AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

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

Town of Southbridge

is authorized to discharge from the facility located at

83 Dresser Hill Road
Southbridge, MA

to receiving water named

Quinebaug River
(French and Quinebaug Watershed)

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

This permit shall become effective on December 1, 2006.

This permit and the authorization to discharge expire at midnight on November 30, 2011.

This permit supersedes the permit issued on April 14, 2000.

This permit consists of 13 pages in Part I including effluent limitations, monitoring requirements, Attachments A, B, C and D and 27 pages in Part II including General Conditions and Definitions.

Signed this 28th day of SEPTEMBER, 2006

/s/ SIGNATURE ON FILE

_____	_____
Director Office of Ecosystem Protection Environmental Protection Agency Boston, MA	Director Division of Watershed Management Department of Environmental Protection Commonwealth of Massachusetts Boston, MA

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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

Effluent Characteristic	Units	Effluent Limits			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[3]
Flow	MGD	3.77	----	Report	Continuous	Recorder
Flow[2]	MGD	Report	----	Report	Continuous	Recorder
BOD_5 [4]	mg/l	20	20	Report	2/Week	24-Hour Composite[5]
(November 1-March 31)	lbs/day	629	629	Report	2/Week	24-Hour Composite[5]
BOD_5 [4]	mg/l	10	10	Report	2/Week	24-Hour Composite[5]
(April 1-October 31)	lbs/day	315	315	Report	2/Week	24-Hour Composite[5]
TSS [4]	mg/l	20	20	Report	2/Week	24-Hour Composite[5]
(November 1-March 31)	lbs/day	629	629	Report	2/Week	24-Hour Composite[5]
TSS [4]	mg/l	13	13	Report	2/Week	24-Hour Composite[5]
(April 1-October 31)	lbs/day	409	409	Report	2/Week	24-Hour Composite[5]
pH		(See Condition I.A.1.b. on Page 6)			1/Day	Grab
Dissolved Oxygen	mg/l	6 mg/l minimum			1/Day	Grab
Fecal Coliform Bacteria[1,6] (April 1-October 31)	cfus/100 ml	200	----	400	2/Week	Grab
Total Residual Chlorine[6,7] (April 1 – October 31)	ug/l	35	----	60	1/Day	Grab

Effluent Characteristic	Units	Discharge Limitation			Monitoring Requirement	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[3]
Copper, Total[8]	ug/l	16	----	21	1/Month	24-Hour Composite[5]
Phosphorus, Total[9]	mg/l	0.2	----	Report	2/Week	24-Hour Composite[5]
(April 1-October 31)	lbs/day	Report		Report	2/Week	24-Hour Composite[5]
Phosphorus, Total	mg/l	1.0	----	1.5	2/Week	24-Hour Composite[5]
(November 1-March 31)	lbs/day	Report		Report	2/Week	24-Hour Composite[5]
Ortho Phosphorus, Dissolved	mg/l	Report	----	Report	2/Week	24-Hour Composite[5]
(November 1-March 31)[10]	lbs/day	Report		Report	2/Week	24-Hour Composite[5]
Aluminum, Total[11]	mg/l	0.28	----	----	1/Month	24-Hour Composite[5]
Total Ammonia Nitrogen, as N (April 1-April 30)	mg/l	10	Report	Report	2/Week	24-Hour Composite[5]
Total Ammonia Nitrogen, as N (May 1-May 31)	mg/l	5.0	5.0	8.0	2/Week	24-Hour Composite[5]
Total Ammonia Nitrogen, as N (June 1-October 31)	mg/l	1.3	1.3	2.0	2/Week	24-Hour Composite[5]
LC_{50}[13,15]	%	>/100			4/year[12]	24-Hour Composite[5]
Chronic NOEC[14,15]	%	>32			4/year[12]	24-Hour Composite[5]

All sampling shall be representative of the effluent that is discharged through outfall 001 to the Quinebaug River. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of every month. Any deviations from the routine sampling program shall be documented in correspondence appended to the applicable discharge monitoring report that is submitted to EPA.

Footnotes:

1. Required for State Certification.

2. This is an annual average limit, which shall be reported as a rolling average. The first value will be calculated using the monthly average influent flow for the first full month ending after the effective date of the permit and the eleven previous monthly average influent flows. Each subsequent month's DMR will report the annual average influent flow that is calculated from that month and the previous 11 months. The monthly average and maximum daily effluent flows for each month shall also be reported.

   The permittee shall attach monthly average data, the effluent flow entering the river and the flow diverted to Millenium Power Plant on the monthly discharge monitoring report

3. All required effluent samples shall be collected at the discharge point. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP. 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. All samples shall be 24 hour composites unless specified as a grab sample in 40 CFR §136.

4. Sampling required for influent and effluent. BOD_5 and TSS mass loadings shall be calculated using the flow quantities actually discharged to the receiving water (i.e. do not include flows treated but then sent to the Millennium Power Plant).

5. A 24-hour composite sample will consist of at least twenty four (24) flow proportional samples, taken during one working day. Working day is defined as a twenty-four hour period such as midnight on Monday through midnight on Tuesday the following day.

6. Fecal coliform and total residual chlorine effluent limits and monitoring are in effect April 1 through October 31. Fecal coliform discharges shall not exceed a monthly geometric mean of 200 colony forming units (cfu) per 100 ml, nor shall they exceed 400 cfu per 100 ml as a daily maximum. Fecal coliform samples shall be taken twice per week and conducted concurrently with TRC sampling described below.

   If chlorine is added to wastewater flow at any time during the period from November 1 through March 31, the effluent shall be sampled for TRC at the frequency required by the permit. The effluent limitation on TRC is year round.

7. The permittee shall collect at least one TRC grab sample per day. For every day that more than one grab sample is taken, the monthly DMR shall include an attachment documenting the individual grab sample results for that day, the date and time of each sample, the method used for analysis, and a summary of any operational modifications implemented in response to the sample results. All test results using EPA approved methods shall be used in the calculation and reporting of the monthly average and maximum daily data submitted on the DMR (see Part II. Section D.1.d.(2)).

8. The minimum detection level (ML) for copper is defined as 3.0 ug/l. This value is the minimum detection level for copper using the Furnace Atomic Absorption analytical method. For effluent limitations less than 3.0 ug/l, compliance/non-compliance will be determined based on the ML. Sample results of 3.0 ug/l or less shall be reported as zero on the discharge monitoring report.

9. The permittee shall comply with the total phosphorus monthly average limitation of 0.2 mg/l in accordance with the schedule contained in Section E of the permit. Section E also includes interim effluent limitations which shall be achieved pending compliance with the final permit.

10. The maximum daily concentration and loading values reported for dissolved orthophosphorus shall be values from the same day that the maximum daily total phosphorus concentration and loading values were measured.

11. The permitee shall comply with the monthly average total aluminum limitation of 0.28 mg/l in accordance with the schedule contained in Section E of the permit.

12. The permittee shall conduct chronic (and modified acute) toxicity tests four times per year. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee shall test the daphnid, Ceriodaphnia dubia, and the fathead minnow, Pimephales promelas. Toxicity test samples shall be collected during the second week of the months of February, May, August and November. The test results shall be submitted by the last day of the month following the completion of the test. The results are due March 31, June 30, September 30 and, December 31 respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

Test Dates Second Week in	**Submit Results By:**	**Test Species**	**Acute Limit LC_{50}**	**Chronic Limit C-NOEC**
February May August November	March 31 June 30 September 30 December 31	Ceriodaphnia dubia (daphnid) Pimephales promelas (fathead minnow)	>/100%	>32%

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 number of species used for 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.

13. 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.

14. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which

causes no adverse effect on growth, survival, or reproduction at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The "32% or greater" limit is defined as a sample which is composed of 32% (or greater) effluent, the remainder being dilution water. This is a maximum daily limit derived as a percentage of the inverse of the dilution factor of 3.17.

15. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall follow procedures outlined in **Attachment A Section IV., DILUTION WATER** in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required **in Attachment A**, EPA-New England has developed a Self-Implementing Alternative Dilution Water Guidance document (called "Guidance Document") which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. If this Guidance document is revoked, the permittee shall revert to obtaining approval as outlined in **Attachment A**. The "Guidance Document" has been sent to all permittees with their annual set of DMRs and Revised Updated Instructions for Completing EPA's Pre-Printed NPDES Discharge Monitoring Report (DMR) Form 3320-1 and is not intended as a direct attachment to this permit. Any modification or revocation to this "Guidance Document" will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

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 nor greater than 8.3 at any time.

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

d. The effluent shall contain neither a visible oil sheen, foam, nor 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 is required, when the average annual flow in any calendar year exceeds 80%of the facility's design flow, to submit a report to MassDEP on how the permittee will remain in compliance with the limitations in the permit, especially flow.

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

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

a. any new introduction of pollutants into that POTW from an indirect discharger in a primary industry category discharging process water; and

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

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

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

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

3. Prohibitions Concerning Interference and Pass-Through:

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

4. Toxics Control

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

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

5. Numerical Effluent Limitations for Toxicants

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

B. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall 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 in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting). [Note: SSO Reporting Form(which includes the MassDEP Regional Office telephone numbers) for submittal of a written report to MassDEP is available on-line at http://www.mass.gov/dep/water/approvals/surffms.htm#sso].

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 develop and implement a plan to control infiltration and inflow (I/I) to the separate sewer system. The plan shall be 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 implementation strategy schedule for addressing inflow sources in the River Street and Hillside Road areas of Town.

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 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. The Town shall eliminate sources of inflow identified on River Street and the Hillside area.

- 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 the MassDEP annually, **by the anniversary date of the effective date of this permit**. The report shall include a specific schedule for addressing sources of inflow on River Street and the Hillside Road area. The report shall also include corrective measures implemented on these inflow sources. 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, 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.

D. 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 §403.3).

E. SCHEDULE OF COMPLIANCE

No later than three years from the effective date of the permit, the permittee shall achieve compliance with the phosphorus limit of 0.2 mg/l between April 1 and October 31 and the monthly average aluminum limit of 0.28 mg/l. The limits shall be achieved in accordance with the following schedule:

1. Complete conceptual design of necessary upgrades no later than six months after the effective date of the permit.
2. Complete plans and specifications for necessary upgrades no later than 24 months after the effective date of the permit.
3. Complete construction of necessary upgrades and attain compliance with the final effluent limits for total phosphorus and total aluminum no later than 36 months after the effective date of the permit.

During the interim period, the permittee shall achieve an April 1 – October 31 monthly average total phosphorus limit of 1.0 mg/l and a maximum daily limit of 1.5 mg/l. Monitoring of the discharge shall be done in accordance with the requirements of Part I A.1. of the permit.

There shall be no interim limitations for total aluminum. Monitoring of the discharge shall be done in accordance with the requirements of Part I A.1. of the permit.

F. PRETREATMENT

1. Limitations for Industrial Users:

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

b. The permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users, as appropriate, which together with appropriate changes in the POTW Treatment Plant's Facility or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 90 days of the effective date of this permit, the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. As part of this evaluation, the permittee shall assess how the POTW performs with respect to influent and effluent of pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety and collection system concerns. In preparing this evaluation, the permittee shall complete and submit the attached form (Attachment B) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The Permittee shall carry out the local limits revisions in accordance with Local Limits Development Guidance (July 2004)

2. Industrial Pretreatment Program

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

(1) Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.

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

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

(4) Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

b. The permittee shall provide the EPA (and MassDEP) with an annual report describing the permittee's pretreatment program activities for the twelve month period ending 60 days prior to the due date in accordance with 403.12(i). The annual report shall be consistent with the format described in Attachment C of this permit and shall be submitted no later than May 1 of each year.

c. The permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 CFR 403.18(c).

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

G. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.

2. The permittee shall comply with the more stringent of either the state or federal (40 CFR Part 503), requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to facilities which perform one or more of the following use or disposal practices.

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

4. The 40 CFR Part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions also do not apply to facilities which do not 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 permittee shall use and comply with the attached compliance guidance document to determine appropriate conditions. See Attachment D. Appropriate conditions contain the following elements:

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

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

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction 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 than1500	1 /quarter
1500 to less than 15000	6 /year
15000 +	1 /month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR 503.8.

8. The permittee shall submit an annual report containing the information specified in the guidance by February 19. Reports shall be submitted to the address contained in the reporting section of the permit. Sludge monitoring is not required by the permittee when the permittee is not responsible for the ultimate sludge disposal. The permittee must be assured that any third party contractor is in compliance with appropriate regulatory requirements. In such case, the permittee is required only to submit an annual report by February 19 containing the following information:

* Name and address of contractor responsible for sludge disposal
* Quantity of sludge in dry metric tons removed from the facility by the sludge contractor

H. MONITORING AND REPORTING

1. Reporting

Monitoring results obtained during the previous month shall be summarized for each month and reported on separate Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the month following the effective date of the permit.

Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director and the State at the following addresses:

Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, Massachusetts 02114

The State Agency is:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

Signed and dated Discharge Monitoring Report Forms and toxicity test reports required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection
Division of Watershed Management
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

Signed and dated Industrial Pretreatment reports and Industrial User report revising local limits required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention - Industrial Wastewater Section
1 Winter Street
Boston, MA 02108

I STATE PERMIT CONDITIONS

This Discharge Permit is issued jointly by the U. S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) under Federal and State law, respectively. As such, all the terms and conditions of this Permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MassDEP pursuant to M.G.L. Chapter 21, §43.

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 an 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.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND
ONE CONGRESS STREET
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

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

NPDES PERMIT NO.: MA0100901

NAME AND ADDRESS OF APPLICANT:

Town of Southbridge
Department of Public Works
41 Elm Street
Southbridge, MA 01550

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Southbridge Wastewater Treatment Facility
83 Dresser Hill Road
Southbridge, MA 01550

RECEIVING WATER: **Quinebaug River (French & Quinebaug Watershed)**
CLASSIFICATION: **B**

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

The above named applicant has requested that the U.S. Environmental Protection Agency reissue its NPDES permit to discharge into the designated receiving water, the Quinebaug River. The facility is engaged in the collection and treatment of municipal and industrial wastewater.

The existing NPDES permit was issued on April 14, 2000 and expired on June 14, 2005. The applicant submitted a complete application for permit reisssuance, so the expired permit has been administratively extended and will be in effect until the new permit is issued. The draft permit has been written to reflect the current operation and conditions at the facility and authorizes a discharge from Outfall 001.

II. Description of Discharge

A quantitative description of the wastewater treatment plant's discharge in terms of significant effluent parameters, based on recent monitoring data, is shown in Table 1 of this fact sheet. Figure 1 of the fact sheet is a map showing the geographic location of the facility and Figure 2 is a diagram of the facility's flow process.

III. 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 Town of Southbridge operates a 3.77 million gallon per day (MGD) advanced wastewater treatment facility located in Southbridge, Massachusetts which serves approximately 16,500 people in Town of Southbridge, 200 people in the Town of Sturbridge and the Millennium Power Plant. There are six significant industrial users contributing wastewater to the plant. The collection system is 100 percent separate sanitary sewers. The Town has a contract with Veolia Water to manage the collection system and the treatment facility.

Wastewater enters the treatment facility through the headworks and flows through a mechanical bar screen, two aerated grit chambers and two comminutors. The wastewater then flows to two primary clarifiers followed by two biofilters. The pH of the biofilter effluent is adjusted and the wastewater is then treated through four activated sludge aeration tanks equipped with fine bubble diffusers and variable speed blowers. The discharge from the aeration tanks is dosed with alum to remove phosphorus in the final clarifiers. The clarified effluent is then measured through a Parshall flume flow meter and disinfected in the chlorine contact tanks prior to discharge. The effluent flows reported on the monthly monitoring reports are read from this meter. The chlorinated effluent is then either dechlorinated and discharged to the Quinegaug River or diverted to the Millenium Filter Building. The filtered effluent is pumped to the power plant where it is used for cooling water. The volume of effluent sent to the power plant varies daily but, is limited to 2.0 million gallons per day.

The facility has accepted up to 200,000 gallons per year of septage from residential septic systems in Southbridge and surrounding communities. The sepatge is discharged from holding tanks to the headworks of the facility. Sludge from the facility is composted at an on-site facility. The finished compost is marketed for use in landfill closures, were it is mixed with other soils for final cover. The compost is also sold to small vendors for fertilizer application.

POTW Discharges

Overview of Federal and State Regulations

General Requirements

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 Clean Water Act (see 40 CFR 125 Subpart A). For publicly owned treatment works, technology based requirements are effluent limitations based on secondary treatment as defined in 40 CFR Part 133.

EPA regulations require NPDES permits to contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to maintain or achieve federal or state water quality standards.

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 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 criterion 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, or attained.

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that caused, has reasonable potential to cause, or contribute to an excursion above any water quality criterion. An excursion occurs if the

projected or actual in stream concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and, where appropriate, the dilution of the effluent in the receiving water.

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirement of the CWA. EPA's anti-backsliding provisions, found in Section 402(o) and 303(d)(4) of the Clean Water Act and 40 CFR 122.44(l) prohibit the relaxation of permit limits, standards, and conditions except under certain specified conditions. All effluent limits, whether technology-based, water quality-based or based on state certification requirements are subject to anti-backsliding provisions.

Water body Classification and Usage
The Quinebaug River is classified as a Class B water body by the Massachusetts Department of Environmental Protection (MassDEP). Class B warm water fisheries are designated as habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated, they shall be suitable as a source of public water supply with appropriate treatment. They 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.

A warm water fishery is defined in the Massachusetts Surface Water Quality Standards (314 CMR 4.02) as water in which the maximum mean monthly temperature generally exceeds 20°Celsius during the summer months and is not capable of supporting a year-round population of cold water stenothermal aquatic life.

Flow
A flow limit of 3.77 MGD (5.84 cfs) is in the draft permit. It is the same as in the existing permit and is based on the design flow of the facility. The flow limit is now expressed as an annual average, rather than a monthly average as it is in the current permit. This change is being made in all POTW permits in Massachusetts at the request of MassDEP. The purpose of the change is to allow variation in POTW flows in response to wet weather events and in recognition that the flow rate used as the monthly average was presented as a long term average in the treatment plant's planning documents.

Discharge monitoring reports submitted for the period from January 2004 through August 2005 show that the monthly average flow limit was exceeded in April 2004 and April 2005. The monthly average flow recorded during this period varied from 2.15 MGD to 4.21MGD.

Available Dilution
A 7Q10 flow of 12.71 cfs and a dilution factor of 3.17 were used to calculate the effluent limits in the draft permit. Data from United States Geologic Survey (USGS) station number 01123600 was used to determine the 7Q10. The 7Q10 flow and the dilution factor are the same that were used in the existing permit.

7Q10 = 12.71 cfs

Treatment Plant Design flow is 3.77 MGD or 5.84 cfs

Dilution Factor
(12.71 + 5.84)/5.84 = 3.17

Biological Oxygen Demand ($BOD)_5$ and Total Suspended Solids (TSS)
BOD_5 and TSS concentration limits shall remain the same as in the existing permit. The limits are based on a waste load allocation performed by Massachusetts Department of Environmental Quality Engineering in 1981. The BOD_5 and TSS mass limits have increased slightly from the mass limits in the existing permit. The limits have been recalculated and the change corrects an error that was mistakenly carried over from what is in the existing permit

Calculation for maximum allowable load for average monthly and average weekly BOD_5 are based on the following equation.

Mass load, lbs/day = Design flow, MGD x Concentration, mg/l x 8.34

BOD_5 - 3.77 MGD x 20 mg/l x 8.34 = 429 lbs/day BOD -3.77 MGD x 10 mg/l x 8.34 = 315 lbs/day
TSS - 3.77 MGD x 20 mg/l x 8.34 = 429 lbs/day TSS – 3.77 MGD x 13 mg/l x 8.34 = 409

During the period from January 2004 through August 2005 the facility reported exceedances of the monthly average concentration limits for both BOD_5 and TSS in April 2004, March 2005 and April 2005.

Bacterial Limitations, **Dissolved Oxygen, and pH**
The numerical limitations for fecal coliform, dissolved oxygen (DO), and pH are based on state certification requirements under Section 401(a) (1) of the CWA, as described in 40 CFR 124.53 and 124.55, and will remain unchanged from the limits in the existing permit.

The seasonal sampling period for fecal coliform is from April through October. During the period from January 2004 through August 2005 there was one exceedance of fecal coliform limits, reported in August 2005. There were no reported exceedances of maximum or minimum pH limits, or the dissolved oxygen limit during the same time period.

Disinfection
Chlorine and chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. The effluent limits for monthly average and daily maximum Total Residual Chlorine (TRC) were developed using the chronic and acute criterion defined in the National Recommended Water Quality Criteria: 2002, as adopted by the MassDEP into the State Water Quality Standards. The criterion was multiplied by the available receiving water dilution for the appropriate flow scenario to obtain the TRC limit found in the draft permit. The criterion states that the average total residual chlorine in the receiving water should not exceed 11ug/l for chronic toxicity protection and, 19 ug/l for acute toxicity protection. Therefore, the dilution factor is multiplied by the acute criterion to obtain a maximum daily TRC limit, and the dilution factor is multiplied by the chronic criteria to obtain the monthly average TRC limit.

Chlorine calculation:
Acute chlorine water quality criteria is 19 ug/l.
Chronic chlorine water quality criteria is 11 ug/l.
Design flow dilution factor is 3.17

Average Monthly Total Residual Chlorine Limit = 3.17 x 0.011 mg/l = 0.0348 mg/l = 35 ug/l

Maximum Daily Total Residual Chlorine Limit = 3.17 x 0.019 mg/l = 0.060 mg/l = 60 ug/l

The draft permit requires the TRC be monitored once per day.

Liquid sodium hypochlorite is added to the effluent for disinfection before entering the chlorine contact chambers. Chlorine dosage is controlled by an on-line chlorine analyzer to meet a concentration of 1.75 to 2.5 mg/l sodium hypochlorite in the effluent. It is then dechlorinated with liquid sodium bisulfite prior to final discharge into the river. For the period from April 2004 through August 2005, the permittee reported exceedances for the monthly average and maximum daily TRC concentration in July 2005.

Metals

Certain metals in water may be toxic to aquatic life at low concentrations, so there is a need to limit the discharge of these metals where aquatic life may be impacted. EPA is required to limit any pollutant or pollutant parameter that is or may be discharged at a level that caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion. The draft permit has effluent limits for copper and aluminum.

Copper Limits

The EPA- recommended approach to set and measure compliance with water quality standards is to use dissolved metals rather than total recoverable metals. Dissolved metals more closely approximate the bioavailable fraction of metal in the water column than total recoverable metal. Most toxicity to aquatic organisms is by adsorption or uptake across the gills which would require the metal to be in dissolved form. When toxicity tests were originally conducted to develop EPA's Section 304(a) metals criteria, the concentrations were expressed as total, and subsequent testing on some metals, including copper, determined the percent of the total metals that is dissolved. The calculations that follow use the freshwater copper conversion factor to calculate the dissolved acute and chronic water quality criteria for copper.

Section 40 CFR 122.45(c) requires that the permit limits be based on total recoverable metals and not dissolved metals. The chemical differences between the effluent and the receiving water may cause changes in the partitioning between dissolved and particulate forms of copper. As the effluent mixes with the receiving water, adsorbed copper from the discharge may dissolve in the water column. In this case, measuring dissolved copper would underestimate the impact on the receiving water, and an additional calculation, using a site-specific translator would determine total metal criteria. Based on EPA's *Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (EPA-823-B-96-007), the conversion factor is equivalent to the translator if site-specific studies have not been conducted. The total recoverable effluent limit has been determined by dividing the dissolved criteria by the conversion factor in lieu of a translator.

EPA's Office of Water - Office of Science and Technology stated in a letter dated July 7, 2000 that: *The hardness of the water containing the discharged toxic metal should be used for determining the applicable criterion. Thus, the downstream hardness should be used.* The hardness of the Quinebaug River downstream of the plant's discharge was calculated based on the ambient and effluent hardness data submitted in the whole effluent toxicity tests.

In order to determine the hardness downstream of the treatment plant during the critical low flow periods, the ambient and effluent hardness values from the whole effluent toxicity tests conducted from April 2004 to May 2005 were calculated using the following mass balance equations:

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

Where:

Q_d = Discharge flow from plant, 3.77 MGD (5.84 cfs)

Q_s = 7Q10 river flow upstream of plant, 12.71cfs
Q_r = Combined river flow (7Q10 + plant flow), 18.55
C_s = Upstream hardness concentration
C_d = Plant discharge hardness concentration
C_r = Receiving water hardness concentration

WET Test Date	Effluent Hardness, mg/l	Ambient Hardness, mg/l	Calculated Downstream Hardness, mg/l
April 2004	130	21	55
May 2004	190	25	77
August 2004	180	33	79
November 2004	120	28	57
January 2005	100	19	45
February 2005	97	25	48
April 2005	100	20	45
May 2005	200	25	80

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r} = \frac{(5.84 \text{ cfs})(100 \text{mg/l}) + (12.71 \text{cfs})(19 \text{ mg/l})}{18.6} = 44.50 \text{ mg/l}$$

The lowest downstream hardness from the above table, 45 mg/l, was selected to determine the permit limits, as this would be the most protective of aquatic life. Generally, as the hardness in the stream increases the toxicity to aquatic life decreases.

Water Quality Criteria for hardness-dependent metals (see equations below):

Acute criteria (dissolved) = $\exp\{m_a [\ln (\text{hardness})] + b_a\}$ (CF)

Where: m_a = pollutant-specific coefficient = 0.9422
b_a = pollutant-specific coefficient = -1.700
h = hardness of the receiving water = 45 mg/l as $CaCO_3$
ln = natural logarithm
CF = pollutant specific conversion factor used to convert total recoverable to dissolved metal = 0.96

CMC = Acute copper criteria (dissolved) = $\exp\{0.9422[\ln(45)] - 1.700\}$ (0.96) = 6.33 ug/l

Maximum Daily Effluent limitation:
(CMC) (dilution factor) = (6.33 ug/l) (3.17) = 20.07 ug/l (dissolved)
Maximum Daily limit = 20.07 ug/l / 0.96 = 20.91 ug/l (total recoverable)

Chronic criteria (dissolved) = $\exp\{m_c [\ln (\text{hardness})] + b_c\}$ (CF)

Where: m_c = pollutant-specific coefficient = 0.8545
b_c = pollutant-specifc coefficient = - 1.702
h = hardness of the receiving water = 45 mg/l as $CaCO_3$
ln = natural logarithm

CF = pollutant specific conversion factor used to convert total recoverable to dissolved metal = 0.96

CCC = Chronic copper criteria (dissolved) = exp{0.8545 [ln(45)] - 1.702} (0.96) = 4.53 ug/l

Average Monthly Effluent limitation:
(CCC)(dilution factor) = (4.53)(3.17) = 14.97 ug/l (dissolved)
Average Monthly limit = 14.97/ 0.96 = 15.59 ug/l (total recoverable)

The draft permit includes average monthly and maximum daily limits of 16 ug/l and 21 ug/l for total recoverable copper. The copper limits sampling frequency of once per month will remain unchanged from the existing permit. For the period of January 2004 through December 2005, the monthly average concentration of copper in the effluent was between 4.0 ug/l and 40.0 ug/l.

The draft copper limits are based on a higher hardness level than the hardness level used in the previous permit, consequently, the limits are less stringent than the ones in the existing permit. EPA and MassDEP believe that the recalculated limits achieve water quality standards, and are consistent with antidegradation requirements.

The permit specifies the method of analysis and method reporting limit because levels of copper reported on the facility's discharge monitoring reports have been as low as 4.0 ug/l. As stated in footnote 8 of the draft permit, for reporting purposes, the permittee may report zero on the DMRs for sampling results less than 3.0 ug/l.

The facility is under EPA Administrative Order Docket No. 03-06, signed February 28, 2003, for the violations of the copper limit in the current permit. The order sets an interim limit of 20 ug/l, and requires annual reporting of progress on identifying sources of copper in the wastewater entering the facility and available treatment options.

MassDEP is currently developing site-specific criteria for copper. If these criteria would result in higher limits, the permit may be reopened for modification.

Aluminum
A monthly average aluminum limit of 0.28 mg/l has been added to the draft permit. As shown in the table below, effluent data reported in recent toxicity tests indicate there is a reasonable potential for aluminum levels in the effluent to exceed water quality criteria. The chronic criterion for aluminum is 0.087 mg/l as published in the National Recommended Water Quality Criteria: 2002. The chronic criterion is multiplied by the available dilution in the receiving water to arrive at the monthly average limit.

Chronic aluminum level 87 ug/l x 3.17 = 275.79 ug/l = 0.275 mg/l

The facility adds aluminum sulfate to the effluent for phosphorus removal after the aeration tanks and polyaluminum chloride (PAC) after the aerated grit chamber for copper removal.

Toxicity Test Date	Aluminum levels in the receiving stream, upstream from discharge	Aluminum results in the effluent
January 2005	0.15 mg/l	0.26 mg/l
February 2005	0.07 mg/l	0.12 mg/l
April 2005	0.19 mg/l	0.14 mg/l
May 2005	<0.01 mg/l	0.98 mg/l
November 2005	0.089 mg/l	0.28 mg/l

Ammonia
Ammonia can reduce the receiving stream dissolved oxygen concentration through nitrification and can be toxic at elevated levels. The ammonia effluent limits were derived from the waste load allocation prepared for the facility by MassDEP in 1980. The effluent limitations for ammonia-nitrogen in the current permit are in effect from April1 through October 31 each year and will remain the same in the draft permit. The discharge monitoring data submitted for the period from April 2004 through September 2005 show that total ammonia levels in the final effluent were within the permit limits.

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

In December 2000, EPA released "Ecoregional Nutrient Criteria", (USEPA 2000) established as part of an effort to reduce problems associated with excess nutrients in water in specific areas of the country. The published criteria represent conditions in waters in ecoregions that are minimally impacted by human activities, and thus representative of water without cultural eutrophication. Southbridge is within Ecoregion XIV, Eastern Coastal Plains. The total phosphorus criteria for this ecoregion, found in Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV is 24 ug/l (0.024 mg/l).

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

The Massachusetts Surface Water Quality Standards (314 CMR 4.00) do not contain numerical criteria for total phosphorus (TP). The criteria for nutrients are found at 314 CMR 4.05(5)(c), which states that nutrients "shall not exceed the site specific limits necessary to control accelerated or cultural eutrophication". The Water Quality Standards also require that "any existing point source discharges containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients (314 CMR 4.04). MassDEP has established that a monthly average total phosphorus limit of 0.2 mg/l represents highest and best practical treatment for POTWs.

Eutrophication and the Quinebaug River
The Southbridge WWTP discharges to segment MA41-03 of the Quinebaug River. Downstream of the treatment plant there is evidence of eutrophication in the river. The 2001 Water Quality Assessment Report published by MassDEP refers to data collected by a survey completed by the United States Geological Survey (USGS) for total phosphorous levels, downstream from the treatment plant's discharge in segment MA41-04 of the Quinebaug River. The data collected ranged was between 0.009 mg/l and

0.184 mg/l. See the French and Quinebaug River Watersheds 2001 Water Quality Assessment Report page 109.

The 2002 Massachusetts Integrated List of Waters in Massachusetts lists segment MA41-03 of the Quinebaug River as being impaired or threatened for one or more uses for nutrients, and organic enrichment/low dissolved oxygen. The MassDEP is required to calculate a Total Maximum Daily Load (TMDL) for this segment of the River.

Phosphorous permit limits

The monthly average and maximum daily total phosphorous limits in the existing permit are 1 mg/l and 1.5 mg/l. These limits are seasonal and extend from April through October each year. Effluent sampling results for monthly average total phosphorous (TP) concentration submitted on the discharge monitoring reports for the period between April 2004 and October 2005 were between 0.2 mg/l to 1.2 mg/l, and effluent results for the maximum daily TP for the same time period were between 0.3 mg/l and 3.2 mg/l.

In order to determine if the existing limits are sufficiently stringent to be protective of water quality standards, EPA estimated the receiving water phosphorous concentration that would result from the discharge of phosphorus at the permitted design flow under 7Q10 conditions. This can be done by dividing the effluent limitation (1 mg/l) by the dilution factor (3.17), which results is an estimated instream concentration of 0.32 mg/l, which is well above any of the recommended instream phosphorus concentrations The reported levels exceed the recommended criteria in the Gold Book, the Ecoregional Nutrient Criteria and the New England-wide total phosphorus concentrations published by the EPA. In order to for the discharge to achieve even the least stringent guidance value of 0.1 mg/l (Gold Book), the effluent concentration would have to be 0.32 mg/l, but this analysis assumes that the background concentration of phosphorous in the receiving water is 0 mg/l, which is not the case.

Therefore, the draft permit include a seasonal monthly average limit of 0.2 mg/l, based on the highest and best practical treatment for POTWs as established by MassDEP. At this concentration, under 7Q10 and design flow conditions, the instream phosphorus concentration resulting from this discharge would be about 0.06 mg/l, which would be within the Gold Book recommended criteria. This limit shall be effective during the warm weather months (April 1 through October 31) when eutrophication typically occurs. A monthly average limit of 1.0 mg/l is included for November 1 through March 31 to ensure that higher levels of phosphorous discharged during the cold weather months do not result in an accumulation of phosphorous in the sediment and subsequent release during the warm weather growing season.

In the future when MassDEP adopts nutrient criteria, the required TMDL is completed, or additional water quality information shows that the phosphorus limit is not stringent enough to meet water quality standards, a more stringent limit may be imposed.

Whole Effluent Toxicity Testing

Under Section 301(b)(1) of the CWA, discharges are subject to effluent limitations based on water quality standards. The State Surface Water Quality Standards (314 CMR 4.05(5)(e.)), include the following narrative statements and require that EPA criteria established pursuant to Section 304(a)(l) of the CWA be used as guidance for 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. Where the State determines that a specific pollutant not otherwise listed in 3.14 CMR 4.00 could reasonably be expected to adversely affect existing or designated uses, the State shall use the recommended limit published by EPA pursuant to 33 U.S.C. 1251 §304(a) as the allowable receiving water concentrations for the affected waters unless a site-specific limit is established. Site

specific limits, human health risk levels and permit limits will be established in accordance with 314 CMR 4.05(5)(e)(1)(2)(3)(4).

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents to POTWs above those, which may be contributed from industrial users. These pollutants include metals, chlorinated solvents, aromatic hydrocarbons and other constituents.

As a result, EPA-New England and MassDEP have developed toxicity control policies. These policies require wastewater treatment facilities to perform toxicity bioassays on their effluent. Discharges having a dilution of less than 10:1 require acute and chronic toxicity limits and testing four times per year.

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 analysis; (2) bioavailability of pollutants after discharge is measured by toxicity testing including any synergistic effect of pollutants; and (3) pollutants for which there are inadequate analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in connection with pollutant-specific control procedures to control the discharge of toxic pollutants.

The Chronic-No Observed Effect Concentration (C-NOEC) limitation in the draft permit prohibits chronic adverse effects (e.g., on survival, growth, or reproduction) when aquatic organisms are exposed to the POTW discharge at the calculated available dilution.

The existing permit required six toxicity tests per year and specified that two tests be conducted during a high flow event. A high flow event was defined as a flow of 4 MGD or greater measured prior to the volume used by Millennium Power Plant. A review of toxicity test results for high flow events from February 2002 through April 2005 showed acute toxicity in the April 2005 test for daphnid, (Ceriodaphnia dubia). As shown in the tables below the test results do not indicate that there is a direct link between a high flow event and toxicity from the effluent (the months with an asterisk indicates a toxicity test conducted during a high flow event). The high flow event WET sampling requirements have therefore been removed from the draft permit.

This draft permit requires four toxicity tests per year for daphnid, (Ceriodaphnia dubia) and fathead minnows, (Pimephales promelas). Tests are to be conducted the second week in February, May, August and, November using the protocol in Attachment A of the draft permit. The results from several toxicity tests have shown signs of chronic toxicity over the last several years for both the daphnia and the fathead minnow.

Acute Toxicity Tests Results

Date	LC50– Acute Ceriodaphnia	LC50–Acute Pimephales	NOEC-Acute Ceriodaphnia	NOEC– Acute Pimphales
February 2002	100%	100%	100%	100%
March 2002*	100%	100%	100%	100%
May 2002	100%	100%	100%	100%
August 2002	100%	100%	100%	100%
November 2002*	100%	100%	100%	100%
February 2003	100%	100%	100%	100%
February 2003*	100%	100%	100%	100%
May 2003	100%	100%	100%	100%
June 2003*	100%	100%	100%	100%
August 2003	100%	100%	100%	100%

November 2003	100%	100%	100%	100%
February 2004	100%	100%	100%	100%
May 2004	100%	100%	100%	100%
April 2004*	100%	100%	100%	100%
August 2004	100%	100%	100%	100%
November 2004	100%	100%	100%	100%
January 2005*	100%	100%	100%	100%
February 2005	100%	100%	100%	100%
April 2005*	36.7%	100%	31%	100%
May 2005	100%	100%	100%	100%
August 2005	100%	100%	100%	100%

Chronic Toxicity Test Results

Date	C-NOEC Ceriodaphnia	C-NOEC Pimphales	LOEC Ceriodaphnia	LOEC Pimphales
February 2002	100%	100%	100%	6.25%
March 2002*	100%	100%	100%	100%
May 2002	100%	100%	100%	100%
August 2002	25%	12.5%	31%	25%
November 2002*	100%	100%	100%	100%
February 2003	25%	100%	31%	100%
February 2003*	100%	100%	100%	100%
May 2003	100%	100%	100%	100%
June 2003*	100%	100%	100%	100%
August 2003	12.5%	100%	25%	100%
November 2003	100%	25%	100%	31%
February 2004	100%	100%	100%	100%
May 2004	100%	100%	100%	100%
April 2004*	100%	100%	100%	100%
August 2004	50%	100%	100%	100%
November 2004	100%	12.5%	100%	25%
January 2005*	100%	100%	100%	100%
February 2005	100%	100%	100%	100%
April 2005*	31%	100%	50%	100%
May 2005	100%	100%	100%	100%
August 2005	100%	100%	100%	100%

V. Sludge Information and Requirements

The WWTP sludge is dewatered with a belt press, polymer is added as a dewatering aid and sodium chlorite (an oxidant) added for odor control. The de-watered sludge is then mixed with wood ash for long-term odor control and sawdust for a source of carbon for bacterial growth. The final mixture is composted. This compost is marketed for use in landfill closures, where it is mixed with other soils for final cover. The compost is also sold to small vendors for fertilizer application.

Section 405(d) of the Clean Water Act requires that sludge conditions be included in all POTW permits. The sludge conditions in the draft permit satisfy this requirement and are taken from EPA's Standard for the disposal of sewage sludge (40 CFR 503). Attachment D of the fact sheet is the Sludge Compliance Guidance and provides guidance on sewage sludge use and disposal practices.

VI. Pretreatment

The Southbridge WWTP has six significant industrial users. The SIUs include three optical companies, two metal products manufacturers, and one precious metal plater. There are local limits for cyanide and eleven metals: Ag, Al, Ba, Cd, Cr, Cu, Fe, Pb, Ni, Sn, and Zn.

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR Part 403 and Section 307 of the Act. The Permittee's pretreatment program received EPA approval on May 15, 1985 and, as a result, appropriate pretreatment program requirements were incorporated into previous permits which were consistent with that approval and Federal Pretreatment Regulations in effect when the permit was issued.

In October 1988 and July 1990, the Federal Pretreatment Regulations at 40 CFR 403 were amended. Those amendments established new requirements for implementation of pretreatment programs. In previous permits the permittee was required to modify its pretreatment program to be consistent with these regulations.

The draft permit requires the permittee to prepare a written technical evaluation of its pretreatment program within 90 days of the effective date of the permit to ensure that the pretreatment program is consistent with the requirements of the new permit (e.g. any new effluent limitations) and up-to-date with all pretreatment requirements currently in effect. The following components of the pretreatment program are to be evaluated: (1) development and enforcement of EPA-approved specific effluent limits (technically-based local limits); (2) revision of the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; (3) development of an enforcement response plan; (4) implementation of a slug control evaluation program; (5) tracking significant noncompliance for industrial users; and (6) establishing a definition for, and tracking the status of, significant industrial users. The form included as Attachment B to the draft permit must be completed as a component of this review. These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

The draft permit also requires the permittee to continue to submit, annually on May 1, a pretreatment report detailing the activities of the program for the twelve-month period ending 60 days prior to the due date. Attachment C of the draft permit describes the information that shall be included in the Industrial Pretreatment Program Annual Report.

VII. Essential Fish Habitat (EFH)

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

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

A review of the relevant essential fish habitat information provided by NMFS indicated that Essential Fish Habitat does not exist in the vicinity of the proposed discharge.

EPA has determined that a formal EFH consultation with NMFS is not required because the proposed discharge will not adversely impact EFH.

VIII. State Certification Requirements

The staff of the State Water Pollution Control Agency has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR.124.53 and expects that the draft permit will be certified.

IX. Public Comment Period, and Procedures for Final Decision

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to U.S.EPA, Massachusetts Office of Ecosystem Protection (CMP), One Congress Street- Suite 1100, Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

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

X. EPA and MassDEP Contacts

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

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US Environmental Protection Agency
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U.S. Environmental Protection Agency

Date:

Attachment A of the Fact Sheet
Southbridge Wastewater Treatment Plant
Summary of NPDES Permit Reporting Requirements Dates

Permit Page	Requirement and Dates	Submit to:
5	Whole Effluent Toxicity Tests results are due February 28, May 31, August 31 and November 30.	EPA/MassDEP
8	The permittee shall develop and implement a plan to control I/I to the separate sewer system. The plan shall be submitted to EPA and MassDEP within six months of the effective date of the permit. See Part 1.C.3.	MassDEP
8	A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and the MassDEP annually by the permittee by the anniversary date of the effective date of the permit	EPA/MassDEP
9	The permittee shall submit a written technical evaluation analyzing the need to revise local limits 90 days after the final permit becomes effective.	EPA
10	The permittee shall prepare an annual report, May 1 describing the permittee's pretreatment activities which is consistent with Attachment C of the permit.	EPA/MassDEP
11	The permittee shall submit an annual report containing the information specified in the sludge section of the permit by February 19.	EPA/MassDEP
11	Monitoring results obtained during the previous month shall be summarized for each month and reported on separate Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the month following the effective date of the permit.	EPA/MassDEP

Table 1. Discharge Monitoring Data Summary
Southbridge WWTP

DMR data for the period between January 2004 and December 2005

Parameter	Range of Results
Monthly Average Flow, MGD	2.02 – 4.14
Monthly Average BOD_5, mg/l	3.0 - 14.0
Monthly Average TSS, mg/l	5.0 – 22.0
pH, S.U,	6.5 – 8.2
Average monthly fecal coliform, cfu's	2.0 – 21.0
Total Residual Chlorine, mg/l	0
Dissolved Oxygen, mg/l	6.0 – 9.4
Total Ammonia Nitrogen, as N	0.2 – 4.1
Total Phosphorus, mg/l	0.2 – 1.0
Copper, ug/l	4.0 – 40.0

RESPONSE TO PUBLIC COMMENT

From April 4, 2006 to May 3, 2006, the United States Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) solicited Public Comments on a draft NPDES permit. The draft permit was developed pursuant to a reapplication from the Town of Southbridge for reissuance of the Town's NPDES permit to discharge wastewater to the Quinebaug River. After a review of the comments received, EPA has made a final decision to issue the permit authorizing the discharge. The following response to comment describes the changes and briefly describes and responds to the comments on the draft permit. A copy of the final permit may be obtained by writing or calling Betsy Davis, United States Environmental Protection Agency, 1 Congress Street, Suite 1100 (CMA), Boston, Massachusetts 02114-2023; Telephone (617) 918-1576.

Comments submitted by Hamer Clarke, Director of Public Works, Town of Southbridge, MA on May 3, 2006.

Comment #1 Page 1 of the draft permit incorrectly lists the facility address as 83 Dresser Road. The correct address is 83 Dresser Hill Road.

Response: This correction has been made.

Comment #2 The seasonal (April 1 – October 31) total phosphorus limit has decreased from 1.0 mg/L to 0.2 mg/L for a monthly average. There is a 2-year compliance schedule to meet this limit. The current wastewater treatment facility (WWTF) cannot meet this limit without significant process modifications at excessive and unforeseeable cost to the town. A WWTF upgrade is scheduled to start construction in 2006 and is not intended to provide means for the WWTF to meet a phosphorus limit less than the current 1.0 mg/l limit. This limit cannot be met within the suggested two-year time frame.

At a minimum, the EPA should allow one complete permit cycle (5 years) to comply with the phosphorus limits, which will allow the town to pilot test alternative chemicals and unit processes for phosphorus removal.

The new phosphorus limit is an arbitrary application of the State's formulaic standards for Highest and Best Practical Treatment. Based on information contained within the EPA Fact Sheet, this limit was arrived at based solely on estimated phosphorus levels within the receiving waters. Actual phosphorous levels will provide a better and more accurate means of establishing appropriate limits. It is neither difficult nor unreasonable to seek and obtain actual levels. The phosphorus limit should not be changed until a TMDL study is complete, which would provide a factual basis for the phosphorus limit imposed on the WWTF. Once the required phosphorus limit is known, the Town must be given sufficient time to design and implement new unit processes specifically designed for phosphorus reduction. The time necessary for this process would be determined once the required phosphorus limit is determined.

Based on the above discussion, the Town believes that EPA's conclusions fail to adhere to accepted standards and are otherwise arbitrary and capricious. Without

applicable factual support, the EPA should not implement more stringent permit terms.

Response: The compliance schedule in the final permit has been extended to three years. It provides additional time for the Town to upgrade the treatment plant to meet the lower phosphorus limits.

The data provided in the fact sheet are not estimated levels of phosphorus in the Quinebaug River but, are the result of samples collected by the USGS as reported in the French and Quinebaug River Watershed 2001 Water Quality Assessment Report prepared by the Massachusetts Department of Environmental Protection (MassDEP). The report provides evidence of eutrophication in the Quinebaug River downstream of the treatment plant. Data on instream phosphorus indicates levels are as high as 0.184 mg/l. The French and Quinebaug River Watersheds 2001Water Quality Assessment Report concluded only partial support for designated uses in the segment of the River downstream from the discharge. The report cited known causes of impairment as organic enrichment, and low dissolved oxygen data which are indicative of high levels of nutrients in the water.

Massachusetts Water Quality Standards, 314 CMR 4.04(5) require,"any existing point source discharge containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practical treatment to remove such nutrients." MassDEP has established the highest and best practicable treatment to be 0.2 mg/l. The limit can not be any lower than 0.2 mg/l and meet water quality standards as documented in the fact sheet. It is MassDEP and EPA's responsibility to establish permit limits using the best information available that will achieve water quality standards with an appropriate margin of safety. Once the results from the TMDL study are available the permit limits may change based on the information from the study.

The River downstream of treatment plant's discharge is listed as impaired for nutrients and other pollutants on the 2004 Integrated Lists of Waters and the draft 2006 Massachusetts Integrated Lists of Waters published by MassDEP. The State requires that a TMDL for nutrients be completed for this segment of the River After a TMDL has been completed the permit limits will be reviewed and adjusted to reflect data from the study. However, it is EPA's understanding that a TMDL has not been scheduled for this river segment.

Comment #3 A seasonal (November 1 – March 31) total phosphorus limit is a new requirement, which now requires the facility to remove phosphorus year round. The draft limits are 1.0 mg/l for a monthly average and 1.5 mg/l maximum daily for the winter season. No basis for this limit is provided in the EPA Fact Sheet. A winter limit should only be imposed if its necessity is based on a TMDL study for the receiving waters.

The Town believes that the lack of applicable factual support renders the draft permit terms arbitrary and capricious. Should the EPA seek to implement more stringent criteria it should base its analysis on a proper TMDL after which the permit can be rewritten to achieve the objectives of the TMDL. Until that time, the draft permit lacks the necessary factual support.

Response: The Agencies have included a winter phosphorus limit in order to prevent phosphorus levels from accumulating in the sediment and being released during the warm weather growing season. See Fact Sheet discussion.

Comment #4 As discussed later in this document, the draft permit will include a new aluminum limit. Given that Alum is utilized at the WWTF for phosphorus removal, limiting aluminum in the effluent will adversely affect efforts to reach and maintain the phosphorus discharge limits. To reach the lower phosphorus levels, additional Alum will be required based on current plant operations. Therefore, the aluminum levels in the effluent will increase. Under current operations, the WWTF cannot meet the proposed aluminum limits. On page 7 of the Fact Sheet, Aluminum, the toxicity test results table identifies that documented aluminum results in the effluent are at or above the proposed limit of 0.28 mg/l. It appears inevitable that Alum would have to be replaced by another chemical and would have to be pilot tested. This will take time and it is requested that the compliance schedule reflect as such.

The Town believes that, at a minimum, the EPA should allow one complete permit cycle (5 years) to comply with the new winter phosphorus limits which will allow the town to pilot test alternative chemicals and unit processes for phosphorus removal other than Alum. As previously stated, a proper TMDL should also be conducted to determine actual phosphorus levels. It is possible that the TMDL will demonstrate that current levels are adequate and no further Alum will be necessary. Until the TMDL has been completed, the Town believes that draft permit lacks the necessary factual support for imposing stricter Aluminum limits.

Response: The final permit includes a compliance schedule of three years for the permittee to meet the monthly average aluminum limit.

EPA is required to establish permit limits that satisfy the technology and water quality requirements of the federal Clean Water Act. In establishing such limits, EPA is not authorized to consider whether or not the permittee can comply with them. The segment downstream of the discharge does not fully meet designated uses for aquatic life. This is documented in the 2001 water quality assessment report issued by MassDEP and is available for review at http://www.mass.gov/dep/water/resources/wqassess.htm.

Therefore, pursuant to 40 CFR 122.44(d) (iii), the permit must contain effluent limits for a pollutant that causes, has a reasonable potential to cause or contribute to an in-stream excursion above the allowable ambient concentration of a State numeric criteria.

The aluminum levels upstream of the discharge are lower than levels in the effluent and data presented in the fact sheet establishes there is a reasonable potential for aluminum levels in the effluent to exceed aluminum water quality criteria. The chronic criterion is 0.087 mg/l as published in the National Recommended Water Quality Criteria: 2002. The chronic criterion is multiplied by the available dilution in the receiving water to arrive at the monthly average limit as shown in the fact sheet.

Monthly average and maximum daily phosphorus limits from November 1 through March 31 are in the final permit. These limits have been added to the final permit to prevent the accumulation of phosphorus in the sediment during the colder months and subsequent release between April and October.

A phosphorus limit of 1.0 mg/l is in the final permit for the months of November 1 through March 31. A one year compliance schedule has been added to the final permit for the permittee to meet this limit. The winter limit can be reached through chemical addition that will not require extensive plant upgrades that may be necessary to meet the more stringent warm weather limit. The one year compliance schedule will provide the permittee time to experiment with chemical dosing and the three year compliance schedule will provide time for more extensive plant upgrades.

Comment #5 The draft permit contains an aluminum limit of 0.28 mg/l, which is a new requirement. It appears that this limit is based on one year of test data. The Town requests that the EPA remove this limit or add a compliance schedule to meet the aluminum limit. The compliance schedule for aluminum should go hand-in-hand with the phosphorus limit. The impact of year-round phosphorus removal and the performance of the plant upgrade are unknown at this time. It would be imprudent to set a permit limit before the facility upgrade is completed and the actual facility performance is quantified. If filtration is required for phosphorus removal this may also reduce the levels of aluminum in the plant effluent but all this is unknown at this time.

By implementing an aluminum limit and a more stringent phosphorus limit, the facility is being subject to a "double jeopardy" permit. With the current facility, if the effluent phosphorus is too high, the only reasonable option is to add more alum to reduce phosphorus, which will subject the facility to non-compliance for aluminum discharge.

Based on the above discussion, the Town believes that the permit should be written with Aluminum limits as a monitor only parameter and that DEP should conduct a proper TMDL on this system, after which the permit can be rewritten to achieve the objectives of the TMDL. Otherwise, the town will be forced to make decisions about treatment plant upgrade investments, which would be subject to revision almost within the time frame of their implementation, which runs the risk of wasting time and money, with no tangible enhancement to plant performance.

Response: See Response to Comment # 4.

Comment #6 Footnote 2 requires that flow to the river and flow to Millennium Power Plant (MPP) be recorded and reported. There is no allowance to deduct the MPP flow from the plant effluent discharged to the river. "Accurate" effluent discharges to the river for flow and concentration are not realized without this allowance. It is requested that EPA include an allowance to deduct the MPP flow from the plant discharge flow for the purpose of flow and concentration calculations for NPDES permit reporting. Without inclusion of such allowance the plant would be

unfairly or arbitrarily penalized for flow & concentrations that do not enter the river but are required to be reported as such.

Based on the above discussion, the Town believes that EPA's conclusions are factually incorrect, and that the permit should be written based on the actual accurate effluent discharges to the river. There can be little doubt that basing substantially more stringent permit terms on inaccurate data fails to conform to acceptable standards and is otherwise arbitrary and capricious.

Response: The final permit includes a reporting requirement for flow going to the Millennium Power Plant (MPP) and, the effluent discharged to the River. The annual average flow calculated for compliance purposes shall be based on the flow coming into the treatment plant. Footnote 2 on page 4 of the final permit has been updated to reflect this change.

Load calculations in the final permit should be based on the effluent discharged to the River (effluent flow – Millennium Power Plant flow).

The design flow of 3.77 MGD reflects the current design flow of the facility and, this flow rate is used in conjunction with the 7Q10 to calculate water quality based effluent limits in the permit.

Comment #7 Footnote 5 adds the requirement for "flow proportional" sampling. The current permit requires one sample per hour minimum for 24 hours for NPDES sampling requirements. Currently the plant samples one sample (set volume) every 15 minutes for 24 hours to achieve a more representative sample. This is the preferred method due to the time consumption to do a "manually" calculated flow proportion sample. To automate the system for flow proportional sampling it would be necessary to install conduit and signal wiring from the flow meter to the samplers and purchase additional electronics to operate the samplers. It is unknown if the current flow meter could accommodate additional equipment due to all the controllers/recorders for chlorination & dechlorination being paced off of this meter signal. The entire system may need to be converted to a volt output vs. a 4-20 ma signal to achieve the distances necessary to connect the influent sampler. Implementing such equipment and processes could be unreasonably expensive and would not result in any improvement over the results of the current sampling protocol. It is requested that EPA remove this requirement. Should the EPA desire enhanced sampling, current samplers could be set to take a sample every 10 minutes to achieve a more representative sample.

Response: Part II of the General Requirements, Section E, Other Conditions defines composite sample as a sample consisting of a minimum of eight grab samples collected at equal intervals during a twenty-four hour period and combined proportional to flow, or a sample continuously collected proportionally to flow over the same time period.

The Agencies recommend the Town upgrade the system to comply with the regulations.

Comment #8 The Town has an infiltration and inflow removal program and continues to make progress removing unauthorized discharges. An educational public outreach program has been performed. It is requested that the 4th bullet on page 8 of the draft permit include the term "as needed".

Response: An educational public outreach program is part of the infiltration and inflow removal program and now a standard component in all municipal permits in Massachusetts. Since an established educational program has already been implemented in Southbridge, the Town should be able to use elements of the program in their I/I Control Plan.

Comment #9 The draft permit, at page 9, Section E, requires a two-year compliance schedule to meet the stringent phosphorus and aluminum limits. In conjunction with above comments, included herein, the Town requests that the DEP conduct a TMDL study for the receiving waters prior to establishing these Effluent Limits and associated Schedule of Compliance.

At a minimum, the EPA should allow one complete permit cycle (5 years) to comply with the new winter phosphorus limits, which will allow the town to pilot test alternative chemicals and unit processes for phosphorus removal. If so required, the Town will strive to meet any standards but it is unreasonable and unrealistic to require a mere two-year compliance schedule.

Response: See response to comments # 2 and 4.

A TMDL study for the Quinebaug River is required and when a TMDL has been completed the Agencies will review the effluent limits and adjust the permit limits if necessary. However, until the TMDL has been completed, we will continue to implement nutrient limits based on the narrative water quality criteria and the highest and best practicable treatment as defined in the Massachusetts Water Quality Standards for surface waters.

Comment #10 Page 9 of the draft permit, Section F (a), add an "s" to the word pas.

Response: This correction has been made in the final permit.

Comment #11 At page 7 of the Fact Sheet, Aluminum, the toxicity test results table identifies that documented aluminum results in the effluent are at or above the proposed limit of 0.28 mg/l. As previously discussed, the imposition of a more stringent phosphorus level will require the Town to test pilot additional chemicals other than Alum to meet the more stringent requirement. The substitution of additional chemicals other than Alum is a comprehensive process that will require significant research and testing. Therefore, the Town requests that the compliance schedule reflect a realistic time frame for implementing these changes.

Response: See response to comment # 4.

Comments submitted by Cindy Delpapa, Massachusetts Riverways Program on May 2, 2006.

Comment #12 The situation at the Southbridge facility is an interesting one given the diversion of up to 2 MGD of effluent possible to the Millennium Power Plant. The facility also receives a sizable contribution of industrial and commercial flows. It would be interesting to have a record of the total flow treated by the facility in addition to the required reporting of the effluent discharge volumes if only to better under stand the daily peaks in relation to the operating capacity of the facility and the potential season fluxes related to Infiltration and Inflow that may be less obvious if they coincide with diversions to the power plant.

Response: MassDEP requires permittees to submit a monthly operating report which provides information on the day to day operations at the facility such as maximum and minimum plant flow. The Town of Southbridge provides data on daily plant flow, the volume of final effluent diverted to the Millennium Power Plant, the flow returned to the treatment plant from Millennium and, the daily weather conditions. This information is reviewed by the Agencies during the permit renewal process .

The Town is not required to track and report the quantity of flow from industrial users on a monthly basis which could contribute to flow variability. See response to comment #6, also.

Comment #13 The draft permit will change the manner in which the monthly average is calculated using an annual average of the monthly averages. This rationale presented for this change is to allow more flexibility for the facility to respond to wet weather and to reflect the approach used in facilities planning documents. Having allowances for wet weather for a sanitary sewer runs counter to the intent of the separation of storm and wastewater flows. While elimination of all infiltration and inflow is not practicable, the permitting system should not actively support I&I in a sanitary collection system which is one of the arguments for the annual averaging. A reasonable amount of I&I should not result in a monthly average flow in excess of permit limits. If the I&I does result in an actual monthly average flow greater than the permit limit, it is either (a) an indication of a system with excessive I&I, a condition that needs to be addressed and should not be obfuscated by an averaging methodology, or (b) a facility nearing its capacity which should trigger facilities planning to address inadequate capacity.

Response: MassDEP issued a flow policy change in 2000 requiring the flow limit in NPDES permits to be calculated as an annual average rather than a monthly average. This policy change was meant to better reflect the basis for the design flow.

As stated in your comment a reasonable amount of I/I is expected. It was not the intent of either Agency to support excessive I/I problems in the sewer system but, to reflect the actual design flow of the facility.

The Southbridge DPW is addressing I/I conditions throughout the Town as reported in their annual I/I report. This report was a condition of the previous permit and remains a requirement in the final permit. It is part of the NPDES administrative file and available for public review. The Town has an ongoing

program to minimize I/I which includes smoke testing, TV inspections, sump pump surveys, and collection system flow monitors.

The Town has identified several sewer segments on River Street and the Hillside Road area as two areas in Southbridge with significant inflow. Language has been added to Section C. Operation and Maintenance of the Sewer System in the final permit which requires the Town to include a specific schedule for addressing these inflow sources in its I/I plan.

Comment #14 The Fact Sheet also notes the change in the monthly average flow calculation also accommodates the facilities planning which approaches the design of the plant using an annual average. It seems to be a more logical approach averaging methodology. The planning process should account for variability and accommodate peaks in the monthly flow volumes. It seems more prudent and protective to make a change in the facilities planning approach than to change a long-standing approach in Massachusetts NPDES permits, especially a change which is less protective of the receiving water than the existing permit. We would put forward it is the facilities planning process that needs adjustment and I&I control improved- not the monthly average flow methodology. We would also argue this new methodology is not as protective of the receiving waters thus it does not honor to the intent of the antidegradation or back sliding regulations.

Response: Facility plans consider a variety of design flows including short term and long term peak flow. See Response to #13 also.

Comment #15 The BOD_5 and TSS loading limitations have been adjusted for this permit to rectify an error made in the existing permit. This correction of a mistake is understandable but it may not be protective of the receiving water. The existing and draft permits are relying on a waste load allocation done over 25 years ago and the impaired status of the receiving water suggests there are on-going inputs into the Quinebaug River in this segment inhibiting the river from attaining its water quality designation. While the modest increase in BOD_5 and TSS loads may appear inconsequential, any increase in any pollutant load into this impaired waterway can only exacerbate the water quality issues documented in this waterway. It may be prudent to delay a change in the loading limits for these two pollutants until a more current assessment of the assimilative capacity of the river in this segment is completed.

Response: BOD_5 and TSS limits in this permit are more stringent than those required by secondary treatment requirements because they are based on a wasteload allocation. We agree that the WLA needs to be updated but, until it has been recalculated the permit limits must be based on the most recent data available and correct calculations.

As acknowledged in the comment the correction increases mass limits slightly for BOD_5 and TSS. Although this segment of the River is listed as impaired for dissolved oxygen and requires a Total Maximum Daily Load (TMDL), we believe the slight increase in load will have minimal impact on the River. During low flow conditions it is the concentration of BOD_5 and TSS rather than the load which contributes to low dissolved oxygen levels in the River and the

concentration limits for both parameter remains the same as in the previous permit. Increased BOD_5 and TSS loads are more of a concern when flows are higher and dissolved oxygen levels are not below State Water Quality Standards during high flows.

Comment #16 The copper limit found in the draft permit is carefully explained and a thorough presentation of the calculations to determine the acute and chronic limits is presented. There does appear to be some potential discrepancy with one of the calculations used. The average monthly limit was derived using the chronic copper criteria factor (4.53) multiplied with the dilution factor (3.17). The result of this calculation is presented as 14.97 but our calculations put the number at 14.36 which when divided by the conversion factor (0.96) results in a concentration limit of 15 mg/l (14.96 mg/l). Since metals are a reported problem contributing to this segment's impairment and the new copper concentrations will result in higher limits, this small difference appears worthy of incorporating in the draft permit until a site specific determination for copper can be ascertained.

Response: The calculation has been corrected and the average monthly effluent limit for copper is 15 ug/l in the final permit.

CCC = Chronic copper criteria (dissolved) = exp{0.8545 [ln(45)] - 1.702} (0.96) = 4.53 ug/l

Average Monthly Effluent limitation:
(CCC)(dilution factor) = (4.53)(3.17) = 14.36 ug/l (dissolved)
Average Monthly limit = 14.36/ 0.96 = 14.96 ug/l (total recoverable)

Comment #17 We are pleased to see aluminum added to the draft permit. The information provided in the permit documents the reasonable potential for the effluent discharge to exceed the National Recommended Water Quality Standards. Several of the recent instream measurements show a significant increase in aluminum concentrations between upstream and downstream suggesting the effluent is a major contributor. Is upstream/downstream concentration information also available for copper? It would be interesting to compare upstream instream measurements with those found in the effluent to ascertain if the background level is elevated enough to make the effluent copper calculation insufficiently conservative because background levels are elevated and this condition is not incorporated into the copper calculation.

Response: Limited instream copper data is reported in the Town's toxicity tests but, there is no data reflecting 7Q10 conditions.

Copper limits in the final permit are based on instream hardness, a dilution factor based on low flow stream conditions and water quality criteria for copper.

Comment # 18 The draft permit is making progress in addressing the nutrient issue which is cited in the water quality assessments for this segment as a contributor to impairment, (though not in the upstream segment). The West Dudley impoundment downstream of the effluent discharge is also impaired with visible signs of eutrophication. The existing situation in the receiving waters and downstream impoundment strongly suggests nutrients are at least a part of the

causative agents in the impairment. The impairments in the segments and the need for a TMDL is a strong argument for comprehensive information on the nutrient concentrations and loads being discharged by this facility.

The addition of a 0.2 mg/l average monthly, summer limitation for total phosphorus is a key step in beginning to remediate impairments in the river. We would very much like to see, if not a limitation, a report requirement for maximum daily concentration. This information will provide a more complete picture of the nutrient inputs into the receiving water. Ideally load limitations would also be added to the permit since this facility has had instances of discharges above the permitted 3.77 MGD flow limit which could lead to a situation where concentration is within limits but the load is larger than intended because of the increase flow. Loads would be especially helpful information when the TMDL for the down stream impoundments was being prepared. In addition, we would like to urge a report requirement for soluble reactive phosphorus concentrations. This addition would augment the other nutrient data being collected and increase the understanding of the dynamic between the total phosphorus released from the facility during the colder months and that fraction which is more likely to pass through the long, linear West Dudley impoundment.

Response: Reporting requirements have been added to the final permit for maximum daily total phosphorus, orthophosphate and for total phosphorus loads. Future permits may require a load limit if it becomes necessary.

Comment #19 The draft permit has only an average monthly limitation for ammonia nitrogen though the remaining summer month limitations have average weekly and maximum daily limitations in addition to the monthly average. Given the typically high flows in April in Massachusetts, the single monthly average limitation would be reasonable but one must consider the possibility for an atypical April. We have recently experienced river flows in April approaching summer lows due to negligible snow pack and few spring storms. We also know this waterway is impaired because of organic enrichment and low dissolved oxygen. One final point, the nearby USGS gage in the Quinebaug River shows rapid and dramatic fluctuations in flow related to upstream hydro-manipulation which can lead to unexpected seasonal flows. We would encourage the addition of maximum daily and even average weekly limitations to the permit to be protective of the receiving waters for these occasional or artificial low flow spring occurrences.

Response: A weekly average and maximum daily reporting requirement for ammonia nitrogen has been added to the final permit.

While there are years when April flows are low, they would still significantly exceed 7Q10 flow. Therefore, we believe the monthly average limit will ensure that short term excursions will not cause a violation of standards.

Comment #20 We are pleased to see the whole effluent testing still requires quarterly testing with two species. This facility's WET compliance record is not outstanding and it appears both test species have shown sensitivity. As the Fact Sheet indicates, the high flow WET testing has not shown a strong correlation between high flows and poor acute or chronic toxicity

results. Under these circumstances an elimination of the additional high flow WET tests is reasonable though we hope a toxicity evaluation will be initiated if the facility continues to have sporadic poor WET results. There have been some extremely poor results in the past and the poor results have not been isolated. It there is this level of toxicity found during only four tests through an entire year, we have serious concerns about what these relatively frequent failures imply about the toxicity of the effluent day after day. We would also like to encourage consideration be given to changing the criteria to be met before requesting a reduction in WET testing frequency from one year to two. This request is based on the past compliance history of the facility where the facility has been able to submit four consecutive good tests in a given year but has not been able to go two years without a problem. This change would eliminate a premature request for a reduction which agency staff would have to consider.

Response: The toxicity tests requirements in the final permit reflect those that were in the draft permit. EPA Region 1 policy requires the number of toxicity tests conducted each year be based on the available dilution in the receiving water at the point of discharge. Four tests are required when the dilution in less than 10. The available dilution for this facility is 3.17, so unless the dilution changes or there is a policy change the permittee is required to complete four toxicity tests in this and subsequent permits.

Under this policy, the permittee may contact EPA to request that their toxicity tests requirements be reduced. Generally, the number of species rather than the number of tests required in the permit are reduced. In this case, upon completion of four consecutive toxicity, the number of species used in the tests may be reduced to the more sensitive one. However, a reduction in the toxicity tests requirements is not automatic, the Agencies conduct a careful review of past tests to determine whether or not a reduction in their permit requirements are justified.