_s = median upstream phosphorus concentration (0.023 mg/l)

Q_r = stream flow downstream, after discharge (downstream 7Q10 = 0.91 cfs or 0.588 mgd)

C_r = downstream pollutant concentration (Gold Book target: 0.100 mg/l)

0.90 = Factor to reserve 10 % assimilative capacity

8.345 = Factor to convert from $mgd * mg/l$ to lb/d

These equations can be combined as:

$$M_d = Q_d C_d * 8.345 = [Q_r C_r (0.90) - Q_s C_s] * 8.345$$

Solving for M_d gives the maximum allowable phosphorus load which the facility may discharge without violating water quality standards. This allowable load is:

$$M_d = [(0.588 * 0.1 * 0.9) - (0.541 * 0.023)] * 8.345 = \mathbf{0.34 \text{ lb/d}}$$

The mass-based phosphorus limit of 0.34 lb/d is applied seasonally, from April 1st through October 31st, as a monthly average limit to be monitored once per week, as indicated in the draft permit.

5. Ammonia Nitrogen as N

The 2003 permit (as modified in 2005) included average monthly limits for ammonia nitrogen as N of 29.2 lb/day (13.2 mg/l) during winter months (October 1 – April 30) and 19.2 lb/day (8.7 mg/l)

during summer months (May 1 – September 30). These limits were based on the *1999 Update of Ambient Water Quality Criteria for Ammonia* using an average pH of 6.57 and temperatures of 21.2°C (summer) and 10°C (winter). Sampling was required once per week. As shown in Attachment B, from January 2008 through March 2012 (51 months) the facility has shown consistent compliance with these limits, reporting only 4 summer violations and 1 winter violation.

The 2003 permit also describes that the facility did not have reasonable potential to exceed the acute criterion for ammonia nitrogen as N of 47.4 mg/l. However, daily maximum reporting was required. The DMR summary (Attachment B) confirms this assessment by showing that the highest daily maximum value reported during the review period was 21.0 mg/l. Hence, there is no reasonable potential that the discharge would cause an in-stream exceedence of the acute criterion.

In addition, sampling of the receiving water upstream of the discharge was conducted once per year as part of chemical-specific sampling performed in conjunction with whole effluent toxicity testing. The four tests from September 2008 through September 2011 show that the ammonia concentration in the receiving water upstream of the discharge is reported as zero, with a detection limit of 0.1 mg/l.

Based upon this analysis, EPA has decided to carry forward the chronic limits for ammonia nitrogen as N in both the summer and winter months. The limits will ensure that the discharge of ammonia does not cause or contribute to a violation of New Hampshire's Water Quality Standards. Additionally, the facility will continue to be required to monitor daily maximum ammonia nitrogen concentrations once per week, as specified in the draft permit.

Average monthly mass-based limitations for ammonia nitrogen as N shown in the draft permit are based on the concentration-based limit and the POTW's daily design flow. See Attachment C for the equation used to calculate each of these mass-based limits.

The draft permit requires sampling for ammonia once per week.

6. Total Nitrogen

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

The baseline total nitrogen point source loadings estimated for the Connecticut, Housatonic, and Thames River watersheds were 21,672 lbs/day, 3,286 lbs/day, and 1,253 lbs/day, respectively (see table below). The estimated current point source total nitrogen loadings for the Connecticut, Housatonic, and Thames Rivers respectively are 13,836 lbs/day, 2,151 lbs/day, and 1,015 lbs/day. The following table summarizes the estimated baseline loadings, TMDL target loadings, and estimated current loadings:

Basin	Baseline Loading¹ (lbs/day)	TMDL Target² (lbs/day)	Current Loading³ (lbs/day)
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,002

1. Estimated loading from TMDL, (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound", April 1998)
2. Reduction of 25% from baseline loading.
3. Estimated current loading from 2004-2005 DMR data. Detailed summary shown in Attachment D.

The TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met. In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25 percent reduction over baseline loadings, EPA intends to include nitrogen-related conditions in permits for existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds. For facilities discharging loads equal to or greater than 35 lb/day total nitrogen, permit conditions will require the optimization of nitrogen removal with the existing treatment technology. For existing facilities discharging less than 35 lb/day, monitoring of nitrogen discharges will be required. This is consistent with the approach applied by the Connecticut Department of Environmental Protection, which applied a threshold of 20 lbs/day (equivalent in impact to a 35 lb/day threshold at facilities upstream in MA and NH) when imposing nitrogen controls on existing facilities. See Nitrogen Control for Small Sewage Facilities (CT DEP); General Permit for Nitrogen Discharges (CT DEP 2005).

The estimated current loading for the Troy WWTP used in the above analysis was 16.3 lb/day, based upon an estimated total nitrogen concentration of 19.6 mg/l and the average flow of 0.10 MGD (19.6 mg/L * 0.10 MGD * 8.34). A review of the DMRs from January 2008 through March 2012 indicates that monthly average ammonia-N loading varies from 0.1 lb/day to 15.4 lb/day with an average value of 3.74 lb/day. Note that total nitrogen was not monitored during this period. The estimated total nitrogen loading is well below the threshold of 35 lbs/day, therefore, no optimization requirement has been included in the draft permit.

The draft permit requires monthly effluent monitoring of total nitrogen, total Kjeldahl nitrogen, and nitrate + nitrite.

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

D. Whole Effluent Toxicity

EPA's Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 1991, recommends using an "integrated strategy" containing both a pollutant (chemical) specific approach and a whole effluent (biological) toxicity approach to control toxic pollutants from entering the nation's waterways from permitted discharges. EPA-New England adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. Both approaches are designed to protect aquatic life and human health.

Pollutant- specific approaches to control toxics, such as those in the Gold Book and State regulations, address individual chemicals, whereas, a whole effluent toxicity (WET) approach to toxics control evaluates interactions between pollutants, thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. Furthermore, WET measures the "additivity" and/or "antagonistic" effects of individual chemical pollutants while pollutant specific derived permit limits do not, thus the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through the process of WET testing.

New Hampshire law states that, "all surface 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;...." (N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-Wq 1703.21(a)(1)). The federal NPDES regulations at 40 C.F.R. §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when a discharge has a "reasonable potential" to cause or contribute to an excursion above the State's narrative criterion for toxicity.

EPA-New England'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-New England's policy requires that secondary treatment facilities with a dilution factor less than 10 meet an acute toxicity limit of LC₅₀ of 100 percent effluent, and a chronic (no observed effects) toxicity limit equal to the receiving water concentration. Therefore, the draft permit includes both LC₅₀ and C-NOEC limits.

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 organism must survive in a sample of 100 percent effluent.

The Chronic-No Observed Effect Concentration (C-NOEC) is defined as the highest concentration to which test organisms are exposed in a life cycle or partial life cycle test, which causes no adverse effect on growth, survival, or reproduction during a specific time of observation. Based on the dilution factor for the Troy WWTF, the C-NOEC limit has been calculated as follows;

$$\frac{1}{DilutionFactor} * 100\% = \frac{1}{2.0} * 100\% = 50\%$$

The test results (growth, survival or reproduction) at a specific time of observation as determined from hypothesis testing should exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the draft permit requires the permittee to report the lowest concentration where there is no observable effect.

The effluent limitations in the draft permit for both LC50 and C-NOEC are the same as the 2003 permit. 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 from July 1st through September 30th.

The WET limits in the draft permit include conditions to allow EPA-New England to modify, or alternatively, revoke and reissue the permit to incorporate additional toxicity testing requirements, including chemical specific limits, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered “New Information” and the permit may be modified as provided in 40 C.F.R. §122.62(a)(2). Alternately, if a permittee has consistently demonstrated that its discharge, based on data for the most recent one-year period, or four sampling events, whichever yields the greater time period, causes no acute and chronic toxicity, the permitted limits will be considered eligible for a reduced frequency of toxicity testing. Tests must be valid and must demonstrate compliance with the permit limits for whole effluent toxicity, and the permittee must submit a written request to EPA-New England seeking a review of the toxicity test results. This reduction in testing frequency is evaluated on a case-by-case basis. Accordingly, a special condition has been carried forward from the existing permit into the draft permit that allows for a reduced frequency of WET testing using a certified letter from EPA-New England. This permit provision anticipates the time when the permittee requests a reduction in WET testing that is approvable by both EPA New England and the NHDES-WD. EPA-New England’s policy is to reduce the frequency of toxicity testing to no less than once per year. The permittee is required to continue testing at the frequency specified in the permit until the permit is either formally modified or until the permittee receives a certified letter from the EPA-New England indicating a change in the permit condition. This special condition does not negate the permittee’s right to request a permit modification at any time prior to the permit expiration.

This draft permit, as in the 2003 permit, requires the permittee to continue reporting selected parameters from the chemical analysis of the WET tests’ 100 percent effluent sample. Specifically, hardness, ammonia nitrogen as nitrogen, and total recoverable aluminum, cadmium, lead, nickel and zinc are to be reported on the appropriate DMR for entry into EPA's data base. EPA-New England does not consider these reporting requirements an unnecessary burden as reporting these constituents is already required with the submission of each toxicity testing report.

E. Sludge

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

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA-New England has prepared a 72-

page document entitled “EPA Region I 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 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.

The Troy WWTF uses aerated lagoons where sludge accumulates over a period of years. This plant went on line in 1983 and sludge was removed from the lagoons for the first time in 2006. The sludge (54.4 dry metric tons) was disposed of at Resource Management, Inc. in Ashland, NH. It is not anticipated that sludge will be removed from the lagoons during the life of this permit.

F. Industrial Users (Pretreatment Program)

The permittee is not required to administer a pretreatment program pursuant to 40 C.F.R. §122.44(j), 40 C.F.R. §403 and Section 307 of the Act. However, the draft permit contains conditions that are necessary to allow EPA and NHDES-WD to ensure that pollutants from industrial users will not pass through the facility and cause water quality standards violations and/or sludge use and disposal difficulties or cause interference with the operation of the treatment facility. The permittee is required to notify EPA and NHDES-WD whenever a process wastewater discharge to the facility from a primary industrial category (see 40 C.F.R. §122 Appendix A for list) is planned 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 contains the requirements to: 1) report to EPA and NHDES-WD the name(s) of all Industrial Users subject to Categorical Pretreatment Standards (see 40 C.F.R. §403 Appendix C for list) who commence discharge to the POTW after the effective date of the finally issued permit, and 2) submit copies of Baseline Monitoring Reports and other pretreatment reports submitted by industrial users to EPA and NHDES-WD.

G. Operation and Maintenance

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

Similarly, a permittee has a “duty to mitigate” pursuant to 40 C.F.R. § 122.41(d), which requires the permittee to “take all reasonable steps to minimize or prevent any discharge in violations of the permit which has a reasonable likelihood of adversely affecting human health or the environment.”

General requirements for proper operation and maintenance, and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.B., I.C., and I.D. of the draft permit. These requirements include mapping of the wastewater collection system, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff,

performing preventative maintenance, controlling inflow and infiltration to the extent necessary to prevent SSOs and I/I related effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary.

H. Antidegradation

This draft permit is being reissued with no change in outfall location, and with effluent limits and monitoring requirements identical to or more stringent than those in the existing permit. The State of New Hampshire has indicated that there is no lowering of water quality and no loss of existing water uses and that no additional antidegradation review is warranted at this time.

I. Additional Requirements and Conditions

The draft permit compliance monitoring frequencies and sample types for flow, CBOD₅, TSS, pH, TRC, metals, and bacteria are consistent with the latest version of EPA/NHDES-WD's Effluent Monitoring Guidance (EMG) mutually agreed upon and first implemented in March 1993 and last revised on July 19, 1999. In addition, the WET test monitoring requirements are consistent with EPA-New England's Municipal Toxicity Policy. It is the intent of EPA-New England and NHDES-WD to establish minimum monitoring frequencies in all NPDES permits that (1) are reasonable from environmental and human health perspective; and, (2) are in accordance with the EMG. The effluent monitoring requirements in the draft permit have been established to yield data representative of the discharge under the authority of Section 308(a) of the CWA in accordance with 40 C.F.R. §122.41(j), §122.44(h) and §122.48.

The remaining conditions of the permit are based on the NPDES regulations 40 C.F.R., Parts 122 through 125, and consist primarily of management requirements common to all permits.

J. Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1801 et seq. (1998)), EPA is required to consult with the National Fisheries Services (NOAA Fisheries) if EPA's action or proposed action that it funds, permits, or undertakes, may adversely impact any essential fish habitat (EFH). The Amendments broadly define "essential fish habitat" as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 U.S.C. §1802 (10)). "Adversely impact" means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. §600.910(a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

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

The Atlantic salmon (*Salmo salar*) is the only managed species with designated EFH in the Connecticut River, which is classified in the New Hampshire water quality standards as Class B. Class B waters are designated as a habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other crucial functions, and for primary and secondary contact recreation.

Atlantic salmon may be present during one or more lifestages within the area which encompasses the discharge site. Atlantic salmon may pass in the vicinity of the discharge either on the migration of juveniles downstream to Long Island Sound or on the return of adults to upstream areas. EPA has determined that the limits and conditions contained in this draft permit minimize adverse effects to Atlantic Salmon EFH for the following reasons:

- The effluent permit limits for outfall 001 of the Troy WWTF are as stringent as or more stringent than the 2003 permit. There was no change in the outfall locations. The permit meets all New Hampshire water quality standards and includes monitoring and reporting requirements to ensure compliance.
- Even under worst-case conditions of low river flow and maximum facility discharge, a dilution factor of 2.0 was calculated for the effluent as it enters the South Branch of the Ashuelot River.
- The facility has no intake structure on the South Branch of the Ashuelot River.
- Limits specifically protective of aquatic organisms have been established for chlorine, total phosphorus, ammonia nitrogen as N, and total recoverable aluminum, copper, and lead based on EPA water quality criteria.
- The draft permit requires that the permittee conduct acute and chronic WET testing at outfall 001 once per year. Each test must include the daphnid, *Ceriodaphnia dubia*, and fathead minnow, *Pimephales promelas*, in accordance with EPA Region I protocol.

EPA believes that the conditions and limitations contained within the draft permit adequately protects all aquatic life, including those with designated EFH in the receiving water, and that further mitigation is not warranted. Should adverse impacts to EFH be detected as a result of this permit action, or if new information is received that changes the basis for EPA's conclusions, NMFS will be contacted and an EFH consultation will be re-initiated.

As the federal agency charged with authorizing the discharge from this facility, EPA has submitted the draft permit and fact sheet, along with a cover letter, to NMFS Habitat Division for their review.

K. Endangered Species

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 United States Fish and Wildlife Service (USFWS) typically administer Section 7 consultations for bird, terrestrial, and freshwater aquatic species. The National Marine Fisheries Service (NMFS) typically administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish and wildlife to see if any listed species might potentially be impacted by the re-issuance of this NPDES permit. The review has focused primarily on dwarf wedgemussel (*Alasmidonta heterodon*) since the discharge is into

the South Branch of the Ashuelot River. Based on the low levels of concern, permit conditions, no intake structure and distribution of listed species in the vicinity of the facility's discharge, EPA has determined that there will be no effects on these species.

In an initial contact with USFWS in 2009 it was determined that because the treatment plant is far enough upstream of any known populations of dwarf wedgemussels, there is not a concern of adverse impacts to this species through this permit action. EPA is coordinating a review of this finding with USFWS through the draft permit and fact sheet and further consultation under Section 7 of the ESA with USFWS is not required.

If adverse effects do occur as a result of this permit action, or if new information becomes available that changes the basis for this determination, EPA will notify NMFS and initiate consultation.

VII. State Certification Requirements

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards or waives its right to certify as set forth in 40 CFR §124.53. State Water Quality Standards contain three major elements: Beneficial uses; Water Quality Criteria; and an Antidegradation Policy, all of which are part of the State's Water-Quality Certification under Section 401 of the Act. The only exception to this is that sludge conditions/requirements are not part of the Section 401 State Certification. The staff of the NHDES-WD has reviewed the draft permit and advised EPA-New England that the limitations are adequate to protect water quality. EPA-New England 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.

VIII. Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to: **Mr. Michael Cobb, U.S. Environmental Protection Agency, Region 1 (New England), 5 Post Office Square - Suite 100, Mail Code OEP06-1, Boston, MA 02109-3912**. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA-New England and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA-New England's Boston office.

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

IX. EPA-Region 1 Contact

Additional information concerning the draft permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M. (8:00 A.M. and 4:00 P.M. for the state), Monday through Friday, excluding holidays from:

**Mr. Michael Cobb, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
5 Post Office Square
Suite 100, Mail Code: OEP06-1
Boston, Massachusetts 02109-3912
Telephone No.: (617) 918-1369**

Date: July 16, 2013

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

ATTACHMENT A – LOCATION OF TROY WWTF AND OUTFALL 001



* Photo taken April 13, 1998. Obtained from <http://terraserver-usa.com>.

ATTACHMENT B – SUMMARY OF EFFLUENT CHARACTERISTICS

Monitoring Period End Date	CBOD5							TSS						
	MO AVG		WKLY AVG		DAILY MX		MO AV MN	MO AVG		WKLY AVG		DAILY MX		MO AV MN
	25 mg/L	55.3 lb/d	40 mg/L	88.5 lb/d	45 mg/L	99.5 lb/d	85 %	30 mg/L	66.3 lb/d	45 mg/L	99.5 lb/d	50 mg/L	110.6 lb/d	85 %
Limits >>>														
01/31/2008	4.	2.	4.	3.	4.	3.	98.9	2.6	1.	4.	2.	4.	2.	96.5
02/29/2008	4.	3.	4.	3.	4.	4.	98.8	4.	3.	4.	3.	5.	5.	98.8
03/31/2008	5.	5.	5.	5.	6.	10.	95.8	6.	5.	5.	5.	8.	7.	96.9
04/30/2008	4.	4.	3.5	4.	4.	5.	97.5	5.	6.	5.	6.	7.	9.6	96.6
05/31/2008	7.	4.5	8.	5.	7.	8.	98.2	4.3	3.8	5.	5.8	5.	5.8	98.4
06/30/2008	3.8	2.	4.	2.1	4.	2.6	98.	3.3	1.7	4.	2.1	4.	2.1	99.
07/31/2008	3.4	1.7	4.	1.7	4.	2.4	99.	2.6	1.4	3.	1.4	3.	3.2	99.
08/31/2008	4.	3.3	6.	4.7	6.	4.7	98.	2.3	1.9	4.	3.2	3.	2.4	99.
09/30/2008	4.6	2.1	4.6	3.	6.	3.	99.	1.5	0.7	2.	1.	2.	1.	100.
10/31/2008	3.	1.9	5.	2.6	5.	2.6	99.	1.6	0.7	3.	1.6	3.	1.6	99.
11/30/2008	0.	0.	3.	1.8	0.	0.	100.	3.	1.8	10.	6.	10.	6.	99.
12/31/2008	1.8	1.1	3.	1.8	3.	1.9	99.	6.	3.7	5.	3.	15.	9.6	98.
01/31/2009	4.5	3.3	6.	5.	6.	5.	98.	6.3	4.6	15.	9.6	7.	5.5	97.
02/28/2009	6.	3.	8.	4.1	8.	4.1	98.	4.8	2.4	6.	3.1	6.	3.1	99.
03/31/2009	4.3	2.6	5.	3.4	5.	3.4	98.	3.8	2.3	6.	4.1	6.	4.1	98.
04/30/2009	4.4	3.7	6.	5.3	6.	5.3	97.	4.	3.4	5.	4.2	5.	4.2	91.
05/31/2009	5.8	3.9	8.	4.9	8.	4.9	98.	3.5	2.1	4.	3.3	4.	2.4	98.
06/30/2009	4.3	2.3	5.	2.7	5.	2.7	98.	2.5	1.4	3.	1.7	3.	1.7	99.
07/31/2009	4.2	3.	5.	3.3	5.	3.3	98.	2.6	1.8	5.	2.9	5.	2.9	99.
08/31/2009	3.5	2.1	4.	4.	4.	3.3	99.	3.	1.6	3.	2.5	3.	2.5	99.
09/30/2009	3.6	1.7	4.	2.	4.	2.	99.	2.2	1.2	3.	1.8	3.	1.8	99.
10/31/2009	3.5	2.	5.	2.9	5.	2.9	99.	2.3	1.3	4.	2.1	4.	2.1	99.
11/30/2009	3.4	2.1	5.	3.2	5.	3.2	99.	0.2	0.1	0.5	0.3	0.5	0.6	100.
12/31/2009	4.2	2.4	6.	3.5	6.	3.5	98.	1.	0.6	2.	1.2	2.	1.2	100.
01/31/2010	4.8	3.	5.	3.8	5.	3.8	99.	3.	1.9	4.	2.4	4.	2.4	99.
02/28/2010	4.	2.7	5.	3.6	5.	3.6	98.	4.	2.6	5.	3.	5.	3.	99.
03/31/2010	3.6	3.8	4.	4.8	5.	7.6	98.	3.2	3.6	4.	4.8	4.	7.6	98.
04/30/2010	5.	4.3	6.	7.6	6.	6.1	98.	6.5	7.4	14.	21.2	14.	21.2	96.
05/31/2010	5.	3.	6.	4.2	5.	3.3	98.	3.5	2.4	4.	2.8	4.	2.8	99.

06/30/2010	4.	2.7	5.	3.2	6.	3.5	99.	1.4	0.9	3.	1.8	3.	1.8	99.
07/31/2010	3.	1.5	6.	3.5	5.	2.8	99.	2.3	1.3	3.	1.7	3.	1.7	99.
08/31/2010	3.8	2.2	5.	2.9	5.	2.9	99.	1.5	0.9	3.	1.8	3.	1.8	99.
09/30/2010	3.3	1.7	4.	2.3	4.	2.3	99.	1.8	0.9	2.	1.1	2.	1.1	99.
10/31/2010	3.5	1.8	5.	2.7	5.	2.7	99.	1.	0.5	2.	1.	2.	1.	100.
11/30/2010	3.	1.7	3.	1.9	3.	1.9	99.	2.	1.2	3.	1.9	3.	1.9	99.
12/31/2010	3.	2.	4.	3.2	4.	3.2	99.	4.	2.6	5.	4.	5.	4.	99.
01/31/2011	2.5	1.4	4.	2.3	4.	2.3	99.	5.5	3.	7.	4.	7.	4.	99.
02/28/2011	4.3	1.6	7.	3.	7.	2.9	99.	5.	1.9	6.	2.	6.	2.5	99.
03/31/2011	5.8	5.8	11.	14.3	11.	14.3	97.	5.	4.7	6.	6.5	6.	6.5	98.
04/30/2011	3.	2.3	4.	3.	3.	2.6	99.	5.	3.8	5.	4.	5.	4.3	99.
05/31/2011	2.	1.9	4.	3.4	4.	3.4	99.	5.	3.9	6.	5.	6.	5.2	99.
06/30/2011	2.2	1.3	3.	1.8	3.	1.8	99.	1.6	1.	3.	2.4	3.	2.4	99.
07/31/2011	3.	1.5	3.	1.6	3.	1.6	99.	2.	1.	3.	1.5	3.	1.5	99.
08/31/2011	2.8	1.4	4.	2.	4.	2.	99.	2.2	1.1	4.	2.	4.	2.	99.
09/30/2011	2.	1.1	3.	1.5	3.	1.5	99.	1.5	0.8	2.	0.9	2.	1.2	100.
10/31/2011	2.2	1.7	4.	3.6	4.	3.6	99.	0.8	0.6	2.	1.3	2.	1.3	100.
11/30/2011	1.6	1.	3.	1.7	3.	1.9	99.	0.8	0.5	1.	0.6	2.	1.2	100.
12/31/2011	3.5	2.9	4.	3.9	4.	3.9	98.	2.3	1.9	3.	2.8	3.	2.8	99.
01/31/2012	3.5	2.	4.	22.	4.	2.2	99.	2.3	1.3	3.	1.6	3.	1.6	99.
02/29/2012	3.4	1.7	4.	2.3	4.	2.3	99.	2.	1.1	2.	1.	2.	1.2	100.
03/31/2012	3.3	1.7	4.	2.5	4.	2.5	99.	2.	0.9	2.	1.2	2.	1.2	100.
Average	3.67	2.4	4.81	3.82	4.76	3.59	98.6	3.05	2.1	4.26	3.16	4.42	3.46	98.67
Minimum	0.	0.	3.	1.5	0.	0.	95.8	0.2	0.1	0.5	0.3	0.5	0.6	91.
Maximum	7.	5.8	11.	22.	11.	14.3	100.	6.5	7.4	15.	21.2	15.	21.2	100.

Monitoring Period End Date	TRC		E. coli		Flow		Ammonia-N			pH		Phosphorus	
	MO AVG	DAILY MX	MO GEO	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX		MINIMUM	MAXIMUM	MO AVG	DAILY MX
Limits >>>	50 ug/L	50 ug/L	126 #/100mL	406 #/100mL	MGD	MGD	* lb/d	* mg/L	mg/L	6.5 SU	8 SU	mg/L	mg/L
01/31/2008	0.	0.02	35.	960.	0.069	0.087	2.86	4.96	5.7	6.5	7.1	---	---
02/29/2008	0.	0.02	2.	24.	0.098	0.23	4.8	5.6	6.2	6.5	7.3	---	---
03/31/2008	0.	0.1	4.	55.	0.115	0.209	9.9	10.7	14.	6.5	6.9	---	---
04/30/2008	0.	0.2	0.	57.	0.131	0.165	7.6	6.6	7.6	6.5	6.8	---	---
05/31/2008	0.	0.2	5.	23.	0.119	0.155	7.4	8.4	8.7	6.5	7.9	5.5	7.9
06/30/2008	0.	0.	6.	123.	0.061	0.078	3.2	6.	6.6	6.53	7.	4.88	5.5
07/31/2008	0.	0.	4.2	112.	0.064	0.11	1.9	4.1	4.9	6.5	7.9	6.24	6.6
08/31/2008	0.	0.	19.6	91.	0.089	0.11	0.2	0.3	0.6	6.6	7.7	5.25	5.6
09/30/2008	0.	0.	16.	56.	0.067	0.078	0.3	0.6	3.4	6.5	7.4	5.3	5.7
10/31/2008	0.	0.	1.	7.	0.07	0.08	0.2	0.4	1.	6.5	7.9	---	---
11/30/2008	0.	0.	1.	1.	0.07	0.083	1.1	1.9	2.9	6.5	6.8	---	---
12/31/2008	0.	0.	1.5	16.	0.072	0.08	0.2	0.4	0.7	6.5	6.9	---	---
01/31/2009	0.	0.	7.3	157.	0.09	0.108	2.7	3.7	4.8	6.5	7.8	---	---
02/28/2009	0.	0.	3.	26.	0.062	0.07	2.6	5.2	5.7	6.8	7.5	---	---
03/31/2009	0.	0.	1.7	7.	0.072	0.089	5.6	9.2	9.9	6.5	7.3	---	---
04/30/2009	0.	0.	2.4	12.	0.1	0.11	---	---	---	6.7	7.14	---	---
05/31/2009	0.	0.	6.5	110.	0.072	0.106	6.6	11.	13.	6.5	7.3	5.	5.2
06/30/2009	0.	0.	5.7	109.	0.067	0.075	2.9	5.3	6.6	6.5	6.8	5.4	5.9
07/31/2009	0.	0.	3.3	59.	0.085	0.111	4.7	6.3	8.7	6.5	7.	5.8	6.3
08/31/2009	0.	0.	2.6	109.	0.079	0.104	5.5	9.2	13.	6.6	7.2	5.8	6.5
09/30/2009	0.	0.	2.9	10.	0.069	0.089	3.4	6.2	7.	6.9	7.5	6.	6.8
10/31/2009	0.	0.	1.7	5.	0.067	0.078	1.3	2.2	3.9	6.6	7.4	---	---
11/30/2009	0.	0.	1.3	4.	0.073	0.079	3.2	5.3	7.3	6.5	7.6	---	---
12/31/2009	0.	0.	2.3	48.	0.072	0.088	4.7	8.1	9.1	6.5	6.9	---	---
01/31/2010	0.	230.	4.2	22.	0.073	0.092	6.	9.5	9.8	6.7	7.2	---	---
02/28/2010	0.	0.	17.8	208.	0.08	0.091	7.6	11.5	12.	6.5	7.2	---	---
03/31/2010	0.	0.	36.3	435.	0.107	0.182	12.2	12.4	13.	6.7	7.7	---	---
04/30/2010	0.	0.	2.5	7.	0.12	0.195	---	---	---	6.5	7.1	---	---

05/31/2010	0.	0.	1.9	59.	0.079	0.097	5.1	7.5	9.4	6.5	6.8	4.9	6.5
06/30/2010	0.	0.	1.6	10.	0.073	0.083	4.1	6.7	7.	6.5	6.9	5.	5.4
07/31/2010	0.	0.	7.7	29.	0.068	0.076	3.6	6.3	7.	6.5	6.9	5.8	6.4
08/31/2010	0.	0.	6.9	24.	0.068	0.077	2.9	5.	6.	6.5	7.1	6.1	6.4
09/30/2010	0.	0.	12.	88.	0.061	0.083	0.9	1.8	4.5	6.5	7.9	6.5	6.7
10/31/2010	0.	0.	1.	1.	0.063	0.071	0.2	0.4	0.6	6.5	7.1	---	---
11/30/2010	0.	0.	4.	31.	0.071	0.086	0.4	0.7	1.	6.5	6.8	---	---
12/31/2010	0.	0.	3.	21.	0.092	0.105	0.7	1.	2.4	6.5	7.3	---	---
01/31/2011	0.	0.	10.9	89.	0.062	0.105	0.2	0.5	0.8	6.5	7.9	---	---
02/28/2011	0.	0.	3.9	201.	0.047	0.61	1.3	3.2	5.5	6.5	7.4	---	---
03/31/2011	0.	0.	35.9	525.	0.123	0.241	12.8	11.9	17.	6.9	7.6	---	---
04/30/2011	0.	0.	32.	91.	0.095	0.112	---	---	---	6.8	7.3	---	---
05/31/2011	0.	0.	1.	1.	0.099	0.109	15.4	18.	20.	6.5	7.6	4.	4.
06/30/2011	0.	0.	1.	1.	0.07	0.1	8.1	11.	15.	6.5	6.8	4.3	4.7
07/31/2011	0.	0.	2.1	165.	0.062	0.069	1.9	3.7	7.3	6.5	7.5	5.2	6.5
08/31/2011	0.	0.	5.1	165.	0.06	0.069	0.4	0.9	2.2	7.	7.8	5.	5.3
09/30/2011	0.	0.	4.8	19.	0.065	0.085	0.3	0.7	1.1	6.7	7.9	3.5	4.7
10/31/2011	0.	0.	4.4	200.	0.093	0.147	0.9	1.2	2.1	6.6	7.2	---	---
11/30/2011	0.	0.	1.	0.	0.074	0.101	0.1	0.2	0.6	6.5	7.8	---	---
12/31/2011	0.	0.	1.	1.	0.102	0.129	0.3	0.4	1.	6.5	7.4	---	---
01/31/2012	0.	0.	2.7	64.	0.066	0.099	1.1	2.1	3.5	6.5	7.2	---	---
02/29/2012	0.	0.	1.	1.	0.062	0.079	2.8	5.5	9.9	6.6	10.6	---	---
03/31/2012	0.	0.	1.2	3.	0.067	0.083	7.2	13.6	21.	6.9	7.3	---	---
Average	0.	4.52	6.72	91.02	0.08	0.12	3.74	5.36	6.9	6.57	7.38	5.27	5.93
Minimum	0.	0.	0.	0.	0.047	0.069	0.1	0.2	0.6	6.5	6.8	3.5	4.
Maximum	0.	230.	36.3	960.	0.131	0.61	15.4	18.	21.	7.	10.6	6.5	7.9

* Monthly average ammonia nitrogen as N limits vary seasonally. The limits during October 1st through April 30th are 13.2 mg/l and 29.2 lb/d. The limits during May 1st through September 30th are 8.7 mg/l and 19.2 lb/d.

Monitoring Period End Date	Al	Cd	Cr	Cu	Pb	Ni	Zn	Hardness	Ammonia-N	LC50 - Daphnid	LC50 - Pimephales	C-NOEC - Daphnid	C-NOEC - Pimephales
	MO AVG	MO AVG	DAILY MN	DAILY MN	DAILY MN	DAILY MN							
	mg/L	mg/L	100 %	100 %	50 %	50 %							
09/30/2008	0.04	0.	---	0.012	0.	0.004	0.018	48.	0.1	100.	100.	50.	100.
09/30/2009	0.05	0.	0.	0.016	0.	0.004	0.019	40.	5.7	100.	100.	100.	100.
09/30/2010	0.05	0.	0.	0.014	0.	0.003	0.023	51.	0.	100.	100.	100.	100.
09/30/2011	0.031	0.	0.	0.007	0.	0.003	0.01	55.	0.	100.	100.	100.	100.
Average	0.043	0.	0.	0.012	0.	0.004	0.018	48.5	1.45	100.	100.	87.5	100.
Minimum	0.031	0.	0.	0.007	0.	0.003	0.01	40.	0.	100.	100.	50.	100.
Maximum	0.05	0.	0.	0.016	0.	0.004	0.023	55.	5.7	100.	100.	100.	100.

Upstream Data from WET tests

Monitoring Period End Date	Al	Cd	Cr	Cu	Pb	Ni	Zn
	MO AVG						
	mg/L						
09/30/2008	0.23	0.	---	0.	0.001	0.	0.011
09/30/2009	0.23	0.	---	0.016	0.	0.004	0.019
09/30/2010	0.13	0.	---	0.014	0.	0.003	0.023
09/30/2011	0.15	0.	---	0.003	0.0006	0.	0.004
Median	0.19	0.	---	0.0085	0.0003	0.0015	0.015

ATTACHMENT C – MASS-BASED LIMITS, 7Q10, DILUTION AND TRC CALCULATIONS

Mass-based Limits Calculations:

Equation used to calculate maximum allowable loads for CBOD₅, TSS and Ammonia Nitrogen:

$$L = C \times Q_{PDF} \times 8.345$$

where:

- L = Maximum allowable load, in lb/day, rounded to nearest 1 lb/day
- C = Maximum allowable effluent concentration for reporting period, in mg/L
- Q_{PDF} = Treatment plant's design flow, in mgd
- 8.345 = Factor to convert effluent concentration (mg/L) times design flow (mgd) to lb/day

7Q10 Calculation:

Actual 7Q10 at USGS Gage No. 01160000 at Webb, NH = 1.932 cfs

Calculated 7Q10 at USGS Gage No. 01160000 using Dingman = 1.778 cfs

Calculated 7Q10 at the Troy WWTP outfall using Dingman = 0.841 cfs

$$\begin{aligned} 7Q10_{Troy\ WWTP} &= \frac{\text{Calculated } 7Q10_{Troy\ WWTP}}{\text{Calculated } 7Q10_{Webb\ Gage}} \times \text{Actual } 7Q10_{Webb\ Gage} \\ &= \frac{0.841\text{ cfs}}{1.778\text{ cfs}} \times 1.932\text{ cfs} = 0.91\text{ cfs} \end{aligned}$$

Dilution Calculation:

$$\text{Dilution Factor} = \frac{Q_{7Q10}}{Q_{Troy} \times 1.547} \times 0.9$$

where:

Q_{7Q10} = 7Q10 flow of the South Branch of the Ashuelot River at the Troy WWTP outfall = 0.91 cfs

Q_{Troy} = Design flow of the Troy WWTP = 0.265 mgd

1.547 = Conversion factor to convert mgd to cfs.

0.9 = Factor to reserve 10% of the river's assimilative capacity.

$$\text{Dilution Factor} = \frac{0.91\text{ cfs}}{0.265\text{ mgd} \times 1.547} \times 0.9 = 2.0$$

Total Residual Chlorine Calculation:

Equation used to calculate average monthly and maximum daily Total Residual Chlorine limits.

$$\text{Chlorine Limit} = \text{Dilution Factor} \times \text{Water Quality Standard}$$

where water quality standards for chlorine are:

0.011 = Chronic Aquatic-Life Criterion, in mg/L

0.019 = Acute Aquatic-Life Criterion, in mg/L

ATTACHMENT D – NITROGEN LOADS

NH, VT, MA Discharges to Connecticut River Watershed

NAME	NUMBER	DESIGN FLOW (MGD) ¹	AVERAGE FLOW (MGD) ²	TOTAL NITROGEN (mg/l) ³	TOTAL NITROGEN (lbs/day) ⁴	Exp. Date
Bethlehem	NH0100501		0.19	19.6	31.1	
Charlestown	NH0100765		0.38	19.6	62.1	
Claremont	NH0101257		1.60	14.0 ⁶	186.8	2005
Colebrook	NH0100315		0.22	19.6	36.0	
Groveton	NH0100226		0.49	19.6	80.1	
Woodsville	NH0100978		0.19	16.0 ⁶	25.4	
Hinsdale	NH0100382		0.27	19.6	44.1	
Lancaster	NH0100145		0.98	8.8 ⁶	71.9	2005
Lisbon	NH0100421		0.17	19.6	27.8	
Littleton	NH0100153		0.77	10.0 ⁶	64.2	
Newport	NH0100200		0.65	19.6	106.2	2006
Keene	NH0100790	6.0	3.47	12.7	367.5	1999
Northumberland	NH0101206		0.06	19.6	9.8	
Sunapee	NH0100544		0.35	15.5	44.7	
Troy	NH0101052		0.10	19.6	16.3	
Lebanon	NH0100366		1.87	19.0 ⁶	296.3	2011
Swanzy	NH0101150		0.09	19.6	14.7	
Whitefield	NH0100510		0.12	19.6	19.6	
Winchester	NH0100404		0.23	19.6	37.6	
Hanover	NH0100099		1.5	19.6	245.2	
			13.70		1,787.4	
Bellows Falls	VT010013	1.40 ⁵	0.61	21.0 ⁶	106.8	
Bethel	VT0100048	0.12 ⁵	0.12	19.6	19.6	
Bradford	VT0100803	0.14 ⁵	0.14	19.6	22.9	
Brattleboro	VT010064	3.00 ⁵	1.64	20.0 ⁶	273.6	2009
Bridgewater	VT0100846	0.04 ⁵	0.04	19.6	6.5	
Canaan	VT0100625	0.18 ⁵	0.18	19.6	29.4	
Cavendish	VT0100862	0.15 ⁵	0.15	19.6	24.5	
Chelsea	VT0100943	0.06 ⁵	0.06	19.6	9.8	
Chester	VT010081	0.18 ⁵	0.18	19.6	29.4	
Danville	VT0100633	0.06 ⁵	0.06	19.6	9.8	
Lunenburg	VT0101061	0.08 ⁵	0.08	19.6	13.1	

Hartford	VT0100978	0.30 ⁵	0.3	19.6	49.0	
Ludlow	VT0100145	0.70 ⁵	0.36	15.5	46.5	
Lyndon	VT0100595	0.75 ⁵	0.75	19.6	122.6	2007
Putney	VT0100277	0.08 ⁵	0.08	19.6	13.1	
Randolph	VT0100285	0.40 ⁵	0.4	19.6	65.4	
Readsboro	VT0100731	0.75 ⁵	0.75	19.6	122.6	2007
Royalton	VT0100854	0.07 ⁵	0.07	19.6	11.4	
ST. Johnsbury	VT0100579	1.60	1.14	12.0 ⁶	114.1	2009
Saxtons River	VT0100609	0.10 ⁵	0.1	19.6	16.3	
Sherburne Fire Dist.	VT0101141	0.30 ⁵	0.3	19.6	49.0	
Woodstock WWTP	VT0100749	0.05 ⁵	0.05	19.6	8.2	
Springfield	VT0100374	2.20	1.25	12.0 ⁶	125.1	2003
Hartford	VT0101010	1.22 ⁵	0.97	30.0 ⁶	242.7	2006
Whitingham	VT0101109	0.01 ⁵	0.01	19.6	1.6	
Whitingham Jacksonville	VT0101044	0.05 ⁵	0.05	19.6	8.2	
Cold Brook Fire Dist.	VT0101214	0.05 ⁵	0.05	19.6	8.2	
Wilmington	VT0100706	0.14 ⁵	0.14	19.6	22.9	
Windsor	VT0100919	1.13 ⁵	0.45	19.6	73.6	
Windsor-Weston	VT0100447	0.02 ⁵	0.02	19.6	3.3	
Woodstock WTP	VT0100757	0.45 ⁵	0.45	19.6	73.6	
Woodstock-Taftsville	VT0100765	0.01 ⁵	0.01	19.6	1.6	
			10.96		1724.4	
Huntington	MA0101265	0.20 ⁵	0.12	19.6	19.6	
Russell	MA0100960	0.24	0.16	19.6	26.2	
Westfield	MA0101800	6.10 ⁵	3.78	20.4	643.1	2005
Woronoco Village	MA0103233	0.02	0.01	19.6	1.6	
Charlemont	MA0103101	0.05 ⁵	0.03	19.6	4.9	
Greenfield	MA0101214	3.20	3.77	13.6	427.6	2007
Monroe	MA0100188	0.02	0.01	19.6	1.6	
Old Deerfield	MA0101940	0.25 ⁵	0.18	9.2	13.8	
Shelburne Falls	MA0101044	0.25 ⁵	0.22	16.9	31.0	
Amherst	MA0100218	7.10	4.28	14.1	503.3	2005
Barre	MA0103152	0.30 ⁵	0.29	26.4	63.8	

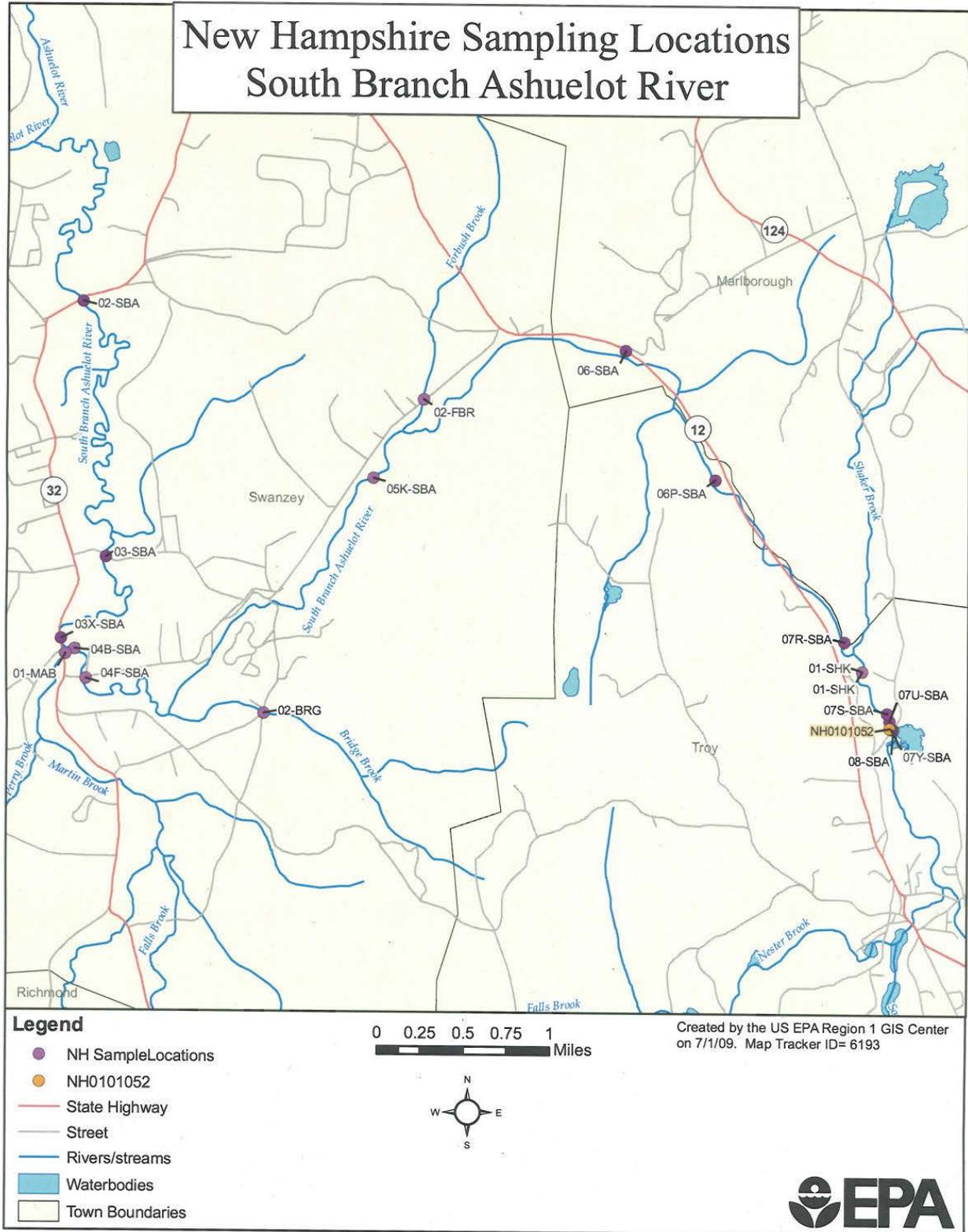
Belchertown	MA0102148	1.00	0.41	12.7	43.4	
Easthampton	MA0101478	3.80	3.02	19.6	493.7	2000
Hadley	MA0100099	0.54	0.32	25.9	69.1	
Hatfield	MA0101290	0.50 ⁵	0.22	15.6	28.6	
Holyoke	MA0101630	17.50 ⁵	9.70	8.6	695.7	2005
Montague	MA0100137	1.83 ⁵	1.60	12.9	172.1	2006
Northampton	MA0101818	8.60 ⁵	4.40	22.1	811.0	2005
Northfield School	MA0032573	0.45	0.10	19.6	16.3	
Northfield	MA0100200	0.28	0.24	16.8	33.6	
South Deerfield	MA0101648	0.85	0.70	7.9	46.1	
South Hadley	MA0100455	4.20 ⁵	3.30	28.8	792.6	2005
Sunderland	MA0101079	0.50 ⁵	0.19	8.7	13.8	
Athol	MA0100005	1.75 ⁵	1.39	17.2	199.4	2007
Erving #2	MA0101052	2.70 ⁵	1.80	3.2	48.0	2007
Erving #1	MA0101516	1.02 ⁵	0.32	29.3	78.2	
Erving #3	MA0102776	0.01	0.01	19.6	1.6	
Gardner	MA0100994	5.00 ⁵	3.70	14.6	450.5	2007
Orange	MA0101257	1.10 ⁵	1.20	8.6	86.1	
Royalston	MA0100161	0.04 ⁵	0.07	19.6	11.4	
Templeton	MA0100340	2.80 ⁵	0.40	26.4	88.1	
Winchendon	MA0100862	1.10 ⁵	0.61	15.5	78.9	
Chicopee	MA0101508	15.50 ⁵	10.0	19.4	1,618.0	2010
Hardwick W	MA0102431	0.04 ⁵	0.01	12.3	1.0	
Hardwick G	MA0100102	0.23 ⁵	0.14	14.6	17.0	
N Brookfield	MA0101061	0.76 ⁵	0.62	23.1	119.4	2005
Palmer	MA0101168	5.60 ⁵	2.40	18.8	376.3	2005
Spencer	MA0100919	1.08 ⁵	0.56	13.6	63.5	
Ware	MA0100889	1.00 ⁵	0.74	9.4	58.0	
Warren	MA0101567	1.50	0.53	14.1	62.3	
Springfield			45.4	4.3	1,628.1	2006
			104.05		9,938.3	

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l),

average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.

4. Current total nitrogen load.
5. Flow limit is based on an annual average rather than a monthly average.
6. Effluent total nitrogen data from USGS study.

ATTACHMENT E – SOUTH BRANCH OF ASHUELOT TMDL SAMPLING LOCATIONS



ATTACHMENT F – STATISTICAL ANALYSIS FOR 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.

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:

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

TSD at 52. 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.

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

$$\sigma^2 = \text{variance of the log-transformed data} = \ln(CV^2 + 1)$$

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.

RESPONSE TO COMMENTS – SEPTEMBER 16, 2013
REISSUANCE OF NPDES PERMIT NO. NH0101052
TOWN OF TROY
TROY WASTEWATER TREATMENT FACILITY
TROY, NEW HAMPSHIRE

From August 15, 2013 through September 13, 2013 the U.S. Environmental Protection Agency (EPA-Region 1) and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the Town of Troy, NH.

EPA-New England and NHDES-WD received one comment from the Town of Troy, dated September 5, 2013. Below is the comment received and EPA's response to that comment.

A copy of the final permit may be obtained by writing or calling Michael Cobb, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1369. Copies may also be obtained from the EPA Region 1 web site at <http://www.epa.gov/region1/npdes/index.html>.

I. COMMENT FROM THE TOWN OF TROY

Comment I.A

This letter is to address the draft copy of the NPDES permit no. NH0101052 specifically the Total Recoverable Copper Limit of 3.1 Ug/l.

Why is our limit lower than surrounding facilities with more advanced treatment processes?

EPA Response I.A

The limits in this permit cannot be compared to limits for surrounding facilities since they are based on the site-specific impact of this discharge on the receiving water. As shown in pages 8 through 12 of the Fact Sheet, EPA conducted an analysis on various metals, including copper, to determine if any metal had the reasonable potential to cause or contribute to an exceedence of applicable water quality criteria. This analysis was done using site-specific data, including effluent data, ambient data just upstream of the discharge, and the 7Q10 low flow of the receiving water. The analysis of this site-specific data indicated that there was reasonable potential to exceed both the chronic and acute copper criteria. Hence, both daily maximum (4.1 ug/l) and monthly average (3.1 ug/l) permit limits for total recoverable copper are necessary to protect the designated uses of the receiving water. Since this analysis and the corresponding effluent limits are water quality-based and not technology-based, they not dependent on the treatment process applied at the facility. If the permittee believes that the facility is unable to consistently comply with these limits, they should contact Denny Dart of EPA-Region 1's Office of Environmental Stewardship at (617) 918-1850 to discuss a reasonable schedule of compliance.