AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

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

Wheaton College
East Main Street
Norton, MA 02766

is authorized to discharge from the facility located at

Wheaton College Wastewater Treatment Facility
East Main Street
Norton, Massachusetts 02766

to receiving water named

Rumford River (Taunton River Watershed – MA62-40)

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

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

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

This permit supersedes the permit issued on August 19, 2004.

This permit consists of **Part I** (14 pages including effluent limitations and monitoring requirements); **Attachment A** (USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013)**, Attachment B** (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011) and **Part II (**25 pages including NPDES Part II Standard Conditions).

Signed this WK day of ' HFHP EHU

_/S/SIGNATURE ON FILE_____
Ken Moraff, Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

/S/SIGNATURE ON FILE_____
David Ferris, Director
Massachusetts Wastewater Management Program
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

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

EFFLUENT CHARACTERISTIC	**EFFLUENT LIMITS**					**MONITORING REQUIREMENTS[1]**	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
FLOW	********	********	0.12 MGD	********	0.16 MGD	CONTINUOUS	RECORDER
BOD_5 [2]	30 lbs/Day	45 lbs/Day	30 mg/l	45 mg/l	Report mg/l	1/WEEK	24-HOUR COMPOSITE[3]
TSS [2]	30 lbs/Day	45 lbs/Day	30 mg/l	45 mg/l	Report mg/l	1/WEEK	24-HOUR COMPOSITE[3]
pH RANGE[4]	6.5 - 8.3 SU (SEE PERMIT PARAGRAPH I.A.1.b.)					1/DAY	GRAB
ESCHERICHIA COLI [4,5] (April 1 – October 31)	********	**********	126 cfu/100 ml	********	409 cfu/100 ml	1/WEEK	GRAB
TOTAL RESIDUAL CHLORINE[6]	********	**********	0.19 mg/l	********	0.32 mg/l	2/DAY	GRAB
TOTAL PHOSPHORUS	********	********	1.0 mg/l	********	Report mg/l	1/WEEK	24-HOUR COMPOSITE[3]
TOTAL NITROGEN[7] (May 1 - October 31)	Report lbs/day	******	Report mg/l	******	******	1/WEEK	24-HOUR COMPOSITE[3]
TOTAL KJELDAHL NITROGEN	Report lbs/day		Report mg/l				
TOTAL NITRATE	Report lbs/day		Report mg/l				
TOTAL NITRITE	Report lbs/day		Report mg/l				

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

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS					MONITORING REQUIREMENTS[1]	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
TOTAL RECOVERABLE ALUMINUM[14]	*********	*********	305 ug/l	*********	*********	1/MONTH	24-HOUR COMPOSITE[3]
TOTAL RECOVERABLE COPPER[14]	*********	*********	7.3 ug/l	*********	33.9 ug/l	1/MONTH	24-HOUR COMPOSITE[3]
TOTAL RECOVERABLE LEAD[8,14]	*********	*********	3.6 ug/l	*********	*********	1/MONTH	24-HOUR COMPOSITE[3]
WHOLE EFFLUENT TOXICITY [9, 10, 11, 12]	Acute $LC_{50} \geq 100\%$ Chronic C-NOEC Report					2/YEAR	24-HOUR COMPOSITE[3]
Hardness[13]	Report mg/l					2/YEAR	24-HR COMP[3]
Ammonia Nitrogen as N[13]	Report mg/l					2/YEAR	24-HR COMP[3]
Total Recoverable Aluminum[13]	Report mg/l					2/YEAR	24-HR COMP[3]
Total Recoverable Cadmium[13]	Report mg/l					2/YEAR	24-HR COMP[3]
Total Recoverable Copper[13]	Report mg/l					2/YEAR	24-HR COMP[3]
Total Recoverable Nickel[13]	Report mg/l					2/YEAR	24-HR COMP[3]
Total Recoverable Lead[8, 13]	Report mg/l					2/YEAR	24-HR COMP[3]
Total Recoverable Zinc[13]	Report mg/l					2/YEAR	24-HR COMP[3]

Sampling Location: Manhole after chlorine contact chamber.

Footnotes:

1. Effluent sampling shall be of the discharge and shall be collected at the point specified on page 3. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

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

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

2. Sampling required for influent and effluent.

3. 24-hour composite samples will consist of at least twenty four (24) grab samples taken during one consecutive 24 hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow.

4. Required for State Certification.

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

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

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

7. Within **one year of the effective date of the permit,** the permittee shall complete an evaluation of alternative methods of operating the existing wastewater treatment facility to optimize the removal of nitrogen, and submit a report to EPA and the MassDEP documenting this evaluation and presenting a description of recommended operational changes. The methods to be evaluated include, but are not limited to, operational changes designed to enhance nitrification (seasonal and year-round), incorporation of anoxic zones, and side stream management. The permittee shall implement the recommended

operational changes within two years of the effective date of the permit and shall submit a letter report summarizing its operational changes and nitrogen discharges to EPA and MassDEP no later than February 1 of each year. Such evaluation and implementation shall be waived if and when the permittee provides documentation to EPA that is has entered into a binding agreement to send its flow to the proposed Mansfield-Norton-Foxborough Regional Sewer District.

8. The minimum level (ML) for lead is defined as 0.5 ug/l. This value is the minimum level using the Furnace Atomic Absorption analytical method (EPA Method 220.2). This method or other EPA-approved method with an equivalent or lower ML shall be used. Sampling results equal to or less than the ML shall be reported as zero on the Discharge Monitoring Report.

9. The permittee shall conduct chronic and acute toxicity tests *two* times per year. The permittee shall test the daphnid, *Ceriodaphnia dubia*, and the fathead minnow, *Pimephales promelas*. Toxicity test samples shall be collected during the months of May and August. The chronic test must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit. The acute test must be performed in accordance with test procedures and protocols specified in **Attachment B** of this permit.

Test Dates	Submit Results by:	Test Species	Acute Limit LC_{50}	Chronic Limit C-NOEC
May August	June 30 September 30	Daphnid (*Ceriodaphnia Dubia*) Fathead Minnow (*Pimephales promelas*)	≥ 100%	Report Endpoint

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

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

11. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction, based on a statistically significant difference from dilution control, at a specific time of observation as determined from hypothesis testing. As described in the EPA WET Method Manual EPA 821-R-02-013, Section 10.2.6.2, all test results are to be reviewed

and reported in accordance with EPA guidance on the evaluation of the concentration-response relationship.

12. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test Procedure and Protocol) Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance, which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of *NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs)*, which may be found on the EPA Region I web site at http://www.epa.gov/Region1/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittees. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

13. For each whole effluent toxicity test the permittee shall report on the appropriate discharge monitoring report, (DMR), the concentrations of the hardness, ammonia nitrogen as nitrogen, total recoverable aluminum, cadmium, copper, lead, nickel, and zinc found in the 100 percent effluent sample. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachment A**. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report. This sampling may be used in partial satisfaction of the routine monitoring requirements for aluminum, copper and lead.

14. The permittee shall comply with the permit limits for Total Recoverable Aluminum, Total Recoverable Copper, and Total Recoverable Lead in accordance with the compliance schedule set forth in Part I.E.

Part I.A.1. (Continued)

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

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

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

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

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

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

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

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

2. The permittee must provide adequate notice to the Director of the following:

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

b. 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.

3. Prohibitions Concerning Interference and Pass Through:

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

4. Toxics Control

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

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

5. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed

pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

B. UNAUTHORIZED DISCHARGES

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

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

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions:

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.

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.

3. Infiltration/Inflow Control Plan:

   The permittee shall continue to implement a plan to control infiltration and inflow (I/I) to the separate sewer system. The plan shall be updated and submitted to EPA and MassDEP **within six months of the effective date of this permit** (see page 1 of this permit for the effective date) and shall describe the permittee's program for preventing infiltration/inflow related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and by-passes due to excessive infiltration/inflow.

   The plan shall include:

- An ongoing program to identify and remove sources of infiltration and inflow. The program shall include the necessary funding level and the source(s) of funding.

- An evaluation of the impact of completed and planned sewer separation projects on reduction of infiltration and inflow.

- An inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts. Priority should be given to removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.

- Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of infiltration and inflow to the system.

- An educational public outreach program for all aspects of I/I control, particularly private inflow.

Reporting Requirements:

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and MassDEP annually, **by March 31**. The summary report shall, at a minimum, include:

- A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year.

- Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year

- A map with areas identified for I/I-related investigation/action in the coming year.

- A calculation of the annual average I/I and the maximum month I/I for the reporting year.

- A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Unauthorized Discharges section of this permit.

4. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment works (as defined at 40 CFR § 122.2).

D. SLUDGE CONDITIONS

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

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

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

   a. Land application - the use of sewage sludge to condition or fertilize the soil

   b. Surface disposal - the placement of sewage sludge in a sludge only landfill

   c. Sewage sludge incineration in a sludge only incinerator

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

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

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

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

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

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

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

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

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

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

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

E. COMPLIANCE SCHEDULE

In order to comply with the new permit limits for Total Recoverable Aluminum, Total Recoverable Copper, and Total Recoverable Lead, the permittee shall take the following actions:

1. Within one year of the effective date of the permit, the Permittee shall perform a source assessment and evaluate alternatives for achieving the permit limits, and submit to EPA

and MassDEP a status report relative to the source control measures, treatment modification and/or planning and design of the facilities necessary to achieve the permit limits.

2. The permit limits shall go into effect two years from the effective date of the permit.

3. The permittee shall notify EPA and MassDEP of its compliance or noncompliance with the requirements of this part in writing no later than 14 days after each interim or final date of compliance.

F. 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 MassDEP Monthly Operations and Maintenance Report, 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 and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs (including Monthly Operation and Maintenance Reports) to MassDEP until further notice from MassDEP.

   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 be approved by EPA. All opt-out requests should be sent to the following addresses:

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

And

Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
1 Winter Street, 5th Floor
Boston, Massachusetts 02108

c. Submittal of Reports in Hard Copy Form

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

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

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

MassDEP – Southeast Region
Bureau of Resource Protection (Municipal)
20 Riverside Drive
Lakeville, MA 02347

Copies of toxicity tests and nitrogen optimization reports only to:

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

Any verbal reports, if required in **Parts I** and/or **II** of this permit, shall be made to both EPA-New England and to MassDEP.

G. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.

2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

3. Each agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of state law such permit shall remain in full force and effect under federal law as a NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

FRESHWATER CHRONIC
TOXICITY TEST PROCEDURE AND PROTOCOL
USEPA Region 1

I. GENERAL REQUIREMENTS

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

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

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

II. METHODS

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

III. SAMPLE COLLECTION AND USE

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

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

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

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

IV. DILUTION WATER

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

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

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

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

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

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

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

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

and

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

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

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

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

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

V.1. Use of Reference Toxicity Testing

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

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

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

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

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

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

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

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

VI. CHEMICAL ANALYSIS

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

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

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

Notes:

1. Hardness may be determined by:

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

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

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

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

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

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

2. Test Variability (Test Sensitivity)

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

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

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

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

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

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

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

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

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

2. *Pimephales promelas*

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

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

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

3. *Ceriodaphnia dubia*

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

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

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

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

In addition to the summary sheets the report must include:

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

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

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

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

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

II. METHODS

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

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

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

III. SAMPLE COLLECTION

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

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

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

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

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

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

and

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

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

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

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

V. TEST CONDITIONS

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

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

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

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

Footnotes:

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

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

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

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

Footnotes:

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

VI. CHEMICAL ANALYSIS

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

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

Notes:

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

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

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

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

No Observed Acute Effect Level (NOAEL)

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

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

NPDES PART II STANDARD CONDITIONS
(January, 2007)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

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

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

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

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

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

2. Permit Actions

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

3. Duty to Provide Information

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

4. Reopener Clause

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

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

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

5. Oil and Hazardous Substance Liability

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

6. Property Rights

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

7. Confidentiality of Information

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

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

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

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

8. Duty to Reapply

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

9. State Authorities

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

10. Other Laws

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

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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

b. Bypass not exceeding limitations

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

c. Notice

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

d. Prohibition of bypass

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

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

5. Upset

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

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

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

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

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

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

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

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

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

c. Records of monitoring information shall include:

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

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

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

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

2. Inspection and Entry

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

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

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

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

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

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

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

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

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

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

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

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

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

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

e. Twenty-four hour reporting.

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

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

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

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

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

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

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

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

2. Signatory Requirement

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

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

3. Availability of Reports.

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

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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

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

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

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

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

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

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

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

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

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

Construction Activities - The following definitions apply to construction activities:

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

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

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

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

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

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

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

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

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

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

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

Discharge of a pollutant means:

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

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

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

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

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

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

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

EPA means the United States "Environmental Protection Agency".

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NPDES means "National Pollutant Discharge Elimination System".

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

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

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

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

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

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

(a) Sewage from vessels; or

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Waters of the United States means:

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

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

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

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

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

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

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

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

(f) The territorial sea; and

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Range land is open land with indigenous vegetation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Commonly Used Abbreviations

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

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

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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND
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FACT SHEET

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

NPDES NO: MA0026182

PUBLIC NOTICE PERIOD: September 27, 2013 – October 26, 2013

NAME AND ADDRESS OF APPLICANT:

Wheaton College
East Main Street
Norton, Massachusetts 02766

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Wheaton College Wastewater Treatment Facility
East Main Street
Norton, Massachusetts 02766

RECEIVING WATER: Rumford River (Segment MA62-40)

CLASSIFICATION: B (Warm Water Fishery)

LATITUDE: 41º 58' 00" N **LONGITUDE:** 71º 11' 01" W

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

The above named applicant has requested that the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) reissue its NPDES permit to discharge into the designated receiving water, the Rumford River. The location of the facility and discharge is shown in Figure 1.

The existing facility is designed to treat 120,000 gpd of wastewater using an extended aeration package plant. A diagram of the existing facilities is shown in Figure 2. The major treatment units consist of a pump station, grinder, aeration tanks, clarifiers, flow meters and chlorine contact tanks.

Wastewater generated on campus is conveyed to a wet well equipped with two (2) submersible

pumps. The wet well is located just outside the machinery building of the wastewater treatment plant. The wastewater enters the plant through a 4-inch force main leading from the submersible pumps to a grinder to shred incoming solid material. The wastewater then passes through a manifold system that diverts flow to one of two treatment units (A and B) via 6-inch force mains.

Each treatment unit is comprised of a circular, peripheral aeration tank surrounding an inner circular clarifier. A segment of the aeration tank in Unit B is partitioned off as a sludge holding tank. Poly aluminum chloride (PAC) is added for phosphorus removal. Air for the aeration tanks is supplied by three blowers connected to drop pipes with diffusers.

Flow enters the aeration tank of each unit for activated sludge treatment and then is discharged to the clarifier through a submerged pipe located in the center of each treatment unit. The clarified effluent is discharged over a peripheral weir into the effluent channel. Clarifier effluent from both treatment units flows to chlorine contact tank 1, a compartment of a prefabricated above ground storage tank . After chlorine contact tank 1, flow proceeds through meter chamber B followed by a second chlorine contact tank (chlorine contact tank 2), which consists of two 1,500 gallon septic tanks.

Chlorine contact tank 1 can be bypassed, if needed, for maintenance. Under this bypass condition, flow from each unit is measured separately. The flow meter for Treatment Unit A is located in the meter chamber located adjacent to the control building. The meter for Treatment Unit B is meter chamber B. Flow in the metering chambers then combines in a single 8-inch pipe and then enters the chlorine contact tank 2.

Effluent is disinfected with sodium hypochlorite in chlorine contact tanks 1 and 2, followed by dechlorination with sodium bisulfate. Flow is then discharged to the Rumford River via a 1,100 foot long pipe to a ten inch submerged outfall.

Wasted sludge is first stored in a sludge storage tank in Treatment Unit B. Sludge is transferred from Unit B to a 900 gallon cone shaped thickening tank. Thickened sludge is then transferred to a sludge holding compartment in the prefrabricated tank. Sludge is periodically removed from this storage holding tank by a septage hauling truck.

In its application, the permittee requested an increase in the permitted flow from 120,000 gpd to 180,000 gpd in anticipation of adding more dormitories. At the request of the permittee, the flow increase request has been put on hold while the permittee is engaged in negotiations with the Town of Norton to potentially discharge their wastewater through an expanded Norton sanitary sewer system to the proposed Mansfield-Norton-Foxborough Regional Sewer District. Should the permittee seek to go forward with the request for a flow increase at a later time, it may do so through a request for permit modification. Any such request for permit modification should be accompanied by additional information in support of the request for flow increase, including the basis for the permittee's flow projections and an analysis of alternatives.

If the permittee reaches agreement to send wastewater to the Mansfield facility, the permitted flow of 0.12 mgd from Wheaton College may be transferred to the Mansfield facility as described in the Fact Sheet for the reissuance of the Mansfield WPAF, MA0101702 (April

2013), and the permittee can request a termination of its NPDES permit in accordance with 40 CFR §122.64.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on recent monitoring data is shown in Table 1.

III. Permit Limitations and Conditions

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

IV. Permit Basis and Explanation of Effluent Limitation Derivation

The Clean Water Act (CWA or the Act) prohibits the discharge of pollutants to waters of the United States without an NPDES permit unless such a discharge is otherwise authorized by the Act. An NPDES permit is used to implement technology-based and water quality-based effluent limitations as well as other requirements including monitoring and reporting. This draft NPDES permit was developed in accordance with statutory and regulatory authorities established pursuant to the Act. The regulations governing the NPDES program are found in 40 CFR Parts 122, 124 and 125 and Part 133 for secondary treatment.

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Act (see 40 CFR 125 Subpart A) to meet Best Practicable Control Technology Currently Available (BPT), Best Conventional Control Technology (BCT) for conventional pollutants, and Best Available Technology Economically Available (BAT) for toxic pollutants. In the absence of technology based guidelines, EPA is authorized to use Best Professional Judgment (BPJ) to establish effluent limitations, in accordance with Section 402 (a)(1) of the CWA.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards (MA SWQS), 314 CMR 4.00, include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site specific criteria is established. The State will limit or prohibit discharges of pollutants to surface waters to assure that surface water quality standards of the receiving waters are protected and maintained.

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

sensitivity of the species to toxicity and, where appropriate, the dilution of the effluent in the receiving water.

Section 402(o) of the CWA provides, generally, 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. Unless certain limited circumstances are met, "backsliding" from effluent limitations contained in previously issued permits that were based on CWA §§ 301(b)(1)(C) or 303 is prohibited. EPA has also promulgated anti-backsliding regulations, which are found at 40 CFR § 122.44(l). In addition, in accordance with regulations found at 40 CFR Section 131.12, MassDEP has developed and adopted a statewide antidegradation policy to maintain and protect existing in-stream water quality. The Massachusetts Antidegradation Provisions are found at 314 CMR 4.04. No lowering of water quality is allowed, except in accordance with the antidegradation provisions.

Waterbody Classification and Usage

The Rumford River is classified as a Class B, warm water waterbody. The MA SWQS at 314 CMR 4.05(3)(b) state that Class B waters shall have the following designated uses:

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

The *Taunton River Watershed 2001 Water Quality Assessment Report 2001* (the Water Quality Assessment Report) identifies this segment of the Rumford River as attaining the use for aesthetics with other uses not assessed. This segment of the Taunton River is similarly identified in the *Massachusetts Year 2012 Integrated List of Waters* as attaining the aesthetic use with other uses not assessed.

Flow and Dilution Factor

Water quality-based limitations are established with the use of a calculated available dilution. Title 314 CMR 4.03(3)(a) requires that effluent dilution be calculated using the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, recorded over a 10-year recurrence interval.

The current permit established the 7Q10 flow at the discharge using the 7Q10 flows at known points in the Three Mile River and the Wading River and applying a ratio of the respective drainage areas. The Wading River joins the Rumford River to form the Three Mile River. An examination of the data and the calculations used to develop the 7Q10 flows for the current permit are still valid. This dilution factor for the existing facility is calculated thus:

Dilution factor = (River 7Q10 @ Discharge + Design Flow) ÷ Design Flow
= (2.9 cfs + 0.186 cfs) ÷ 0.186 cfs = 17

BOD_5 and TSS

No effluent guidelines have been promulgated for privately owned treatment works such as the Wheaton College WWTF, which treats and discharges only domestic sewage. As discussed above, EPA is authorized to use Best Professional Judgment (BPJ) in these cases. Accordingly, the secondary treatment requirements for Publicly Owned Treatment Works (40 CFR Part 133) shall be used in establishing this permit's limits. The biochemical oxygen demand (BOD_5) and total suspended solids (TSS) mass limits are calculated as follows:

Mass Limit = Concentration limit * Design Flow * Conversion Factor = lbs/day

30-day average	30 mg/l * 0.12 mgd * 8.34 = 30 lbs/day
7-day average	45 mg/l * 0.12 mgd * 8.34 = 45 lbs/day

These limits are the same as in current permit for the existing facility and are retained in the draft permit.

The eighty-five percent (85%) removal requirement for BOD and TSS are based on BPJ, matching the secondary treatment requirements at 40 CFR Part 133, and are retained in this draft permit.

pH

The draft permit includes pH limitations based on the MA SWQS at 314 CMR 4.00 and are at least as stringent as pH limitations set forth at 40 C.F.R. §133.102(c). The MA SWQS require that Class B waters shall be in a range of 6.5 through 8.3 standard units (s.u.). MassDEP generally requires a permit range of 6.5 to 8.3 s.u. as a condition of state certification. The monitoring frequency remains the same at one (1) per day.

Bacteria

Limitations for bacteria in the existing permit are based upon state water quality standards for Massachusetts. There was one violation of the fecal coliform limit in the period June 2010 through June 2012.

The limits are modified in the Draft Permit to reflect the *E. coli* criteria in the revisions to the MA SWQS, 314 CMR 4.05(3)(b), approved by EPA in 2007. The monthly average limitation in the draft permit is 126 colony forming units (cfu) per 100 ml, expressed as a monthly geometric mean. The daily maximum limitation in the draft permit is 409 cfu/100 ml. These limitations are a State certification requirement and are consistent with EPA guidance recommending that no dilution be considered in establishing permit limits for discharges to rivers designated for primary contact recreation. *EPA Memorandum re: Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation*, November 12, 2008. The monitoring frequency is maintained at two times per week.

Total Residual Chlorine

The draft permit contains the same total residual chlorine (TRC) limits as the current permit but eliminates the seasonal period of April to October. Total residual chlorine monitoring is required whenever chlorine is added to the treatment process. TRC sampling is not required if chlorine is not added for disinfection or other purpose. The limitations are in effect year-round.

The limits are based on the criteria set forth in EPA, *National Recommended Water Quality Criteria 2002*, as adopted into the MA SWQS, 314 CMR 4.00. The in-stream criteria shall not exceed 11 ug/l for chronic toxicity and 19 ug/l for acute toxicity in order to protect aquatic life. Based upon the dilution factor of 17.0, the TRC permit limits are calculated below.

Chronic chlorine limit	11 ug/l * 17.0 (dilution factor) = 187 ug/l = 0.19 mg/l
Acute chlorine limit	19 ug/l * 17.0 (dilution factor) = 323 ug/l = 0.32 mg/l

Phosphorus

The draft permit continues the existing phosphorus limit of 1 mg/l. The current permit includes a phosphorus concentration limit of 1.0 mg/l and a mass limit of 1 lb/day because at the time of its issuance the *Massachusetts Year 2004 Integrated List of Waters* identified segment MA62-15 into which the Wheaton College WWTP discharged as requiring a TMDL due to organic enrichment/low DO. While that is no longer the case because that segment has been divided into 3 segments (this segment, MA62-40, is a Category 2 water in the *Massachusetts Year 2012 Integrated List of Waters)*, downstream segments of the Taunton River are on the *Massachusetts Year 2012 Integrated List of Waters* 303(d) list due to organic enrichment/low DO .

The MA SWQS (314 CMR 4.04(5) Control of Eutrophication) require any existing point source discharge containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae to be provided with the highest and best practicable treatment to remove such nutrients.

EPA has published national guidance documents which contain recommended total phosphorus criteria and other indicators of eutrophication. In order to control eutrophication, EPA's *Quality Criteria for Water 1986* (the Gold Book) recommends that in-stream phosphorus concentrations should be less than 100 ug/l (0.100 mg/l) in streams or other flowing waters not discharging directly to lakes or impoundments.

More recently, EPA released Ecoregional Nutrient Criteria, established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published ecoregion-specific criteria represent conditions in waters minimally impacted by human activities, and thus representative of water without cultural eutrophication. The Wheaton College WWTF is within Ecoregion XIV, Eastern Coastal Plain, Northeastern Coastal Zone. Recommended criteria for this ecoregion is found in *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV,* published in December 2001, and includes a total phosphorus criteria of 23.75 ug/l (0.024 mg/l).

The effects-based approach is usually taken because it is more directly associated with an impairment to a designated use (e.g. fishing). The effects-based approach provides a threshold value above which water quality impairments are likely to occur. It applies empirical observations of a causal variable (i.e. phosphorus) and a response variable (i.e. algal growth) associated with designated use impairments. Referenced-base 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 calculating phosphorus limits for the facility, the in-stream concentration of the receiving water is taken into consideration. According to the Water Quality Assessment report, three samples taken in July, August, and September 2001 in the Rumford River near Reservoir Street (station RR05) upstream of the College's discharge averaged an in-stream phosphorus concentration of 0.036 mg/l. Using the Gold Book criteria and accounting for this in-stream concentration, a permit limit for phosphorus is calculated as follows:

$$\{(Q_R + Q_{WWTP}) * C_{WQ} - (Q_R * C_R)\} / Q_{WWTP} = C_{WWTP}$$

where:

Q_R = 7Q10 flow of the Rumford River = 2.9 cfs
Q_{WWTP} = Design Flow of Wheaton College WWTF
C_{WQ} = In-stream water quality criteria = 100 ug/l
C_R = In-stream phosphorus concentration = 36 ug/l
C_{WWTP} = Phosphorus concentration limit for Wheaton College WWTF

Using the existing design flow of 0.12 mgd (0.186cfs), a phosphorus limit for the existing facility is calculated as follows.

$$[((2.9 \text{ cfs} + 0.186 \text{ cfs}) * 100 \text{ ug/l}) - (2.9 \text{ cfs} * 36) \text{ ug/l}] / 0.186 \text{ cfs} = 1{,}098 \text{ ug/l} = 1.1 \text{ mg/l}$$

The draft permit maintains the 1.0 mg/l concentration limit and 1 lb/day mass limit for the existing facility due to antibacksliding requirements and considering the little difference between the existing and calculated concentration limits.

Nitrogen

Nutrient analyses conducted in the Taunton River Estuary and Mount Hope Bay have demonstrated that excessive nitrogen loadings are causing significant water quality problems in these waters, including algae blooms and low dissolved oxygen. A three-year water quality monitoring study was conducted by the School for Marine Science and Technology at UMass-Dartmouth (SMAST) and involved monthly sampling at 22 sites across Mount Hope Bay and the Taunton River Estuary from 2004 to 2006. This study showed that average chlorophyll-a over the three year period was above 10 ug/l at all monitoring stations across the Taunton River Estuary and Mount Hope Bay. The 20th percentile DO concentrations for the three-year period were below the 5.0 mg/l water quality standard at four of the six sites in the Taunton River Estuary (MHB 1, 2 and 18-21). SMAST, *Summary of Water Quality Monitoring Program for the Mount Hope Bay Embayment System (2004 – 2006)* at 24 (August 16, 2007). Total nitrogen (TN) concentrations are elevated throughout the system, with a three year average TN concentration above 0.5 mg/l at sixteen of the 22 sites and above 0.45 mg/l at 21 of 22 sites.

SMAST, 2007. Total Nitrogen concentrations are generally highest in the tidal rivers, including the Taunton River, and molar N/P ratios are consistent with nitrogen limitation.

Based on these data, the SMAST report concluded:

> Given the high population within the watershed and resultant N loading to this down gradient estuary and the observed high chlorophyll levels and oxygen depletions, it is not surprising that nitrogen levels are moderately to highly enriched over offshore waters. The Taunton River estuarine reach, as the focus of upper watershed N loading, showed very high total nitrogen levels (TN) in its upper reach (1.058 mg N L^{-1}) and maintained high levels throughout most of its reach (>0.6 mg N L^{-1}). The main basin of Mt. Hope Bay supported lower TN levels primarily as a result of mixing with incoming waters (generally 0.5-0.6 mg N L^{-1}). This is consistent with the observed oxygen depletions and infauna animal communities. The highest (Moderate) water quality was found at the stations in the main basin and lower reaches of Mt Hope Bay out to the channels to lower Narragansett Bay and the Sakonet River (Figure 6).
> . . .
> In general, the Taunton River Estuary, with its large watershed N load and high TN levels, is showing poor water quality due to its high chlorophyll and oxygen depletions. The main basin of Mt. Hope Bay, with its greater flushing and access to higher quality waters of the lower Bay, is showing less impairment with moderate water quality. Finally, the lower basin of Mt. Hope Bay, nearest the tidal "inlet", is generally showing moderate water quality. . . . [T]hese data indicate that the MEP analysis of this system should focus on restoration of the main basin of Mt. Hope Bay and the Taunton River estuarine reach, and that it is likely that restoration of the Taunton River Estuary will have a significant positive effect on the habitat quality of the main basin of Mt. Hope Bay.

Consistent with these conclusions, EPA has performed a loading analysis to determine appropriate permit limits on total nitrogen for facilities discharging to the Taunton River system. See, e.g., *Fact Sheet* for Taunton WWTP Draft Permit, NPDES No. MA0100897 (March, 2013).

Currently the Wheaton College discharge of nitrogen to this system, averaging approximately 9 pounds/day in 2010-2012, is considered insignificant in the context of overall POTW loads (approximately 1,800 lb/day) and total watershed loads (4,228 lb/day). Therefore no numeric permit limit is set in this permit reissuance. However, EPA has included in the draft permit a requirement to optimize nitrogen removal. The draft permit also includes a requirement to submit a report to the permitting agencies within one year, summarizing the measures taken to enhance the removal of nitrogen by its treatment facility and the effectiveness of these measures. EPA has also continued the nitrogen monitoring requirements of the current permit.

EPA notes that the greatest reduction in nitrogen discharges for this facility would be achieved via a tie-in to the Mansfield facility, which EPA plans to issue a 5 mg/l monthly average total nitrogen limit (see the Mansfield WWTP permit, recently released for public comment). Therefore, if the permittee enters into a binding agreement to send its wastewater to the Mansfield facility, the optimization requirement will be waived. EPA expects that, should the permittee enter into such an agreement, the tie-in would be completed within this permit term; if that is not the case EPA will revisit the waiver of the optimization requirement.

Metals

The draft permit includes new monthly average effluent limits for aluminum and lead and new monthly average and daily maximum limits for copper.

Examination of effluent analysis conducted in connection with WET testing in the past five years indicates that the Wheaton College discharge has included detectable levels of the metals aluminum, copper, lead, nickel and zinc. EPA therefore analyzed the available data on effluent and receiving water concentrations to determine whether these pollutants "are or may be discharged at a level that causes, has reasonable potential to cause, or contributes to an excursion above" the water quality standard. 40 CFR 122.44(d)(1)(i).

Table 2 shows the concentrations of metals in the Wheaton College effluent and receiving water samples from 2008 through 2012. EPA bases its determination of "reasonable potential" on a characterization of the upper bound of expected effluent concentrations based on a statistical analysis of the available monitoring data. As noted in the *Technical Support Document for Water Quality Based Toxics Control* (EPA 1991) ("TSD"), "[a]ll monitoring data, including results for concentrations of individual chemicals, have some degree of uncertainty associated with them. The more limited the amount of test data available, the larger the uncertainty." Thus with a limited data set, the maximum concentration that has been found in the samples may not reflect the full range of effluent concentration. On the other hand, individual high data points may be outliers or otherwise not indicative of the normal range of effluent concentrations.

Table 2. Effluent Analytical Data

	Effluent Analytical Data (ug/l total recoverable metal)						
	Hardness (mg/l)	**Al**	**Cd**	**Cu**	**Ni[1]**	**Pb[1]**	**Zn**
5/15/2008	80	500	ND-0.5	38	ND-3	2.5	71
6/2/2008	110	300	ND-0.5	19	ND-3	1	73
8/11/2008	93	170	ND-0.5	34	5	3	31
5/11/2009	70	240	ND-0.5	20	3	ND-0.5	27
8/10/2009	83	320	ND-0.5	30	4	5.7	41
5/10/2010	68	150	ND-0.5	24	3	0.8	31
8/9/2010	50	440	ND-0.5	26	3	4	34
5/9/2011	76	410	ND-0.5	11	ND-2	ND-0.5	22
8/15/2011	91	160	ND-0.5	20	3	1	19
5/14/2012	69	220	ND-0.5	17	ND-2	ND-0.5	24
8/14/2012	66	190	ND-0.5	22	3	0.7	14
Median	76	240	ND-0.5	22	3.0	ND	31
95th percentile[2]		1038	ND-0.5	40	4.5	5.9	72
Chronic Criterion[3]		87	0.14	4.20	24	1.0	54
Acute Criterion[3]		750	0.83	5.81	213	25	54

1 Non-detects noted as " ND- [minimum detection level]"

2 Percentiles calculated from a lognormal distribution with mean and standard deviation derived from monitoring data

3 Expressed in Total Recoverable Metals for consistency with monitoring data. Criteria for Cd, Ni, Pb and Zn are hardness dependent and calculated using the formulas set forth in EPA, *National Recommended Water Quality Criteria 2002* at a hardness of 39 mg/l, based on the median hardness of effluent and receiving water combined proportional to design flow and 7Q10 flow.

To account for this, EPA has developed a statistical approach to characterizing effluent variability. As "experience has shown that daily pollutant discharges are generally lognormally distributed," *TSD* at App. E, EPA uses a lognormal distribution to model the shape of the observed data, unless analysis indicates a different distributional model provides a better fit to the data. The model parameters (mean and variance) are derived from the monitoring data.

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

$$X_p = \exp(\mu_y + z_p \sigma_y), \qquad \text{where } \mu_y = \text{mean of Y}, \ \sigma_y = \text{standard deviation of Y}, \ Y = \ln[X]$$

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

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

This upper percentile values is used to determine whether a discharge has a reasonable potential to cause or contribute to an exceedance of a water quality standard The combination of these upper bound effluent concentrations with dilution in the receiving water is calculated to determine whether the water quality criteria will be exceeded. The *TSD* also includes a procedure for determine such percentiles when the dataset includes non-detect results, as is the case for Wheaton College, based on a delta-lognormal distribution. The statistical analyses for the metals with non-detect results (lead and nickel) are set forth in Attachment A.

The receiving water concentration is calculated taking into account dilution at 7Q10 conditions, through a mass balance equation that accounts for concentrations in the Rumford River upstream of the discharge as reported in the facility's WET test reports:

$$\text{Receiving water concentration } (C_r) = \frac{(C_d * Q_d + C_s * Q_s)}{(Q_d + Q_s)} \text{ ; where}$$

C_d = upper bound effluent concentration data (95^{th} percentile)
Q_d = Design flow of facility
C_s = Median concentration in Rumford River upstream of discharge
Q_s = 7Q10 streamflow in Rumford River upstream of discharge

The projected receiving water concentrations are compared to the water quality criteria from EPA, *National Recommended Water Quality Criteria 2002*, which have been incorporated into the MA SWQS, 314 CMR 4.00. For cadmium, nickel, lead and zinc the water quality criteria are hardness dependent. Because the reasonable potential analysis is performed using dilution under 7Q10 conditions, a projected hardness under 7Q10 conditions is calculated using the same mass balance equations and the median hardness of the effluent (76 mg/l) and upstream receiving water (37 mg/l), for a calculated hardness of 39 mg/l.

Table 3 shows the result of the mass balance equations.

Table 3. Mass Balance and comparison to water quality criteria

Pollutant	Qd (mgd)	Cd (ug/l_{tr})	Qs (mgd)	Cs (ug/l_{tr})	$(C_r) = \frac{(C_d * Q_d + C_s * Q_s)}{(Q_d + Q_s)}$	Criterion (expressed as total recoverable metal)
Al chronic	0.12	1038	1.87	73	131	87
Al acute					131	750
Cd chronic		ND-0.5		ND-0.5	ND	0.14
Cd acute					ND	0.83
Cu chronic		40		4	6.2	4.20
Cu acute					6.2	5.81
Ni chronic		4.5		ND-2	<2.2*	24
Ni acute					<2.2*	213
Pb chronic		5.9		0.8	1.1	1.0
Pb acute					1.1	25
Zn chronic		72		5.5	9.5	54
Zn acute					9.5	54

* calculated using detection limit for receiving water concentration

The results indicate that the aluminum, copper and lead discharges have a reasonable potential to cause exceedances of the water quality criteria for these pollutants. Therefore an effluent limit is included in the draft permit that will achieve the water quality criteria, calculated as follows:

$$\text{Permit limit} = \frac{(Q_d + Qs) * \text{Criterion} - Q_s * C_s}{Q_d}$$

Aluminum avg monthly limit = $[(0.12 + 1.87)*87 – 1.87*73]/0.12 = 305$ ug/l_{tr}
Copper avg monthly limit = $[(0.12 + 1.87)*4.2 – 1.87*4]/0.12 = 7.3$ ug/l_{tr}
Copper max daily limit = $[(0.12 + 1.87)*5.8 – 1.87*4]/0.12 = 33.9$ ug/l_{tr}
Lead avg monthly limit = $[(0.12 + 1.87)*0.97 – 1.87*0.8]/0.12 = 3.6$ ug/l_{tr}

Monitoring results for cadmium, nickel and zinc do not indicate a reasonable potential to exceed water quality criteria.

Whole Effluent Toxicity

The MA SWQS require that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance in the interpretation of the following narrative criteria:

> *"All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife."*

National studies conducted by EPA have demonstrated that domestic sources contribute toxic constituents to WWTPs. These constituents include metals, chlorinated solvents and aromatic hydrocarbons among others. The impact of the toxicity of several constituents in a single effluent is accomplished through whole effluent toxicity (WET) testing.

The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing including any

synergistic effects of pollutants; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in conjunction with pollutant specific control procedures to control the discharge of toxic pollutants.

Based on the potential for toxicity and in accordance with EPA regulation and policy, the draft permit includes acute toxicity limitations and chronic toxicity monitoring requirements. (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 50 Fed. Reg. 30,784 (July 24, 1985); see also, EPA's Technical Support Document for Water Quality-Based Toxics Control). EPA Region I has developed a toxicity control policy which requires wastewater treatment facilities to perform the toxicity testing in order to meet the state certification requirement. The frequency and type of WET tests depend on the dilution factor and risk factor.

Pursuant to EPA Region 1 policy, and the MassDEP Implementation Policy for the Control of Toxic Pollutants in Surface Waters, discharges having a dilution ratio between 10:1 and 20:1 require chronic and acute toxicity testing with a $LC_{50} \geq 100\%$ four times per year. In September, 2005 the permittee requested a reduction in the frequency of WET testing based upon previous WET test results. In January, 2006 EPA approved that request and reduced the frequency of WET testing to twice per year, and that WET testing frequency is retained in the draft permit.

The requirements for WET testing recently changed. It has come to EPA Region 1's attention that the modified acute toxicity test in the current permit, which is conducted as part of the chronic toxicity test, is not an approved method under 40 CFR Part 136. As of March 2013 the modified acute testing requirement is being replaced by a standalone acute toxicity test. The acute toxicity testing protocol is Attachment B to the draft permit, while the revised chronic protocol (eliminating the "modified acute" component) is Attachment A.

V. Operation and Maintenance

The permit standard conditions for 'Proper Operation and Maintenance' are found at 40 CFR § 122.41(e). These require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. Similarly, the permittee has a "duty to mitigate" as stated in 40 CFR § 122.41(d). This requires the permittee to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment. EPA and MassDEP have included specific operation and maintenance requirements for the wastewater treatment plant and collection system. These requirements may be found in Part I.C. of the permit and include requirements for adequate staffing, preventative maintenance, infiltration and inflow (I/I) control, and alternate power needed at pump stations.

As the permittee is not a POTW and has a less extensive collection system than a typical POTW, EPA has not included in the draft permit the standard collection system operation and maintenance requirements that are currently included in POTW permits. However, the facility does experience high flows during wet weather indicative of I/I in the system. I/I is extraneous water entering the wastewater collection system through a variety of sources. Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point

sources such as roofleaders, yard and area drains, sump pumps manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow reducing the capacity and the efficiency of the treatment works and may cause bypasses of secondary treatment. It greatly increases the potential for sanitary sewer overflows in separate systems and combined sewer overflows in combined systems. Therefore the permit requires that the permittee shall develop an I/I removal plan.

VI. Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16U.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 and do not include the Rumford River or the Three Mile or Taunton Rivers to which the Rumford River discharges.

VII. Endangered Species Act (ESA)

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) administers Section 7 consultations for freshwater species, where as the National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

EPA has determined that no federally-listed or proposed, threatened or endangered species or critical habitat are known to occur in the Rumford River or Three Mile River. Atlantic Sturgeon have been identified in the Taunton River but are not known to utilize tributaries to the Taunton River such as the Rumford and Three Mile Rivers, and the discharge is located an extensive distance (approximately fourteen miles) from the Taunton mainstem, making it highly unlikely that Atlantic Sturgeon will be present in the vicinity of the discharge. Furthermore, the effluent limitations and other permit requirements identified in this Fact Sheet are designed to be protective of all aquatic species. Therefore, consultation under Section 7 of the ESA with NMFS and USFWS is not required.

VIII. State Certification Requirements

EPA may not issue a permit unless MassDEP certifies that the effluent limitations included in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The MassDEP has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR § 124.53 and expects the draft permit will be certified.

IX. Comment Period and Procedures for Final Decision

All persons, including applicants, who believe any condition of the permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to the EPA and MassDEP contacts listed below. Any person prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues to be raised in the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

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

X. EPA and MA DEP Contacts

Additional information concerning the draft permit may be obtained between the hours of 9 am and 5 pm, Monday through Friday from:

Susan Murphy
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109
Telephone: (617) 918-1534 Fax: (617) 918-0534
Email: murphy.susan@epa.gov

Claire Golden
Massachusetts Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887
Telephone: (978) 694-3244 Fax (978) 694-3498
Email: claire.golden@state.ma.us

Ken Moraff, Acting Director
Office of Ecosystem Protection
U.S. EPA

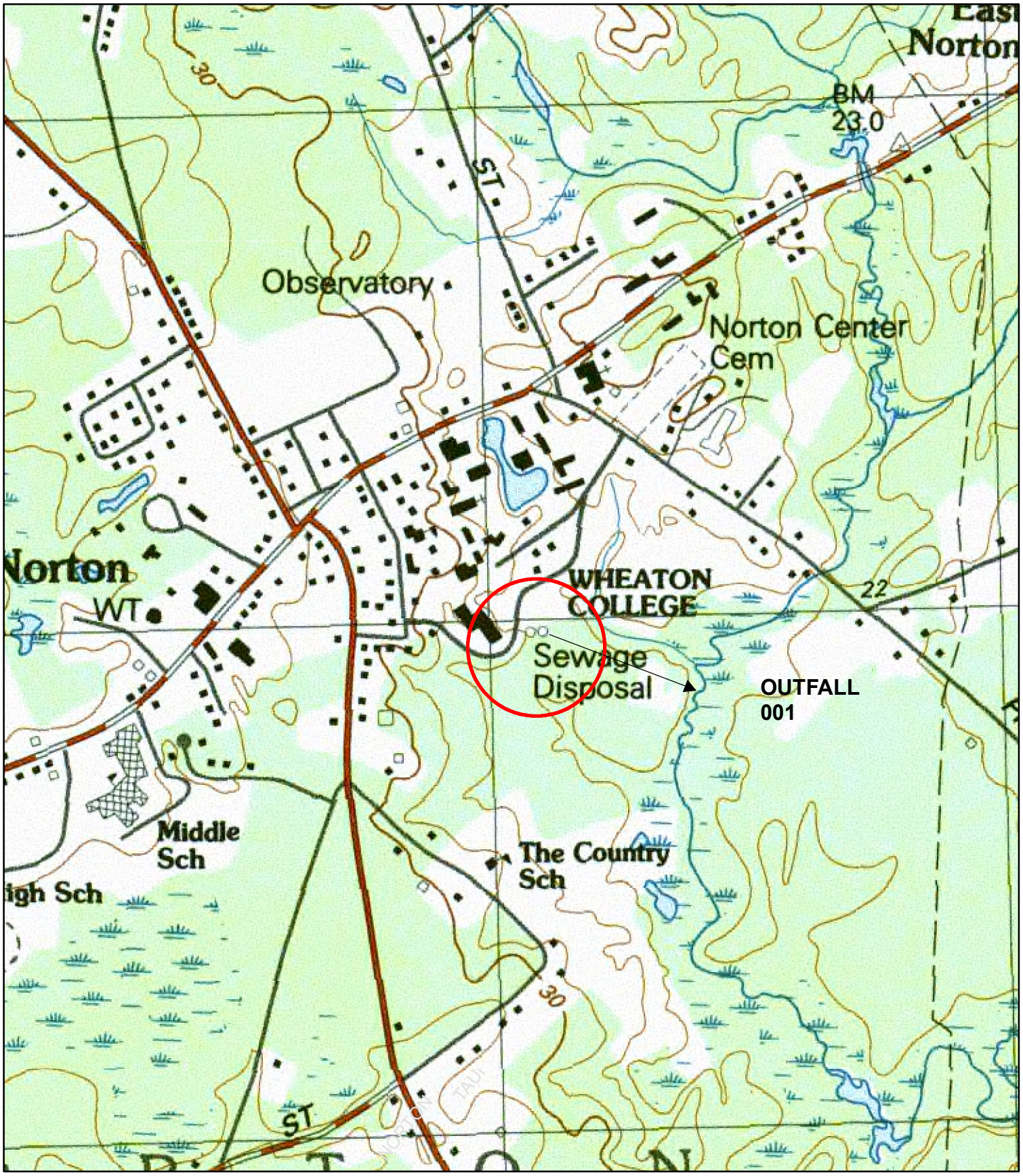

Figure 1. Location Map
Wheaton College WWTF
NPDES No. MA0026182

LE LEVEL ELEMENT
ORP ORP PROBE
CL2 CHLORINE RESIDUAL PROBE
DE TURBIDITY PROBE
DO DISSOLVED OXYGEN PROBE
pH pH PROBE
SUBMERSIBLE PUMP
CHECK VALVE
BALL VALVE
THREE WAY VALVE
GATE VALVE
TRASH PUMP
AIR-LIFT PUMP
V-NOTCH WEIR
FM FLOW METER

PLANT INFLUENT
INFLUENT FLOWMETER
INFLUENT PUMP STATION
SCREENINGS
OVERFLOW TO AERATION TANK B
INFLUENT STEP SCREEN
AERATION TANK B TRANSFER LINE
AERATION TANK A TRANSFER LINE
RETURN ACTIVATED SLUDGE
POLYMER INJECTION POINT
PACL INJECTION POINT
SEE NOTE 1
AERATION TANK B
CLARIFIER B
WASTE ACTIVATED SLUDGE
HYPO CARRIER WATER
HYPO INJECTION POINT
SEASONAL DISINFECTION SYSTEM BY-PASS LINE
EFFLUENT METERING PIT B
CHLORINE CONTACT TANK #1
(RAIN-FOR-RENT FRAC TANK)
CHLORINE CONTACT TANK SCUM LINE
AERATION TANK B DRAIN
AERATION TANK GRAVITY EQUILIZATION LINE
AERATION TANK A DRAIN
AERATION TANK A
CLARIFIER A
CHLORINE CONTACT TANK DRAIN
EFFLUENT METERING PIT A
IN-TANK BAFFLE WALL AND MIXING PIPE FOR BISULFITE ADDITION
DECHLORINATION CHAMBER
PLANT EFFLUENT
CHLORINE CONTACT TANK #2
BISULFITE INJECTION POINT
CL2
DE
PLANT DRAIN
CAUSTIC INJECTION POINT
PLANT DRAIN MANHOLE
SLUDGE THICKENING TANK
TRUCK CONNECTION
WAS TRANSFER PUMP
OVERFLOW TO PLANT DRAIN
WASTE ACTIVATED SLUDGE HOLDING TANK
("PIE" SECTION OF AERATION TANK B)
WASTE ACTIVATED SLUDGE STORAGE TANK
(RAIN-FOR-RENT FRAC TANK)

NOTES:

1) CLOUDED ELEMENTS ON THIS SHEET DEPICT SYSTEMS INTENDED TO SATISFY THE CHLORINE, PHOSPHOROUS, AND pH LIMITS OF THE FACILITY'S PERMIT (NPDES PERMIT NO. MA0026182) AS REQUIRED BY THE ADMINISTRATIVE CONSENT ORDER FILE NUMBER ACO-SE-1N002 AND ARE INCLUDED AS PART OF THE WP68 APPLICATION.

WOODARD & CURRAN
Engineering · Science · Operations
800-446-5518
DEDHAM, MASSACHUSETTS

REV	DESCRIPTION	DATE

DESIGNED BY: TFH
DRAWN BY: TFH
CHECKED BY: ASF
FILE: WP68.DWG

PROCESS FLOW ONE-LINE

WHEATON COLLEGE
NORTON, MA

BRP WP68 PERMIT APPLICATION
ACO-SE-1N002

JOB NO.: 212588.12
DATE: APRIL 2005
SCALE: NOT TO SCALE
SHEET: 1 OF 2

PR-01

NPDES Permit No. MA0026182

Table 1 (page 1 of 2)
Two year facility DMR Data

	Flow (MGD)		BOD (mg/l)		TSS (mg/l)		fecal colilform (cfu/100 ml)		TRC (mg/l)		pH	
	mo avg	daily max	mo avg	wkly avg	mo avg	wkly avg	mo avg	daily max	mo avg	daily max	min	max
Effluent Limit:	0.12	0.16	30	45	30	45	200	400	0.19	0.32	6.5	8.3
Sampling Frequency:	CONTINUOUS		5/week		5/week		1/week		3/day		5/week	
June 2010	0.01	0.06	5	7	5	6	1	11	0.02	0.13	6.8	7.9
July	0.02	0.04	4	6	4	5	1	3	0.02	0.1	6.8	7.9
August	0.01	0.03	6	11	6	8	3	7,700	0.02	0.14	6.6	8
September	0.06	0.07	12	19	11	16	3	47	0.03	0.08	6.8	7.8
October	0.06	0.11	5	10	6	16	3	35	0.03	0.14	6.9	7.8
November	0.05	0.11	3	4	7	12					6.9	7.9
December	0.04	0.08	5	10	19	24					7.2	8
January 2011	0.02	0.05	9	16	29	46					6.9	7.9
February	0.07	0.09	15	35	24	43					6.7	8
March	0.05	0.08	7	14	13	15					7.5	8.1
April	0.06	0.13	4	8	15	21	1	19	0.03	0.2	6.7	8.1
May	0.04	0.07	9	13	13	23	1	7	0.02	0.08	7	7.9
June	0.02	0.03	4	13	6	23	1	6	0.01	0.05	7.1	7.8
July	0.02	0.06	4	7	6	10	1	8	0.03	0.07	6.7	7.7
August	0.02	0.04	21	40	7	12	7	19	0.04	0.09	6.6	7.9
September	0.07	0.09	10	34	9	14	5	23	0.05	0.08	6.7	8.2
October	0.06	0.1	4	8	10	13	1	21	0.05	0.18	7.2	8.1
November	0.06	0.08	3	6	9	11					7.4	8.2
December	0.03	0.09	3	3	8	11					7.2	8.1
January 2012	0.02	0.09	3	3	5	8					7.1	8.1
February	0.09	0.1	7	11	14	16					7.1	8.1
March	0.07	0.1	4	10	7	12					7.2	8.2
April	0.09	0.12	10	19	8	13	1	5	0.03	0.05	6.9	8.1
May	0.07	0.11	4	13	7	10	1	34	0.04	0.11	7	7.9
June	0.03	0.04	4	13	7	8	1	6	0.04	0.06	7.2	7.8
Average:	0.05		6.6		10.2		2.1	529.6				
Maximum:		0	21	40		46	7	7700			6.6	8.20

NPDES Permit No. MA0026182

Table 1 (page 2 of 2)
Two year facility DMR Data

	Whole Effluent Toxicity - daphnid		Whole Effluent Toxicity - minnow		Total P (mg/l)	NH3 (mg/l)	Nitrate (mg/l)	Nitrite (mg/l)	TKN (mg/l)	Total N (mg/l)	Total N (lb/day)
	LC50 %	CNOEC	LC50 %	CNOEC	mo avg	wkly avg	wkly avg	wkly avg	wkly avg	wkly avg	wkly avg
	≥ 100	Report	≥ 100	Report	1	Report	Report	Report	Report	(Calculated)	(Calculated)
Sampling Frequency:	2/year		2/year		1/month	1/month	1/month	1/month	1/month	(Calculated)	(Calculated)
June 2010					0.1	0.1	10	0.42	1	10.52	0.77
July					0.1	0.3	9.1	0.01	1.3	9.41	1.15
August	100%	100%	100%	100%	0.1	0.1	13	0.01	1	13.11	0.92
September					0.1	0.3	33	0.12	2.2	33.42	16.17
October					0.6	0.3	28	0	1.6	28.3	19.82
November					0.2	0.1	26	0.01	1.3	26.11	16.39
December					0.4	0.5	34	0.01	1.8	34.51	13.28
January 2011					0.6	2	2.8	0.01	3.6	4.81	2.44
February					0.8	1.6	6	0.8	4	8.4	18.56
March					0.5	0.8	22	0.72	1.6	23.52	9.72
April					0.4	0.1	14	0.01	1.7	14.11	15.87
May	100%	6.25%	100%	100%	0.2	0.9	19	0.78	2	20.68	1.79
June					0.3	0.3	7.8	0.62	1.7	8.72	1.72
July					0.2	0.2	5.6	0.01	1.2	5.81	1.77
August	100%	100%	100%	25%	0.1	0.1	10	0.01	0.9	10.11	2.32
September					0.4	0.1	30	0.01	0.5	30.11	16.64
October					0.3	0.3	38	0.01	1.5	38.31	10.26
November					0.3	1.2	38	0.01	2.1	39.21	7.06
December					0.4	0.5	38	0.01	0.6	38.51	5.16
January 2012					0.2	0.2	11	0.01	1.1	11.21	2.35
February					0.5	2.2	27	0.34	3	29.54	22.77
March					0.7	1.6	21	0.42	3.2	23.02	11.45
April					0.5	3.8	30	0.31	4.4	34.11	13.29
May	100%	100%	100%	12.50%	0.4	1.3	2.6	0.2	1.8	4.1	8.17
June					0.2	0.1	8	0.01	0.9	8.11	3.48
Average:					0.34	0.76	19.36	0.19	1.84	20.31	8.93
Maximum:											

Date	Pb* (ug/l)	lnPb (ug/l)	$(y_i - u_y)^2$
5/15/2008	2.5	0.9163	0.1197576
6/2/2008	1	0.0000	0.325163
8/11/2008	3	1.0986	0.2791872
5/11/2009	0		
8/10/2009	5.7	1.7405	1.3694512
5/10/2010	0.8	-0.2231	0.6294426
8/9/2010	4	1.3863	0.66596
5/9/2011	0		
8/15/2011	1	0.0000	0.325163
5/14/2012	0		
8/14/2012	0.7	-0.3567	0.8591539

Pb- (Lognormal distribution, ND)

Daily Maximum Effluent Derivation (some measurements < detection limit)

Detection Limit** =	0.5
u_y = Avg of Nat. Log of daily Discharge (mg/L) =	0.57023
S $(y_i - u)^2$ =	4.57328
k = number of daily samples =	11
r = number of non-detects =	3
s_y^2 = estimated variance = $(S[(y_i - u_y)^2]) / (k-r-1)$ =	0.65333
s_y = standard deviation = square root s_y^2 =	0.80829
δ = number of nondetect values/number of samples =	0.27273
z 99th percentile=z-score[(0.99-δ)/(1-δ)] =	2.20435
z 95th percentile=z-score[(0.95-δ)/(1-δ)] =	1.485165457

Daily Max = exp (u_y + z-score*s_y)

99th Percentile Daily Max Estimate= 10.5063 ug/l

95th Percentile Daily Max Estimate = 5.8748 ug/l

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

Date	Ni* (ug/l)	lnNi (ug/l)	$(y_i - u_y)^2$
5/15/2008	0		
6/2/2008	0		
8/11/2008	5	1.6094	0.157413
5/11/2009	3	1.0986	0.0130125
8/10/2009	4	1.3863	0.0301403
5/10/2010	3	1.0986	0.0130125
8/9/2010	3	1.0986	0.0130125
5/9/2011	0		
8/15/2011	3	1.0986	0.0130125
5/14/2012	0		
8/14/2012	3	1.0986	0.0130125

Ni- (Lognormal distribution, ND)

Daily Maximum Effluent Derivation (some measurements < detection limit)

Detection Limit** =	3.0
u_y = Avg of Nat. Log of daily Discharge (mg/L) =	1.21268
S $(y_i - u)^2$ =	0.25262
k = number of daily samples =	11
r = number of non-detects =	4
s_y^2 = estimated variance = $(S[(y_i - u_y)^2]) / (k-r-1)$ =	0.04210
s_y = standard deviation = square root s_y^2 =	0.20519
δ = number of nondetect values/number of samples =	0.36364
z 99th percentile=z-score[(0.99-δ)/(1-δ)] =	2.15160
z 95th percentile=z-score[(0.95-δ)/(1-δ)] =	1.414746426

Daily Max = exp (u_y + z-score*s_y)

99th Percentile Daily Max Estimate= 5.2287 ug/l

95th Percentile Daily Max Estimate = 4.4950 ug/l

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

Wheaton College Wastewater Treatment Facility - Response to Comments

On September 27, 2013, the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) public noticed a Draft Permit (MA0026182) for the Wheaton College Wastewater Treatment Facility.

EPA received comments from Wheaton College by letter dated October 15, 2013. The following are responses to all significant comments received and descriptions of any changes made to the public-noticed permit as a result of those comments. In addition, the Final Permit has address changes from those in the Draft Permit for submitting reports to the MassDEP. The permittee should send reports to the MassDEP at the addresses shown in Section F, Monitoring and Reporting of the Final Permit.

Comment 1. Effluent flow: the proposed limits (0.12 MGD monthly average and 0.16 MGD daily maximum) are carried over from the previous permit. We feel that an annual12-month rolling average flow of 0.12 MGD would be most appropriate and in keeping with EPA's general approach to flow in NPDES permits (note that the recently public noticed Town of Mansfield draft permit has an annual 12-month rolling average flow). In addition, we request the daily maximum flow limit be removed as it is also EPA's practice to not have such a flow limit.

> **Response 1.** EPA disagrees with the comment, as the College operates a privately owned treatment works and is not a Publicly Owned Treatment Works (POTW) like the Town of Mansfield (now the MFN Regional Wastewater District) and other facilities that have received a 12-month rolling average permit limit.
>
> The comment accurately describes EPA's practice with respect to POTW NPDES permits, which have transitioned from monthly average to 12-month rolling average limits without daily maximum flow limits. This practice was implemented consistent with MassDEP policy to reflect the actual design considerations for flow to POTWs, which have extensive collection systems that receive I/I contributions that result in seasonal fluctuations in flow. It is not EPA's practice to incorporate 12-month rolling average flow limits in privately owned treatment works permits, where collection systems are less extensive and the operator is likely to have greater control over inputs to the system as well. Unlike a typical POTW, Wheaton College's system is limited to a campus area and primarily (if not exclusively) serves buildings also owned and operated by Wheaton College, so there is less pipe length for infiltration and greater control over sources of inflow.

Comment 2. The effluent monitoring frequency for several parameters (BOD, TSS, bacteria, phosphorus, nitrogen, metals) have been substantially increased without merit. In addition, the new metals testing is very extensive (For example, the BOD and TSS monitoring has been increased from one time per week to three times per week and the phosphorus and nitrogen monitoring is proposed for one per week versus one per month

in the existing permit). As seen in the data in Table 1 of the Fact Sheet, the historical record shows excellent treatment for those parameters and full compliance over several years. The College requests that the monitoring be changed to reflect the following frequencies: BOD, TSS and E. coli at one per week, nitrogen and phosphorus at one per month and aluminum, copper and lead at a quarterly frequency). The College has estimated that testing at the proposed, new frequency would cost greater than $10,000 per year and would provide little or no benefit. The College would prefer to spend these funds in a manner that will enhance the operation of the WWTF.

> **Response 2.** EPA agrees that the BOD, TSS and bacteria monitoring frequencies should not be increased over current requirements, given the facility's history of compliance with the permit limits, and therefore these have been reduced to 1/week in the Final Permit.
>
> The monitoring requirements for phosphorus and nitrogen are increased to allow more detailed assessment of receiving water loads and conditions and to provide a baseline and assessment data for the facility's nitrogen optimization efforts. This is consistent with EPA's approach to nutrient monitoring frequencies throughout the watershed. The monitoring frequency remains at 1/Week in the Final Permit.
>
> The monitoring frequency for aluminum has been reduced to 1/Month consistent with the lead and copper monitoring frequency and with aluminum monitoring frequency elsewhere in the watershed (see Middleborough WPCF Final Permit, NPDES No. MA0101591). EPA does not consider a 1/Month frequency to be "very extensive," particularly for new permit limits where the facility has historically discharged above the permit limit. Quarterly frequencies for metals limits is used by EPA for facilities that have a consistent history of compliance with their permit limits; that is not the case here. The monitoring frequency for metals is 1/Month in the Final Permit.

Comment 3. The effluent limits for copper, aluminum and lead are new to the permit and may not be achievable by current treatment or even with enhanced treatment units. We note that the Three Mile River just downstream of the Wheaton facility (and into which the Town of Mansfield WWTF discharges) has site-specific criteria for copper (18.1 ug/1 chronic and 25.7 ug/1 acute) as do many river segments in Massachusetts. This policy change was made in recognition of the lack of toxicity associated with the national copper criteria and resulted in stringent limits, which were unachievable and not necessary. We feel EPA should recognize this situation and apply the updated criteria when accessing the effluent limit for copper. The updated site-specific copper values were used in the recent Town of Mansfield draft NPDES permit. The aluminum limit is based upon a faulty criteria in many people's opinion and is currently being re-evaluated and will likely lead to a major change in the aluminum criteria. Other EPA regions and many states now use dissolved criteria and some have actually eliminated the criteria from their water quality standards after research showed that the total aluminum is not the proper way to control aluminum. We urge EPA to remove the aluminum limit until this situation is rectified in Massachusetts. We will regularly monitor for aluminum and

evaluate effluent toxicity with the WET testing. In addition, review of the data used in the reasonable potential analysis clearly show no levels near those calculated using the 95th percentile method. This is in our opinion not a rational approach to evaluate true potential discharge levels.

Response 3. EPA is aware that the limits for aluminum, copper and lead are new to the permit. Aluminum is added to the treatment process for phosphorus control and therefore is within the control of the facility to a large extent, so that EPA does not agree that the limit may not be achievable. The facility has discharged well below its TP limit at effluent aluminum concentrations close to and under the 305 ug/l permit limit. EPA agrees that the limits for copper and lead will likely require source assessment and/or modification to treatment processes to achieve. The Final Permit includes a two year compliance schedule for these limits in order to allow the facility time to modify its phosphorus treatment process (for aluminum) and assess sources and treatment processes (for copper and lead) to develop alternatives for meeting the permit limits.

The applicability of the site-specific criteria for copper is determined by MassDEP through amendment to its water quality standards; EPA does not have discretion to expand the applicable water bodies to include the Rumford River where MassDEP has not proposed such a change. In addition, the rationale for the site-specific criteria does not appear to apply in the Rumford River. The premise of the site-specific criteria is that organic substances within the water column have a mitigating effect on copper toxicity. Work originally completed in Connecticut established that where surface waters are high in organic content, specifically waters whose 7Q10 flow include a 20% or greater proportion of biologically treated domestic wastewater from a WWTF, copper toxicity was reduced and the copper criterion could be increased and still provide the same degree of aquatic life protection as the national guideline. Studies conducted by MassDEP in the Taunton River watershed confirmed these findings. The Rumford River, in contrast, is less than 10 percent effluent under 7Q10 conditions, and therefore will have less organic substances to mitigate toxicity. It is likely that this is the reason MassDEP has not adopted site-specific criteria for the Rumford River. Therefore, the copper limit remains the same in the Final Permit.

Similarly, the aluminum criterion used to calculate the limit in the draft permit is from EPA's *National Recommended Water Quality Criteria: 2002,* which have been adopted by MassDEP into its water quality standards (see 314 CMR 4.05(5)(e)). EPA is aware that there has been discussion of revisions to the aluminum criteria in Massachusetts, but MassDEP has not yet proposed any change in the aluminum criteria. EPA cannot wait for such a process to commence to set an effluent limitation for aluminum in light of EPA's obligation under the CWA to ensure attainment of state water quality standards. The Region's decision to move forward with an effluent limit for aluminum at this time is consistent with the CWA and EPA's regulations, which provide for the

reissuance of permits on a regular basis so that permit terms are revisited and reviewed rather than left unexamined and unchanged for long periods of time. *See* 33 USC §§ 1342(a)(3) and (b)(1)(B), and 40 C.F.R. § 122.46(a). Should there in the future be a change in the criteria, it can be incorporated into the permit in future terms subject to antidegradation and antibacksliding requirements, similar to those changes reflecting the site-specific copper criteria. Until such time as changes are adopted, however, EPA is mandated to use the criteria designated in the MA SWQS. Therefore, the aluminum limit remains the same in the Final Permit.

Finally, EPA disagrees with the contention that use of the 95th percentile (consistent with EPA, *Technical Support Document for Toxics Control*, 1991) is "not a rational approach", but in this case the permit limits would be included regardless of the method of calculating the upper bound effluent concentration.[1] For example, EPA's calculations indicate that any effluent aluminum concentration higher than 305 ug/l (the permit limit) would result in a violation of water quality standards under 7Q10 and design flow conditions; the range of actual effluent concentrations is 150 to 500 ug/l, with four out of eleven results over 305, so clearly there is reasonable potential to exceed that value. For copper all of the reported effluent concentrations are over the 7.6 ug/l value at which water quality violations are projected to occur; for lead two out of eleven values are higher than the 3.6 ug/l permit limit. EPA therefore reaffirms its reasonable potential analysis and all three permit limits are the same in the Final Permit.

Comment 4. We request that EPA reconsider the whole effluent toxicity (WET) testing requirements (2 species, twice per year and during the months of May and August). Based upon past test results, we feel that one species only should be required (C. daphnia is recommended as it is generally most sensitive).

Response 4. Wheaton College's current WET testing already represents a reduction from standard WET monitoring frequencies as set forth in MassDEP, *Massachusetts Water Quality Standards Implementation Policy for the Control of Toxic Pollutants in Surface Waters* (1990), which requires four samples per year, two species, with chronic and acute endpoints, for facilities with dilution factors between 10 and 20 (Wheaton's dilution factor is 17). While EPA has in a number of cases reduced the number of species tested where a facility consistently complies with permit limits, that is generally done where the frequency of testing remains at the standard frequency (here four per year). In the case of Wheaton College, a reduction in frequency rather than number of species is appropriate because the test results do not indicate that one species is consistently more

[1] EPA also notes that the permittee's statement that there are "no levels near those calculated using the 95th percentile method" is simply false; the values for copper (maximum reported value 38 ug/l; 95th percentile 40 ug/l) and lead (maximum reported value 5.7 ug/l; 95th percentile 5.9 ug/l) are quite close. Only aluminum has a significantly higher 95th percentile, and a permit limit is clearly required based on the actual monitoring results.

sensitive than the other. While the comment contends that C. daphnia should be used as the more sensitive species, both species have had relatively low chronic CNOEC results (though still meeting permit limits). The Fact Sheet Table 1 shows a daphnid CNOEC of 6.25% in May 2011; subsequent results include another 6.25% result in May 2013. For the minnow P. promelas the Fact Sheet showed CNOEC results of 25% in August 2011 and 12.5% in May 2012; subsequent results include CNOECs of 6.25% in August 2012 and May 2013.

As neither species can be characterized as consistently more sensitive, and WET requirements have already been reduced from standard requirements, the Final Permit continues the two species requirement.

Comment 5. The permit requires that a "nitrogen optimization" evaluation be conducted and a report submitted even though, as clearly stated in the fact sheet, the nitrogen loading (9 lbs/day) "is considered insignificant" in relationship to the WWTF loads in the Taunton River Watershed (approximately 1800 lbs/day) and the entire watershed load (over 4,228 lbs/day). This requirement should be removed from the draft permit as it will have no merit in the overall nitrogen reduction in the Taunton River watershed.

Response 5. In determining limits on TN in wastewater treatment plant permits in this watershed, EPA considered the relative significance of loading as the basis for selecting among the options of (1) establishing a numeric effluent limit that would be required to be met of the facility regardless of its current ability to meet that limit (i.e. requiring a substantial upgrade in most cases); and (2) requiring optimization of nitrogen removal so that the level of reduction to be achieved is consistent with the implementation of relatively low cost modifications or operational changes at existing facilities. By characterizing this distinction as one of "significance" EPA did not intend to imply that these discharges do not in fact contribute to the water quality violations, or that such optimization efforts are not meaningful in the context of the overall watershed. Rather, EPA has sought to provide the smaller facilities with a more flexible approach to nitrogen reduction than the setting of a permit limit. EPA is aware that achieving nitrogen reduction goals in this watershed will require nitrogen reduction efforts from all sources, including reductions from smaller sources.

Comment 6. We request that EPA consider removal of the inflow/infiltration (I/I) study requirement as the College actually does not have significant amounts of I/I (see flow data in Table 1). The College has done system evaluation, manhole lining and camera inspection of pipelines and feels the system is relatively low in I/I. The College will continue to be diligent in limiting extraneous flow as any such flow increases the total flow to the WWTF and results in the need for increased amounts of energy to provide treatment.

Response 6. EPA does not agree that the DMR data in Table 1 indicates the lack of significant amounts of I/I. Table 1 indicates multiple months where maximum daily flows are more than double the average flow, including daily maximums as

high as 0.13 mgd (compared to a long term average of 0.05 mgd). These data certainly could be indicative of significant I/I in the system, although as a system for an educational institution with periods of limited use (holidays when students are off campus) and intensive use (graduation weekends) there may be other explanations for the flow patterns revealed in Table 1.

Determination of the extent of I/I in the Wheaton College system therefore would require some assessment of the wet weather contribution to flows that is more detailed than can be done from DMR data. As the College did not provide any data beyond EPA's Table 1 (from the Fact Sheet), it appears that some additional analysis of flows should be performed in connection with the I/I requirements of the permit. The work the College has already performed in system evaluation, manhole lining and camera inspection will also be valuable in meeting the permit requirements.

Comment 7. The sludge testing requirements are unclear to us. The fact sheet does not properly describe how the sludge is processed. The current practice is for wet sludge to be taken away by a contractor and brought to their processing facility in Raynham, MA. We request clarification of what our testing and reporting requirements are under such sludge disposal practices.

Response 7. EPA notes the clarification of the facility's sludge processing. Where sludge is processes by a contractor the requirements are set forth in permit sections D.7 and D.8, as follows:

7. . . . If the permittee contracts with *another* "person who prepares sewage sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. . . .

8. . . . . If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:

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

Comment 8. The Net DMR requirements seem unclear as it states that all reports will be sent electronically but hard copies are still required to be sent to MassDEP (see page 12). Please clarify when and if hard copies are required.

Response 8. This is correct. All reports must be submitted electronically as attachments to the DMR using Net DMR. This electronic submittal satisfies the requirement for submittal to EPA. However hard copies are still required to be sent to MassDEP until further notice from MassDEP.