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, (MGL Chap. 21, §§26-53),

Town of Palmer
4417 Main Street
Palmer, MA 01069

is authorized to discharge from a facility located at:

Palmer Water Pollution Control Facilities
Norbell Street
Three Rivers, Massachusetts 01080

and from six combined sewer overflows (CSOs) to receiving waters named: **Chicopee River**, **Quaboag River (1 CSO), and Ware River (5 CSOs)**

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

This permit shall become effective on the first day of the calendar month immediately following 60 days after signature.

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

This permit supersedes the permit issued on September 29, 2000. This permit consists of 19 pages in Part I including effluent limitations, monitoring requirements, **Attachments A (Discharge Outfall), B (Combined Sewer Overflows), C (Acute Toxicity Testing Protocol), D (left out intentionally), E (Industrial Pretreatment Program Annual Report)**, **F (Reassessment of Technically Based Industrial Discharge Limits)**, **G (Report Summary)**, and Part II including General Conditions and Definitions.

Signed this 21st day of January, 2011

/S/SIGNATURE ON FILE

Stephen S. Perkins, Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

David Ferris, Director
Massachusetts Wastewater Management Program
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Outfall 027

a. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 027 to the Chicopee River. Such discharge shall be limited and monitored by the permittee as specified below.

Effluent Characteristic	**Units**	**Discharge Limitation**			**Monitoring Requirement** [*3]	
Parameter		**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**[*3]
Flow (Annual Average)[*2]	MGD	5.6 [*2]	—	Report	Continuous	Recorder
Flow[*2]	MGD	Report	—	Report	Continuous	Recorder
BOD_5 [*4]	mg/l	30	45	Report	2/Week	24-Hour Composite*[5]
	lbs/day	1400	2100	—	2/Week	24-Hour Composite*[5]
TSS [*4]	mg/l	30	45	Report	2/Week	24-Hour Composite*[5]
	lbs/day	1400	2100	—	2/Week	24-Hour Composite*[5]
pH[*1]	Standard Units (SU)	6.0 – 8.3 SU (See Permit Part I.A.1.c.)			1/Day	Grab
Fecal Coliform Bacteria[*1,* 6] (April 1 - Oct. 31)	cfu /100 ml	200	—	400	1/Week	Grab
E. coli Bacteria[*1, *6] (April 1 - Oct. 31)	cfu/100 ml	126	—	409	2/Week	Grab
Total Residual Chlorine [*1,*7, *8] (April 1 - Oct. 31)	mg/l	0.16	—	0.28	3/Day	Grab
Copper, Total Recoverable	ug/l	50.9	—	69.1	1/Month	24-Hour Composite[*5]

Part A.1.a. (Continued);

Effluent Characteristic	Units	Discharge Limitation			Monitoring Requirement	
Parameter		**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[*3]**
Total Nitrogen[*9]	mg/l	Report	—	Report	1/Week	24-Hour Composite[*5]
Total Ammonia Nitrogen[*10]	mg/l	Report	—	Report	1/Week	24-Hour Composite[*5]
Total Kjeldahl Nitrogen[*10]	mg/l	Report	—	Report	1/Week	24-Hour Composite[*5]
Total Nitrate Nitrogen[*10]	mg/l	Report	—	Report	1/Week	24-Hour Composite[*5]
Total Nitrite Nitrogen[*10]	mg/l	Report	—	Report	1/Week	24-Hour Composite[*5]
Total Phosphorus (May 1 - Oct. 31)	mg/l	1.0	2.0	—	2/Week	24-Hour Composite*[5]
Total Phosphorus (Nov 1 - April 30) [*11]	mg/l	1.0	—	—	1/Month	24-Hour Composite*[5]
Ortho-phosphorus, dissolved [*15]	lbs/day	Report	—	—	1/Month	24-Hour Composite*[5]
(Nov 1-March 31)	mg/l	Report	—	—	1/Month	24-Hour Composite*[5]
Whole Effluent Toxicity [*1, *12, *13, *14]	%	Acute	$LC_{50} \geq 100\%$		2/Year	24-Hour Composite*[5]

Footnotes:

*1. Required for State Certification.

*2. Report annual average, monthly average, and the maximum daily flow. The limit is an annual average, which shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the eleven previous months.

*3. A routine sampling program will be developed in which samples are taken at the same location, same time (or, within one hour of a set time) and same days of every month. Occasional deviations from the routine sampling program described above are allowed, but the reason for the deviation will be documented in correspondence appended to the applicable discharge monitoring report.

All samples will 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 will be 24 hour composites unless specified as a grab sample in 40 CFR § 136.

All required effluent samples shall be collected at the point specified herein. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

PARAMETER:	SAMPLE LOCATION:
FLOW	Recorder in the Effluent Flume
FECAL, E-COLI and TOTAL CHLORINE RESIDUE	After discharge from the chlorine contact chamber and dechlorination process, prior to discharge into the Chicopee River
BOD_5, TSS, pH RANGE, TOTAL AMMONIA AS N, TOTAL KJELDAHL NITROGEN, TOTAL NITRITE, TOTAL NITRATE, and WHOLE EFFLUENT TOXICITY	After discharge from the chlorine contact chamber and dechlorination process, prior to discharge into the Chicopee River WET Dilution Water: Chicopee River Upstream of treated wastewater discharge outfall
BOD and TSS (Influent)	Influent line prior to primary tanks

*4. Sampling is required for influent and effluent.

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

*6. *Escherichia coli (E. coli)* and fecal coliform bacteria limitations and monitoring requirements are effective from April 1st through October 31st. The monthly average limits are expressed as geometric means. The fecal coliform limitations and monitoring requirements will expire on **October 31, 2011.** The E. coli limitations and monitoring requirements will become effective on **April 1, 2012.** *E. coli* and fecal coliform bacteria samples will be collected concurrently with total residual chlorine samples.

*7. Total residual chlorine limits and monitoring requirements are in effect from **April 1st through October 31st**. The permittee is not authorized to discharge chlorine from November 1st through March 31st. Each week, two of the total residual chlorine samples will be collected concurrently with the required *E. coli* bacteria samples.

The minimum detection level (ML) for total residual chlorine (TRC) is defined as 0.02 mg/l. EPA defines the minimum level as the level at which the entire analytical system will give recognizable signal and calibration points. For total residual chlorine, this is the minimum level for chlorine using EPA-approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G, or USEPA Manual of Methods of Analysis of Water and Wastewater, Method 330.5. One of these methods must be used to determine total residual chlorine. For effluent limitations less than 0.02 mg/l, compliance/non-compliance will be determined based on the ML. Sample results of 0.02 mg/l or less shall be reported as zero on the discharge monitoring report (DMR).

For every day that more than three TRC samples are analyzed, the monthly DMR will include an attachment documenting the individual grab sample results for that day, the date and time each sample was collected, the analytical method used, and a summary of any operational modifications implemented in response to the sample results. This requirement applies to all samples taken, including screening level and process control samples. All test results using an EPA-approved analytical method will 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. Chlorination and dechlorination systems shall include an alarm system on or before **April 1, 2011** for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

*9. See Part I.B, Special Conditions, for requirements to evaluate and implement optimization of nitrogen removal. Once per month Nitrogen sampling will be required until **July 1, 2011**. Once per week Nitrogen sampling will be required beginning the week of **July 3, 2011**.

*10. Total ammonia nitrogen, total Kjeldahl nitrogen, nitrite nitrogen, and nitrate nitrogen samples shall be collected concurrently. Once per month Nitrogen sampling will be required until **July 1, 2011**. Once per week Nitrogen sampling will be required beginning the week of **July 3, 2011**.

*11. See Part I.C. Effective Date for Phosphorus Limitation.

*****12. 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.

*****13. The permittee shall conduct acute toxicity tests two times per year. The permittee shall test the daphnid, *Ceriodaphnia dubia*, only. Toxicity test samples will be collected during the months of February, and August. The test results will be submitted by the last day of the month following the completion of the test. The results are due March 31st, September 30th, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment C** of this permit.

Test Dates during the second week of	**Submit Results By:**	**Test Species**	**Acute Limit LC_{50}**
February August	March 31st September 30th	*Ceriodaphnia dubia* (Daphnid) See **Attachment C**	≥ 100%

The permittee shall submit a map showing the ambient receiving water sample location and the discharge location with the first test result after the effective date of the permit and again if the sample location changes.

*14. 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 C 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 C**, 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. This guidance is found in Attachment G of NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs) which is sent to all permittees with their annual set of DMRs and may also be found on the EPA, Region I web site at http://www.epa.gov/region01/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment C**. Any modification or revocation to this guidance 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 C**. If the permittee uses an alternative dilution water, the ambient water will still need to be tested.

*15. The monitoring requirement for ortho-phosphorus will begin on **November 1, 2011**.

Part I.A.1. (Continued)

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

c. The pH of the effluent will not be less than 6.0 nor greater than 8.3 SU at any time.

d. The discharge will not cause objectionable discoloration of the receiving waters.

e. The effluent will contain neither a visible oil sheen, foam, nor floating solids at any time.

f. If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee will submit a report to MassDEP by **March 31st** of the following calendar year describing their plans for future flow increases and how they will maintain compliance with the flow limitation and all other effluent limitations and conditions in the permit.

g. The permittee's treatment facility will maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather conditions. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rain and no snow melt. The percent removal will be based on monthly average values. When the collection system becomes separated, this requirement will become effective during wet and dry weather conditions.

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 will include information on:

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

3. Prohibitions Concerning Interference and Pass Through:

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

4. Toxics Control

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

   b. Any toxic components of the effluent will 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

   a. 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 § 122.

B. SPECIAL CONDITIONS

Within **one year of the effective date of the permit**, the permittee shall complete an evaluation of alternative methods of operating the existing wastewater treatment facility to optimize the removal of nitrogen, and submit a report to EPA and MassDEP documenting this evaluation and presenting a description of recommended operational changes. The methods to be evaluated include, but are not limited to, operational changes designed to enhance nitrification (seasonal and year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. The permittee shall implement the recommended operational changes in order to maintain the mass discharge of total nitrogen less than the existing annual average discharge load. The annual average total nitrogen load from this facility is estimated to be 376 lbs/day, based on data reported from 2004 through 2005.

The permittee shall also submit an annual report to EPA and the MassDEP, by **February 1st** each year, that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year.

C. EFFECTIVE DATE FOR PHOSPHORUS LIMITATION

The 1.0 mg/l seasonal (**November 1st – March 31st**) total phosphorus limit in this permit shall become effective on **November 1, 2011**. The permittee will report the average monthly and maximum daily values of total phosphorus in the discharge for the months of the first winter period in which this permit is effective.

D. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from outfall 027 listed on **Attachment A** and in Part I.A.1.a. of this permit and active CSOs listed on **Attachment B** of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) are not authorized by this permit and will be reported to both EPA and the MassDEP in accordance with Part II. Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting).

Notification of SSOs to MassDEP will be made on its SSO reporting form (which includes MassDEP regional office telephone numbers). The reporting form and instructions for its completion can be found on-line at: http://www.mass.gov/dep/water/approvals/surffms.htm#sso.

E. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

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

1. Maintenance Staff

   The permittee will 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 will maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program will include an inspection program designed to identify all potential and actual unauthorized discharges.

3. Infiltration/Inflow Control Plan:

   The permittee will develop and implement a plan to control infiltration and inflow (I/I) to the separate sewer system. The Town of Palmer may incorporate any part of their Combined Sewer Overflow (CSO) Long Term Control Plan into their Infiltration/Inflow Plan by reference. The I/I Control Plan shall be submitted to EPA and MassDEP **within six (6) months of the effective date** of this permit (see page 1 of this permit for the effective date) and shall describe the permittee's program for preventing infiltration/inflow related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and by-passes due to excessive infiltration/inflow.

   The plan shall include:

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

   - An inflow identification and control program that focuses on the disconnection and

redirection of illegal sump pumps and roof down spouts. Priority should be given to removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.

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

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

Reporting Requirements:

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and the MassDEP annually, by **February 28th** of each year. The summary report will, 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.

4. Alternate Power Source

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

F. SLUDGE CONDITIONS

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

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

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

5. The 40 CFR §503 requirements include the following elements:

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

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

6. The sludge shall be monitored for pollutant concentrations (all 40 CFR § 503 methods) and pathogen vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year:

less than 290	1/ year
290 to less than1500	1 /quarter
1500 to less than 15000	6 /year
15000 +	1 /month

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

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

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

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

   - Name and address of contractor(s) responsible for sludge preparation, use or disposal.
   - Quantity of sludge (in dry metric tons) by which the contractor will prepare and use or dispose of the sewage sludge.

G. DEVELOPMENT OF LIMITATIONS FOR INDUSTRIAL USERS:

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

2. The permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users as appropriate, which together with appropriate changes in the POTW Treatment Plant's Facilities or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. **Within 90 days of the effective date of the permit**, the permittee shall prepare and submit a written technical report to 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. Should the evaluation reveal the need to revise local limits, the permittee must submit a local limits report to EPA **within 120 days** of notification by EPA and submit the revisions to EPA for approval. If local limits are to be updated, revisions should be performed in accordance with EPA's Local Limits Development Guidance (July, 2004).

H. INDUSTRIAL PRETREATMENT PROGRAM

1. Palmer shall implement an industrial pretreatment program as required by 40 CFR § 403. The industrial pretreatment program shall be operated in accordance with Palmer's approved pretreatment program plan and 40 CFR § 403. At a minimum, Palmer shall perform the following activities in implementing and operating its industrial pretreatment program:

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

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

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

   d. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

2. The permittee shall provide EPA and the MassDEP with an annual report required by 40 CFR § 403.12(i) by **June 1st** of each year for Palmer's reporting period of April 1 - March 31. The annual report shall be consistent with the format described in **Attachment E** of this permit.

3. 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).

4. 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.

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

6. On October 14, 2005 EPA published in the Federal Register final changes to the General Pretreatment Regulations. The final "Pretreatment Streamlining Rule" is designed to reduce the burden to industrial users and provide regulatory flexibility in technical and administrative

requirements of industrial users and POTW's. Within 60 days of the effective date of this permit, the permittee must submit to EPA all required modifications of the Streamlining Rule in order to be consistent with the provisions of the newly promulgated Rule. To the extent that the POTW legal authority is not consistent with the required changes, they must be revised and submitted to EPA for review.

I. COMBINED SEWER OVERFLOWS (CSO)

1. Until **December 15, 2011**, during wet weather, the permittee is authorized to discharge storm water/wastewater from combined sewer outfalls listed in **Attachment B** of this permit, subject to the following effluent limitations:

   a. The discharges shall receive treatment at a level providing Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT) to control and abate conventional pollutants and Best Available Technology Economically Achievable (BAT) to control and abate non-conventional and toxic pollutants. The EPA has made a Best Professional Judgement (BPJ) determination that BPT, BCT, and BAT for combined sewer overflows (CSOs) include the implementation of Nine Minimum Controls (NMC) specified below and detailed further in Part I.I.3., "Nine Minimum Controls Minimum Implementation Levels" of this permit:

      (1) Proper operation and regular maintenance programs for the sewer system and the combined sewer overflows.

      (2) Maximum use of the collection system for storage.

      (3) Review and modification of the pretreatment program to assure CSO impacts are minimized.

      (4) Maximization of flow to the POTW for treatment.

      (5) Prohibition of dry weather overflows from CSOs.

      (6) Control of solid and floatable materials in CSOs.

      (7) Pollution prevention programs that focus on contaminant reduction activities.

      (8) Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts.

      (9) Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

   b. **Within 6 months of the effective date of the permit**, the permittee shall submit to EPA updated documentation on its implementation of the Nine Minimum Controls. Implementation of the Nine Minimum Controls is required by the effective date of the permit. EPA and MassDEP consider that approvable documentation must include the

minimum requirements set forth in Part I.I.3. of this permit and additional activities the permittee can reasonably undertake.

c. The discharges shall not cause or contribute to violations of federal or state Water Quality Standards.

2. The permittee may consolidate CSO reports which are on similar reporting schedules.

3. Nine Minimum Controls Minimum Implementation Levels

a. The permittee must implement the nine minimum controls in accordance with documentation provided to EPA and MassDEP or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the following controls plus other controls the permittee can reasonably undertake as set forth in the documentation.

b. Each CSO structure/regulator, pumping station and/or tidegate shall be routinely inspected to insure that they are in good working condition and adjusted to minimize combined sewer discharges and tidal surcharging. Such inspections shall occur monthly unless EPA approves a site specific inspection program which has been determined by EPA to provide an equal level of effectiveness. (NMC #1, 2, and 4). The following inspection results shall be recorded: the date and time of the inspection, the general condition of the facility, and whether the facility is operating satisfactorily. If maintenance is necessary, the permittee shall record: the description of the necessary maintenance, the date the necessary maintenance was performed, and whether the observed problem was corrected. The permittee shall maintain all records of inspections for at least three (3) years.

Annually, no later than **January 15th**, the permittee shall submit a certification to MassDEP and EPA which states that the previous calendar year's monthly inspections were conducted, results recorded, and records maintained.

MassDEP and EPA have the right to inspect any CSO related structure or outfall, without prior notification to the permittee.

c. Discharges to the combined system of septage, holding tank wastes or other material which may cause a visible oil sheen or containing floatable material are prohibited during wet weather when CSO discharges may be active. (NMC# 3, 6, and 7).

d. Dry weather overflows (DWOs) are prohibited (NMC# 5). All dry weather sanitary and/or industrial discharges from CSOs must be reported to EPA and the State within twenty four (24) hours in accordance with the reporting requirements for plant bypass (Paragraph D.1.e. of Part II of this permit).

e. The permittee shall quantify and record all Palmer discharges from combined sewer outfalls (NMC# 9). Quantification may be through direct measurement or estimation. When estimating, the permittee shall make reasonable efforts, i.e., gaging or

measurements, to verify the validity of the estimation technique. The following information must be recorded for each combined sewer outfall for each discharge event:

(1) Estimated duration (hours) of discharge;

(2) Estimated volume (gallons) of discharge; and

(3) National Weather Service precipitation data from the nearest gage where precipitation is available at daily (twenty four (24) hour) intervals and the nearest gage where precipitation is available at one-hour intervals. Cumulative precipitation per discharge event shall be calculated.

The permittee shall maintain all records of discharges for at least **six (6) years after the effective date** of this permit.

Annually, no later than January 15th, the permittee shall submit a report containing the required discharge monitoring information for all combined sewer discharges during the previous calendar year.

f. The permittee shall maintain identification signs for all combined sewer outfall structures. The signs must be located at or near the combined sewer outfall structures and be easily readable by the public from both the land and the water. These signs shall be a minimum of twelve by eighteen (12 x 18) inches in size, with white lettering against a green background, and shall contain the following information:

WARNING:
WET WEATHER
SEWAGE DISCHARGE
PALMER OUTFALL (discharge serial number)

The permittee, to the extent feasible, shall place additional signs in languages other than English or add a universal wet weather sewage discharge symbol to existing signs based on a consideration of the primary language(s) of the residents and users of the water resources in the vicinity of the CSOs.

4. Nine Minimum Controls Reporting Requirement

Annually, no later than January 15th, the permittee shall submit a report summarizing activities during the previous calendar year relating to compliance with the nine minimum controls including the required information on the frequency, duration, and volume of discharges from each CSO.

J. MONITORING AND REPORTING

1. **For a period of one year from the effective date of the permit**, the permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit discharge monitoring

reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the permit**, the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting all DMRs and reports. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

a. Submittal of Reports Using NetDMR

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

DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA, including the MassDEP Monthly Operations and Maintenance Report, as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs (including Monthly Operation and Maintenance Reports) to MassDEP until further notice from MassDEP.

b. Submittal of NetDMR Opt Out Requests

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

All opt out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-1)
Boston, MA 02109-3912

And

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

c. Submittal of Reports in Hard Copy Form

Hard copy DMR submittals shall be completed and postmarked no later than the 15th day of the month following the completed reporting period. MassDEP Monthly Operation and Maintenance Reports shall be submitted as an attachment to the DMRs. Signed and dated originals of the DMRs, and all other reports required herein, shall be submitted to the appropriate State and EPA addresses listed below:

The Federal Agency address is:

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

The State Agency address is (i.e., all hard copy DMR forms and all other reports, excluding toxicity test reports):

Massachusetts Department of Environmental Protection
Western Regional Office - Bureau of Resource Protection
436 Dwight Street
Springfield, MA 01103

The State Agency address is (i.e., all hard copy DMR forms and toxicity test reports):

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

Hard copy original signed and dated Industrial Pretreatment Program Reports required by this permit will be submitted to the Director at:

U.S Environmental Protection Agency
5 Post Office Square – Suite 100
Attn: Justin Pimpare
Mail Stop – OEP06-3
Boston, MA 02114

and a hard copy of the Industrial Pretreatment Program Reports will be sent to the State at:

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention
Industrial Wastewater Program
One Winter Street
Boston, MA 02108

K. STATE PERMIT CONDITIONS

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

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

3. Each Agency will have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit will be effective only with respect to the Agency taking such action, and will 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 will 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 will remain in full force and effect under State law as a permit issued by the Commonwealth of Massachusetts.

Attachment A
Advanced Wastewater Treatment Plant Discharge Outfall
NPDES Permit No. MA0101168
Palmer, MA

Outfall:	Description of Discharge:	Outfall Location/Receiving Water:
027	Advanced Wastewater Treatment Plant Effluent	Chicopee River

Attachment B
Combined Sewer Overflows
NPDES Permit No. MA0101168
Palmer, MA

Outfall:	Outfall Location:	Regulating Structure:	Status:	Receiving Water:
008	Rt. 181 / PS #2, Palmer	B & B	Active	Quaboag River
018	Riverside St., Three Rivers	TW & O	Active	Ware River
021A	Pine St., Thorndike	TW & O	Active	Ware River
022	Main St., Thorndike	TW & O	Active	Ware River
023A	Summer St., Thorndike	TW & O	Active	Ware River
023B	Summer St., Thorndike	TW & O	Active	Ware River

Note: "B & B" = Brown & Brown
"TW & O" = Transverse Weir & Orifice

Attachment D
Advanced Wastewater Treatment Plant Discharge Outfall
NPDES Permit No. MA0101168
Palmer, MA

(left out intentionally)

Attachment G
Advanced Wastewater Treatment Plant Discharge Outfall
NPDES Permit No. MA0101168
Palmer, MA

Report Summary

This Table is a summary of reports required to be submitted under this NPDES permit as an aid to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.

Required Report:	Date Due:	Submitted To: (see next page for key)
Discharge Monitoring Report (DMR)	Monthly, post-marked by the 15th of the month following the monitoring month (e.g., the March DMR is due by April 15th)	1, 2, 3
Whole Effluent Toxicity (WET) Test Report (Part I.A.1.)	March 31st, September 30th	1, 2, 3
Pretreatment Technical Evaluation (Part I.G.)	Within 90 days of permit effective date	1, 2, 4, 5
Pretreatment Annual Report (Part I.F.)	June 1st each year	1, 2, 4, 5
I/I Control Plan (Part I.E.)	Within 6 months of permit effective date	1, 2
I/I Annual Report (Part I.E.)	By February 28th each year	1, 2
Annual Sludge Report (Part I.F.8.)	By February 19th each year	1, 2
CSO Nine Minimum Controls Update (I.I.1.b)	Within 6 months of permit effective date	1, 2
CSO Inspection Certification (Part I.I.3.b.)	By January 15th each year	1, 2
CSO Annual Report (Part I.I.3.e)	By January 15th each year	1, 2
Nitrogen Optimization and Recommendation Report (Part I.B.)	Within 1 year of permit effective date	1, 2
Nitrogen Optimization, Annual Report (Part I.B.)	February 1st each year	1, 2

Attachment G, Continued;

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

2. Massachusetts Department of Environmental Protection
   Western Regional Office - Bureau of Resource Protection
   436 Dwight Street
   Springfield, MA 01103

3. Massachusetts Department of Environmental Protection
   Surface Water Discharge Permit Program
   627 Main Street, 2nd Floor
   Worcester, Massachusetts 01608

4. U.S Environmental Protection Agency
   5 Post Office Square – Suite 100
   Attn: Justin Pimpare
   Mail Stop – OEP06-3
   Boston, MA 02114

5. Massachusetts Department of Environmental Protection
   Bureau of Waste Prevention
   Industrial Wastewater Program
   One Winter Street
   Boston, MA 02108

Attachment E
Industrial Pretreatment Program Annual Report
NPDES Permit No. MA0101168
Palmer, MA

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

1. An updated list of all industrial users by category, as set forth in 40 CFR 403.8(f)(2)(i), indicating compliance or noncompliance with the following:

   i. Baseline monitoring reporting requirements for newly promulgated industries,
   ii. Compliance status reporting requirements for newly promulgated industries,
   iii. Periodic (semi-annual) monitoring reporting requirements,
   iv. Categorical standards, and
   v. Local limits;

2. A summary of compliance and enforcement activities during the preceding year, including the number of

   i. Significant industrial users inspected by POTW (include inspection dates for each industrial user),
   ii. Significant industrial users sampled by POTW (include sampling dates for each industrial user),
   iii. Compliance schedules issued (include list of subject users),
   iv. Written notices of violations issued (include list of subject users),
   v. Administrative orders issued (include list of subject users),
   vi. Criminal or civil suits filed (include list of subject users) and,
   vii. Penalties obtained (include list of subject users and penalty amounts);

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

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

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

At a minimum, annual sampling and analysis of the influent and effluent of the Palmer's wastewater plant shall be conducted for the following pollutants:

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

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

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

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

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

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

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

11. Information on any new introduction of pollutants into Palmer’s sewer system from a user which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants and on any substantial change in the volume or character of pollutants being introduced into Palmer’s sewer system by a user. For purposes of this paragraph, adequate notice shall include information on the quality and quantity of effluent introduced into Palmer’s sewer system and any anticipated impact of the change on the quantity or quality of effluent to be discharged from Palmer’s treatment plant.

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

FACT SHEET

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

NPDES PERMIT NO.: **MA0101168**

NAME AND ADDRESS OF APPLICANT:

Town of Palmer
4417 Main Street
Palmer, Massachusetts 01069

The Towns of Monson and Belchertown are included as co-permittees for specific activities required by the draft permit. See Section VII of this fact sheet and Parts D and E of the draft permit. The Town departments are located at the following addresses:

Town of Monson
Water and Sewer Department
198 WD Main Street, P.O. Box 3888
Monson, MA 01057

Town of Belchertown
Department of Public Works
290 Jackson Street, P.O. Box 306
Belchertown, MA 01007

NAME AND ADDRESS OF FACILITY WHERE THE DISCHARGE OCCURS:

Palmer Water Pollution Control Facilities
Norbell Street
Three Rivers, Massachusetts 01080

TO RECEIVING WATERS: **Chicopee River** (WWTF Outfall 027)**, Quaboag River** (1 active CSO)**, and Ware River** (5 active CSOs)

in accordance with effluent limitations, monitoring requirements and other conditions set forth in the permit. The Town of Monson and the Town of Belchertown are co-permittees for **Parts D and E** of the permit. Only municipalities listed as co-permittees are authorized to discharge wastewater into the Town of Palmer's Water Pollution Control Facility.

CLASSIFICATION: **B (Warm Water Fishery, and CSO Impacted)**

Table of Contents

I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency for re-issuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving waters. The existing permit expired on November 26, 2005 and is still in effect. The draft permit is written with an expiration date 5 years from the effective date of the final permit.

II. TYPE OF FACILITY AND DISCHARGE LOCATION

The facility is an advanced wastewater treatment plant and is engaged in the collection and treatment of municipal and industrial wastewater, and storm water. The outfall pipe of the treatment plant discharges into the Chicopee River.

The facility's treated discharge outfall is listed below:

Outfall:	Description of Discharge:	Outfall Location:
027	Advanced Wastewater Treatment Plant Effluent	$42^{O}10'48"$ / $72^{O}22'5"$

During certain wet weather events, the Town of Palmer also conveys untreated wastewater and storm water flow through combined sewer overflows (CSOs) directly to receiving waters. There are currently six (6) active CSOs. One active CSO is located in the Village of Depot (Palmer), one is in the Village of Three Rivers, and four are in the Village of Thorndike. The Village of Depot CSO discharges into the Quaboag River, and the other five (5) CSOs discharge into the Ware River. There are no CSOs located in the Village of Bondsville. All of the CSOs that previously discharged into the Chicopee River and Swift River have been eliminated. In accordance with an EPA Administrative Consent Order, the six (6) remaining CSOs will be eliminated by the end of the year 2011. The facility's combined sewer overflow (CSO) discharge outfalls are listed in **Attachment B** of the NPDES permit.

This facility currently serves three industrial users. All three of the industrial users, Rathbone Precision Metals, Inc., Profiles, Inc., and Lamcotec, Inc., have been in compliance with the required Federal Categorical Pretreatment and Local Industrial Pretreatment Standards, and have not caused any upsets at the Palmer Water Pollution Control Facility to date. The facility's location is shown in **Figure 1**.

III. DESCRIPTION OF THE DISCHARGE

The treatment processes at the wastewater treatment facility (WWTF) include screening, primary clarification, activated sludge treatment, secondary clarification, tertiary clarification, chlorine disinfection, and dechlorination. This facility will replace its use of chlorine gas with sodium hypochlorite during this next year. The discharge is disinfected seasonally from April 1st through October 15th. The draft permit extends the disinfection season to October 31st.

Waste sludge is pumped to gravity thickeners and dewatered using a two-meter belt filter press. The thickened liquid (approximately 3%) or cake (approximately 18-20%) is trucked off-site to Synagro Northeast Inc, which has two fluid bed sewage sludge incineration plants. One is located in Waterbury, Connecticut, and another is located in Woonsocket, Rhode Island. The Palmer WWTF generates approximately 411.9 dry metric tons of sludge each year.

A quantitative description of the wastewater treatment plant discharge in terms of significant effluent parameters based on recent monitoring data is shown on **Attachment A** of this fact sheet. This facility's flow schematic is shown in **Figure 2**.

IV. LIMITATIONS AND CONDITIONS

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

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

1. General Regulatory Background

Congress enacted the Clean Water Act (CWA), "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." See CWA §101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except as authorized by specific permitting sections of the CWA, one of which is Section 402. See CWA §§ 303(a), 402(a). Section 402(a) establishes one of the CWA's principal permitting programs, the National Pollutant Discharge Elimination System (NPDES). Under this section, EPA may "issue a permit for the discharge of any pollutant, or combination of pollutants" in accordance with certain conditions. See CWA § 402(a). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. See CWA § 402(a)(1)-(2).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" limitations and "water quality-based" limitations. See CWA §§ 301, 304(b); 40 C.F.R. 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted. See CWA § 301(b). As a class, publicly owed treatment works ("POTWs") must meet performance-based requirements based on available wastewater treatment technology. See CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment". Secondary treatment is comprised of technology-based requirements expressed in terms of BOD_5, TSS, and pH. See 40 C.F.R. Part 133.

Water quality-based effluent limits are designed to ensure that State water quality standards are met regardless of the decision made with respect to technology and economics in establishing technology-based limitations. In particular, Section 301(b)(1)(C) requires achievement of, "any more stringent limitation, including those necessary to meet water quality standards…established pursuant to any State law or regulation…" See 40 C.F.R. §§ 122.4(d)(1) (providing that a permit must contain effluent limits as necessary to protect State water quality standards, "including State narrative criteria for water quality") (emphasis added) and 122.44(d)(5) (providing in part that a permit incorporate any more stringent limits required by Section 301(b)(1)(C) of the CWA).

The CWA requires that States develop water quality standards for all water bodies within the State. See CWA § 303. These standards have three parts: (1) one or more "designated uses" for each water body or water body segment in the state; (2) water quality "criteria", consisting of numeric concentration levels and/or narrative statements specifying the amounts of various pollutants that may be present in each water body without impairing the designated uses of that water body; and (3) an anti-degradation provision, focused on protecting existing uses. See CWA § 303(c)(2)(A) and 40 C.F.R. § 131.12. The limits and conditions of the permit reflect the goal of the CWA and EPA to achieve and then to maintain water quality standards.

Receiving stream requirements are established according to numeric and narrative standards adopted under State law for each stream classification. When using chemical-specific numeric criteria from the State's water quality standards to develop permit limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable in-stream pollutant concentrations. Acute aquatic life criteria are generally implemented through average monthly limits.

Where a State has not established a numeric water quality criterion for a specific chemical pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use," on a "case-by-case basis" using CWA Section 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, in certain circumstances, based on an indicator parameter. See 40 C.F.R. § 122.44(d)(1)(vi)(A-C).

All statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired. When technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. See 40 C.F.R. § 125.3(a)(1). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit. The regulations governing EPA's NPDES permit program are generally found in 40 C.F.R. Parts 122, 124, 125, and 136.

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

Reasonable Potential

In determining reasonable potential, EPA considers: 1) existing controls on point and non-point sources of pollution; 2) pollutant concentration and variability in the effluent and receiving water as determined from the permit's reissuance application, DMRs, and State and Federal Water Quality Reports; 3) sensitivity of the species to toxicity testing; 4) the statistical approach outlined in *Technical Support Document for Water Quality-Based Toxics Control*, March 1991, EPA/505/2-90-001 in Section 3; and, where appropriate, 5) dilution of the effluent in the receiving water.

Anti-Backsliding

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

State Certification

Section 401(a)(1) of the CWA requires all NPDES permit applicants to obtain a certification from the appropriate state agency stating that the permit will comply with all applicable federal effluent limitations and State water quality standards. See CWA § 401(a)(1). The regulatory provisions pertaining to State certification provide that EPA may not issue a permit until a certification is granted or waived by the state in which the discharge originates. See 40 C.F.R. § 124.53(a). The regulations further provide that, "when certification is required…no final permit shall be issued…unless the final permit incorporates the requirements specified in the certification under § 124.53(e)." See 40 C.F.R. § 124.55(a)(2). Section 124.53(e) in turn provides that the State certification shall include "any conditions more stringent than those in the draft permit which the State finds necessary" to assure compliance with, among other things, State water quality standards. See 40 C.F.R. § 124.53(e)(2), and shall also include "[a] statement of the extent to which each conditions of the draft permit can be made less stringent without violating the requirements of State law, including water quality standards". See 40 C.F.R. §124.53(e)(3).

However, when EPA reasonably believes that a State water quality standard requires a more stringent permit limitation than that reflected in a state certification, it has an independent duty under CWA §301(b)(1)(C) to include more stringent permit limitations. See 40 C.F.R. §122.44(d)(1) and (5). It should be noted that under CWA § 401, EPA's duty to defer to consideration of state law is intended to prevent EPA from relaxing any requirements, limitations, or conditions imposed by State law. Therefore, "[a] State may not condition or deny a certification on the grounds that State law allows a less stringent permit condition." See 40 C.F.R. §12455(c). In such an instance, the regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 C.F.R. §122.4(d) and 40 C.F.R. §122.44(d).

In accordance with the regulations found at 40 C.F.R. Section 131.12, MassDEP has developed and adopted a statewide anti-degradation policy to maintain and protect existing in-stream water quality. The Massachusetts Anti-Degradation Policy is found at Title 314 CWR 4.04. No lowering of water quality is allowed, except in accordance with the anti-degradation policy. All existing uses of the Chicopee River, Ware River, and Quaboag River must be protected. This draft permit is being reissued with allowable discharge limits as, or more, stringent than those in the current permit and with the same parameter coverage. There is no change in outfall location. The public is invited to participate in the anti-degradation finding through the permit public notice process.

Under Section 301(b)(1) of the CWA, POTWs must have achieved effluent limitations based upon Secondary Treatment by July 1, 1977.

The secondary treatment requirements are set forth at 40 C.F.R. Part 133.102. In addition, Section 301(b)(1)(C) of the CWA requires that effluent limitations based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water.

2. Water Quality Standards; Designated Use; Outfall 027

The Palmer WWTF discharges into the Chicopee River approximately 300 feet downstream of the confluence of the Ware River and the Quaboag River. The treatment facility's discharge is approximately 2 (two) miles upstream of the Red Bridge Impoundment.

The Chicopee River, Quaboag River, and Ware River have been designated by the Massachusetts Surface Water Quality Standards, 314 Code of Massachusetts Regulations ("CMR") 4.05(4)(a) as Class B warm water fisheries and CSO impacted. These three rivers, located within the Chicopee River Watershed, eventually flow into the Connecticut River. The Massachusetts Surface Water Quality Standards, 314 CMR 4.05(3)(b) states that Class B waters are designated as habitat for fish, other aquatic life, wildlife, and for primary and secondary contact recreation. They shall be a source of public water supply (i.e., where designated and with appropriate treatment). They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses, and they shall have consistently good aesthetic value.

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

1) Unimpaired and not threatened for all designated uses; 2) Unimpaired waters for some uses and not assessed for others; 3) Insufficient information to make assessments for any uses; 4) Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) Impaired or threatened for one or more uses and requiring a TMDL.

The segment of the Chicopee River where the discharge occurs (segment MA36-22, extending from the confluence of the Ware and Quaboag Rivers to the Red Bridge Impoundment Dam) is classified in the State's 2008 Integrated List of Waters as Category 5, not in attainment and requiring a TMDL. The listed impairment for this segment is pathogens. The Chicopee River Watershed Water Quality Assessment Report of 2003 stated that the Palmer WWTF's CSO discharges are believed to have contributed to the elevated levels of pathogens in this segment of the Chicopee River. This report also stated that the Red Bridge Impoundment (MA36171) will no longer be reported as an approximately 73 acre lake segment, since the estimated retention time of this water body is approximately one day, and that it will be considered a run of the river impoundment (McVoy 2006).

a. Available Dilution

Water quality-based effluent limitations are established with the use of a calculated dilution factor, based on the available dilution of the effluent. Massachusetts water quality regulations require that the available effluent dilution be based upon the 7 year, 10 day low flow (7Q10 flow) of the receiving water (314 CMR § 4.03(3)(a)). The 7Q10 low flow is the mean low flow over seven consecutive days, recurring every ten years. Additionally, the 30-day, ten year low flow (30Q10 flow) of the receiving water is used in the calculation of water quality-based limitations for parameters such as ammonia (EPA 1999 Update of Ambient Water Quality Criteria for Ammonia).

The following statistical tools and stream flow gage data were used to generate data used to calculate the 7Q10 flow and dilution factor. (See also: **Attachment C** of this Fact Sheet, Sample Calculations.)

USGS – *StreamStats is a web-based tool that allows users to obtain stream flow statistics, drainage-basin characteristics, and other information for user-selected sites on streams* (i.e., http://water.usgs.gov/osw/streamstats/massachusetts.html). Streamstats was used to calculate the drainage area at the POTW.

USGS – gage flow data derived from the National Water Information System, Web Interface, http://ma.water.usgs.gov/water/default.htm.

The facility design flow is 5.6 million gallons per day (mgd) or 8.68 cubic feet per second (cfs). The 7Q10 flow data used in the calculation of water quality-based effluent limitations in the draft permit are based on stream flow collected by the United State Geological Survey (USGS). The nearest USGS stream flow gage station to the discharge point is located approximately 20 miles downstream of the facility at Indian Orchard, Massachusetts. The calculation of the dilution factor is shown below:

USGS StreamStats for MA	Drainage area at plant	= 646 mile^2
USGS Gage # 01177000	Drainage area at Indian Orchard, MA	= 689 mile^2
Drainage area ratio	(646 cfs / 689 cfs)	= 0.94
USGS Gage # 01177000	7Q10 at Indian Orchard, MA	= 128 cfs
(7Q10 at Indian)(D.A. ratio)	(128 cfs)(0.94)	= 120.3 cfs
Plant flow (Q) in cfs	(5.6 mgd)(1.55 converts to cfs)	= 8.68 cfs
Dilution Factor (DF)	$\frac{(7Q10) + (Plant\ Q)}{(Plant\ Q)} = \frac{(120\ cfs) + (8.68\ cfs)}{(8.68\ cfs)}$	= **14.8**

The receiving water 7Q10 and dilution factor used to calculate the water quality-based effluent limitation in the current permit were 81.8 cfs and 10.4 respectively. The calculations in this fact sheet yielded an increased 7Q10, which resulted in an increase in the dilution factor. The basis for the 7Q10 in the current permit was not well documented, so the reason for the difference is not clear. EPA is confident that the values derived in this fact sheet are correct and have used them to calculate water quality-based effluent limits.

3. Explanation of Effluent Limitations (Outfall 027)

In addition to the State and Federal regulations described above, data submitted by the permittee in its permit application, in monthly discharge monitoring reports (DMRs) and in whole effluent toxicity (WET) test reports from 2004 to 2008 was used to evaluate the discharge during the effluent limitations development process (see **Attachments A, B, and C**).

a. Flow

The average monthly flow limitation of 5.6 MGD in the current permit has been maintained in the draft permit. Federal regulations found at 40 CFR §122.45(b)(i) require that effluent limitations be calculated based on design flow, which is found in the Permit Application Form 2A, Part A, Section a.6. Flow will be measured continuously. The permittee will report the annual average monthly flow using the rolling average method (See Permit, Footnote 2). Additionally, the permittee will report the average monthly and maximum daily flow.

b. Conventional Pollutants

1. Biochemical Oxygen Demand (BOD)

The draft permit includes proposed average monthly and average weekly concentration (mg/l) and mass (lb/day) limitations, and an average monthly percent removal limitation, all based on the requirements set forth at 40 CFR § 133.102(a)(1), (2), (3), and 40 CFR § 122.45(f). The draft permit also includes maximum daily monitoring requirements based on current state water quality certification requirements.

The average monthly and average weekly mass limitations for BOD were calculated as follows:

Mass Limitation (lbs/day) = C x DF x 8.34

Where:
C = Concentration limit
DF = Design flow of the facility, in million gallons per day (MGD)
8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

Average Monthly Mass Limit = 30 mg/l x 5.6 MGD x 8.34 = 1400 lbs/day
Average Weekly Mass Limit = 45 mg/l x 5.6 MGD x 8.34 = 2100 lbs/day

The mass limitations in the draft permit are the same as those in the current permit and are consistent with anti-backsliding requirements.

2. Total Suspended Solids (nonfilterable) (TSS)

The draft permit includes proposed average monthly and average weekly concentration (mg/l) and mass (lb/day) limitations, and an average monthly percent removal limitation, all based on the requirements set forth at 40 CFR § 133.102(a)(1), (2), (3), and 40 CFR § 122.45(f). The draft permit also includes maximum daily monitoring requirements based on current state water quality certification requirements.

The average monthly and average weekly mass limitations for TSS were calculated as follows:

Mass Limitation (lbs/day) = C x DF x 8.34

Where:
C = Concentration limit
DF = Design flow of the facility, in million gallons per day (MGD)
8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

Average Monthly Mass Limit = 30 mg/l x 5.6 MGD x 8.34 = 1400 lbs/day
Average Weekly Mass Limit = 45 mg/l x 5.6 MGD x 8.34 = 2100 lbs/day

The mass limitations in the draft permit are the same as those in the current permit and are consistent with anti-backsliding requirements.

3. pH

The draft permit includes pH limitations which are protective of pH water quality criteria set forth at Title 314 CMR 4.05(b)(3), for Class B waters. The pH requirements are more stringent than

those required under 40 CFR § 133.102(c). The pH limits are carried forward from the current permit, and so are consistent with antibacksliding requirements of 40 CFR § 122.44(1). The monitoring frequency for pH is set at once per day in the draft permit.

4. *Escherichia Coli Bacteria (E. coli)*

The *Escherichia Coli (E. coli)* limits for outfall 027 are based on state water quality standards for Class B waters (314 CMR 4.05(b)(4)). The State of Massachusetts recently (December 29, 2006) promulgated new bacteria criteria in the Surface Water Quality Standards (314 CMR § 4.00). The *E. coli* bacteria limits proposed in the draft permit for Outfall 027 are a monthly geometric mean of 126 cfu per 100 ml and a maximum daily discharge of 409 cfu per 100 ml (this is the 90% distribution of the geometric mean of 126 cfu per 100 ml). The *E. coli* bacteria limits are seasonal, in effect from April 1st – October 31st, and will ensure the protection of receiving water recreational uses. The proposed *E. coli* bacteria monitoring frequency in the draft permit is twice per week. The draft permit includes a requirement to collect bacteria samples concurrently with a total residual chlorine sample.

c. Non-Conventional Pollutants

1. Nitrogen

It has been determined that excessive nitrogen loadings are causing significant water quality problems in Long Island Sound, including low dissolved oxygen. In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a Total Maximum Daily Load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a Waste Load Allocation (WLA) for point sources and a Load Allocation (LA) for non-point sources.

The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL.

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

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

1. Estimated loading from TMDL, (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound," April 1998).

2. Reduction of 25% from baseline loading.
3. Estimated current loading from 2004 – 2005 DMR data – detailed summary attached as **Exhibit A**.

The TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met, and the overall loading from MA, NH and VT wastewater treatment plants discharging to the Connecticut River watershed has been reduced by about 36 percent.

In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25 percent reduction over baseline loadings, EPA intends to include a permit condition for all existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization efforts will also be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that the aggregate 25 % reduction is maintained. Such a requirement has been included in this permit. We also intend to work with the State of Vermont to ensure that similar requirements are included in its discharge permits.

Specifically, the draft permit requires an evaluation of alternative methods of operating the existing wastewater treatment facility in order to control total nitrogen levels, including, but not limited to, operational changes designed to enhance nitrification (seasonal and year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. This evaluation is required to be completed and submitted to EPA and MassDEP within one year of the effective date of the permit, along with a description of past and ongoing optimization efforts. The draft permit also requires implementation of optimization methods sufficient to ensure that there is no increase in total nitrogen compared to the existing average daily load. The annual average total nitrogen load from this facility (2004 – 2005) is estimated to be 541 lbs/day. The draft permit requires annual reports to be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years. The draft permit also includes average monthly and maximum daily reporting requirements for total nitrogen (TN), ammonia nitrogen, total Kjeldahl nitrogen (TKN), total nitrite nitrogen (NO_2), and total nitrate nitrogen (NO_3) at a sampling frequency of once per week in the effluent.

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

2. Phosphorus

While phosphorus is an essential nutrient for the growth of aquatic plants, it can stimulate rapid plant growth in freshwater ecosystems when it is present in high quantities. The excessive growth of aquatic plants and algae within freshwater systems negatively impacts water quality and can interfere with the attainment of designated uses by: (1) increasing the oxygen demand within the water body (to support an increase in both plant respiration and the biological breakdown of dead organic (plant) matter); (2) causing an unpleasant appearance and odor; (3) interfering with navigation and recreation; (4) reducing water clarity; and (5) reducing the quality and availability of suitable habitat for aquatic life. Cultural (or accelerated) eutrophication is the term used to describe dense and excessive plant growth in a water body that results from nutrients entering the system as a result of human activities. Discharges from municipal and industrial wastewater treatment plants, agriculture runoff, and stormwater are examples of human-derived (i.e., anthropogenic) sources of nutrients in surface waters.

The Massachusetts Water Quality Standards under 314 CMR § 4.05(5)(c) require that, unless naturally occurring, surface waters must be free from nutrients that cause or contribute to impairment of the existing or designated uses, and the concentration of phosphorus may not exceed site specific criteria developed in a TMDL. Nutrients are also prohibited in concentrations that would cause or contribute to cultural eutrophication. As discussed above, this segment of the Chicopee River appears on the Massachusetts 303(d) list for pathogens, and does not appear on the 303(d) list for nutrients.

In the absence of numeric criteria for phosphorus, EPA uses nationally-recommended criteria and other technical guidance to develop effluent limitations for the discharge of phosphorus. EPA has published national guidance documents which contain recommended total phosphorus criteria and other indicators of eutrophication. EPA's 1986 *Quality Criteria for Water* (the "Gold Book") recommends that in-stream phosphorus concentrations not exceed 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly into lakes or impoundments, and 0.025 mg/l within a lake or reservoir. For this segment of the Chicopee River, the 0.1 mg/l standard would apply for the following three areas: downstream of the discharge, where the Chicopee Rivers enters the Red Bridge Impoundment, and within the Red Bridge Impoundment - given the short hydraulic retention time of this impoundment.

More recently, EPA has released recommended Ecoregional Nutrient Criteria, established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published criteria represent conditions in waters within ecoregions that are minimally impacted by human activities, and thus free from the effects of cultural eutrophication. Palmer is located within Ecoregion XIV, Eastern Coastal Plains. The recommended total phosphorus criterion 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 (EPA December 2000) is 24 ug/l (0.024 mg/l).

EPA has decided to apply the Gold Book criterion because it was developed from an effects-based approach versus the reference conditions-based approach used in the derivation of the ecoregion criteria. The effects-based approach is preferred in this case because it is more directly associated with an impairment of designated use (e.g., fishing). The effects-based approach provides a threshold value above which water quality impairments are likely to occur. It applies empirical observations of a causal variable (i.e., phosphorus) and a response variable (i.e., algal growth) associated with impairment of designated uses. Reference-based values are statistically derived from a comparison within a population of rivers in the same ecoregional class. They are

a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

Elevated concentrations of chlorophyll a, excessive algal and macrophyte growth, and low levels of dissolved oxygen are all effects of nutrient enrichment. The relationship between these factors and high in-stream total phosphorus concentrations is well documented in scientific literature, including guidance developed by EPA to address nutrient over-enrichment (Nutrient Criteria Technical Guidance Manual – Rivers and Streams. (EPA July 2000 [EPA-822-B-00-002]).

According to the 2003 Chicopee River Water Quality Assessment Report, aquatic vegetation, periphyton and phytoplankton, was unobservable or absent in the receiving water segment. Sampling data from the 2003 Water Quality Assessment Report also reported five summer in-stream phosphorus concentrations collected at Station CH01, located about one quarter of a mile downstream of the wastewater treatment facility discharge, near the intersection of New Hampshire Avenue and Springfield Street in Palmer, MA. The results were as follows: 31 ug/l, 33 ug/l, 64 ug/l, 51 ug/l, and 49 ug/l. Sampling data was also collected in 2008, and the results were as follows: 29 ug/l, 70 ug/l, 31 ug/l, 62 ug/l, 37 ug/l. These results are all less than the Gold Book criteria of 0.1 mg/l for free flowing segments. Although the data indicates that this segment meets the 100 ug/l Gold Book criterion and is in attainment for nutrients, the following calculation was made to ensure that the 100 ug/l criteria is achieved under 7Q10 low flow conditions..

Some natural attenuation of phosphorus will occur in the approximately one and a half miles between the sampling point and the Red Bridge Impoundment, and as noted previously, this impoundment has a short hydraulic retention time of one day. Available guidance (Nutrient Criteria Technical Guidance Manual – Lakes and Reservoirs (EPA April 2000 [EPA-822-B-00-001]) indicates that the hydraulic retention time of a water body is an important factor in determining the appropriate total phosphorus criteria. Specifically, this guidance document states that, for the purpose of this document, lakes are defined as natural and artifical impoundments with a surface area greater than 10 acres and a mean water residence time of 14 or more days. Therefore, for a detention time of one day, achieving the more stringent Gold Book criteria for lakes and reservoirs of 25 ug/ l may not be necessary.

The MassDEP Water Quality Survey conducted in 2008 in the Red Bridge Impoundment reported nine summer in-stream chlorophyll a concentrations that were as follows: 2.1 ug/l, 2 ug/l, 2.1 ug/l, 3.3 ug/l, 1.4 ug/l, 1.4 ug/l, 1.9 ug/l, 1.6 ug/l, and 1.7 ug/l. All of these values are below the Ecoregional nutrient criteria of 3.75 ug/l. A visual inspection at the sampling station reported no floating, emergent, or submerged aquatic plants, and only sparse algae was observed for the overall 73 acre impoundment. Since all of the dissolved oxygen samples that were collected at the surface within the Red Bridge Impoundment were above the 5.0 ug/l criterion, and all of the total phosphorus samples collected were below the 100 ug/l water quality criterion, this indicates that there is not excessive eutrophication within this impoundment.

A sample was collected approximately one third of a mile upstream from the discharge point, in the Quaboag River during a period that was nearly at 7Q10. This sample was collected on July 22, 2008, and the result was a total phosphorus concentration of 33 ug/l. Assuming that this instream concentration represents the concentration of the combined Ware River and Quaboag River flow upstream of the facility, a permit limit for phosphorus can be calculated as follows:

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

Where:

Q_R = 7Q10 flow of the Chicopee River = 120.3 cfs
Q_W = Design flow of the Palmer WWTF = 8.68 cfs
C_W = In-stream water quality criteria = 100 ug/l
C_R = In-stream phosphorus concentration located upstream of the discharge = 33 ug/l
C_W = Phosphorus concentration limit for the Palmer WWTF

{(120.3 + 8.68) * 100 – (120.3 * 33)} / 8.68 = 1028.58 ug/l = 1.0 mg/l

The calculation above indicates that the current monthly average total phosphorus limit of 1 mg/l is protective of water quality standards at the point of discharge. The draft permit therefore includes a 1.0 mg/l monthly average effluent limitation, for the period of May through October, during the algal growing season. If additional data or the completion of a Total Maximum Daily Loading (TMDL) indicates the need for more stringent limits, EPA and the MassDEP may exercise the re-opener clause of Part II.A. 4. of this permit and modify the phosphorus numerical limits. The existing average monthly and maximum daily reporting requirements are also maintained.

The draft permit also includes a monthly average phosphorus limit of 1.0 mg/l for the period from November through March. This limit on total phosphorus is necessary to ensure that phosphorus discharged during the winter period does not accumulate in the sediments downstream of the discharge. The limitation assumes that the vast majority of the phosphorus discharged will be in the dissolved fraction and that dissolved phosphorus will pass through the system given the twenty-four hour detention time of the downstream impoundment and the lack of plant growth during the winter period. The monitoring frequency for ortho-phosphorus for the winter period has been changed from once per week to once per month, in order to be consistent with the phosphorus sampling requirements.

d. Toxics Control

1. Total Residual Chlorine (TRC)

Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. In its water quality standards, the MassDEP has adopted the numeric criteria for chlorine that are recommended by EPA in *National Recommended Water Quality Criteri:2002* published by EPA pursuant to Section 304(a) of the Clean Water Act (See: 314 CMR 4.05(5)(e)). The numeric aquatic life criteria for total residual chlorine are 11 ug/l (chronic) and 19 ug/l (acute). The draft permit includes revised total residual chlorine limitations based on the following calculations:

Given:
Acute Chlorine WQS = 19 ug/l
Chronic Chlorine WQS = 11 ug/l

Total Residual Chlorine Limitations:
Maximum Daily TRC Limit = (acute criteria x dilution factor)
= (19 ug/l x 14.8)
= 281.2 ug/l = 0.28 mg/l

Monthly Average TRC Limit = (chronic criteria x dilution factor)
= (11 ug/l x 14.8)
= (162.8 ug/l = 0.16 mg/l

The maximum daily and monthly average TRC limits have been revised based on the updated dilution factor. The maximum daily limit increased from 0.2 mg/l to 0.28 mg/l and the average monthly limit increased from 0.11 mg/l to 0.16 mg/l. The season that the TRC limitations and monitoring requirements are in effect has been extended in the draft permit from April 1st - October 15th to April 1st – October 31st based on state certification requirements, and in order to be consistent with other NPDES permits within the Chicopee River Basin. The TRC limitations are also sufficiently stringent to meet the state's antidegradation policy because the receiving water will meet water quality standards and will not cause any adverse impact to the existing uses. These limits are also in accordance with antibacksliding regulations at 40 CFR Part 122.44 (l)(2)(i)(B)(1), which states that a permit may be re-issued with less stringent limits if there is information available which was not available at the time of permit issuance (i.e., in this case the updated 7Q10 of the receiving water is new information). Also, the three-per-day monitoring frequency for TRC in the current permit has been proposed for the draft permit. The draft permit requires that twice per week bacterial samples be collected with two of the TRC samples.

2. Metals (Aluminum, Copper, Lead, and Zinc)

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 site-specific criteria are established.

In evaluating the reasonable potential for the Palmer WWTF discharge to cause or contribute to an excursion above any State water quality standard for a particular metal, a permissible effluent concentration was calculated based on an allowable receiving water concentration (criteria) and the available dilution at the point of discharge. The following equation was used in the calculation of an allowable concentration of a particular metal in the effluent:

$C_d = C_r \times DF$

Where:

C_d = Allowable concentration of a particular pollutant in the effluent.
C_r = Allowable in-stream concentration of a pollutant.
DF = Dilution factor (available dilution at the point of discharge).

Metals data submitted by the permittee along with the results of chemical analyses performed in conjunction with the whole effluent toxicity (WET) tests from September 2004 – September 2007 (see **Attachment A**) were then compared to the calculated allowable effluent concentration. If the effluent monitoring data revealed discharges of a particular metal in concentrations exceeding the calculated allowable effluent concentration, then reasonable potential exists for this discharge to cause or contribute to an excursion above a State water quality standard. In this case, a limit equal to the allowable effluent concentration would be incorporated into the permit. The process used to determine whether or not an effluent limitation for aluminum, copper, lead, and zinc will be necessary in the draft permit, is illustrated in the following sections.

Aluminum

The following criteria from the EPA 2002 National Recommended Water Quality Criteria were used in the calculation of permissible effluent concentrations of aluminum:

Criterion Maximum Concentration (CMC) = 750 ug/l
Criterion Chronic Concentration (CCC) = 87 ug/l

Using the above criteria and the calculated dilution factor of 14.8, the allowable concentrations of aluminum that can be discharged from the Palmer WWTF into the receiving water was determined as follows:

Allowable Acute Effluent Concentration

C_d = CMC x DF = 750 ug/l x 14.8 = 11100 ug/l = 11.1 mg/l

Allowable Chronic Effluent Concentration

C_d = CCC x DF = 87 ug/l x 14.8 = 1287.6 ug/l = 1.3 mg/l

A review of monthly discharge monitoring reports (DMRs) submitted by the permittee from October 2004 to November 2007 found concentrations of aluminum in the effluent ranging from a minimum of 0 mg/l to a maximum of 0.84 mg/l, and an average concentration of 0.344 mg/l. And a review of WET test reports submitted by the permittee from September 2004 to December 2008 found concentrations of aluminum in the effluent ranging from a minimum of 0.12 mg/l to a maximum of 0.734 mg/l, and an average concentration of 0.326 mg/l. Because these concentrations are below the calculated allowable effluent concentrations, no reasonable potential exists for this discharge to cause or contribute to an exceedance of water quality criteria and effluent limitations for aluminum are not proposed in the draft permit. This proposed change is in accordance with the state's antidegradation policy because the receiving water will meet water quality standards and will not cause any adverse impact to the existing uses, and is in accordance with antibacksliding regulations at 40 CFR Part 122.44 (l)(2)(i)(B)(1) since the most recent effluent data and updated 7Q10 was not available at the time of the permit issuance. The permittee will continue to monitor aluminum as part of their whole effluent toxicity (WET) testing. Also, it is suggested that the facility try to minimize the amount of aluminum in their effluent while implementing the process used to meet the proposed phosphorus limits - because if the effluent values exceed the allowable acute or chronic concentration values, the permit may be modified to include aluminum limits.

Hardness-dependent Metals (Copper, Lead, and Zinc)

The water quality criteria for copper, lead, and zinc are dependent upon the hardness of the water in which the criteria are being applied. Increasing hardness of the water acts to reduce the toxicity of these metals.

An in-stream hardness value of 31.2 mg/l was used in the calculation of acute and chronic water quality criteria for copper, lead, and zinc. This value is the average of the in-stream hardness values of samples collected in the Chicopee River upstream from the discharge for use as dilution water for the August 2006 and August 2007 whole effluent toxicity tests (see **Attachment C**). Hardness values of samples collected during these months were used, since these are the months when the receiving water typically experiences the lowest flows. Therefore, the results are more representative of critical low-flow conditions.

Copper

The following equations from the EPA 2002 National Recommended Water Quality Criteria were used to determine acute and chronic copper criteria for the receiving water:

1. Acute Criteria $_{(Dissolved)} = \exp\{m_a[\ln(h)]+b_a\}(CF)$[1]

Where:

CF = Pollutant-specific conversion factor used to convert total recoverable metals to dissolved metals.

m_a = Pollutant-specific coefficient
b_a = Pollutant-specific coefficient
ln = Natural logarithm
h = Hardness of the receiving water, expressed in terms of mg/l $CaCo_3$

2. Chronic Criteria $_{(Dissolved)} = \exp\{m_c[\ln(h)]+b_c\}(CF)$

Where:

CF = Pollutant-specific conversion factor used to convert total recoverable metals to dissolved metals.

m_c = Pollutant-specific coefficient
b_c = Pollutant-specific coefficient
ln = Natural logarithm
h = Hardness of the receiving water, expressed in terms of mg/l $CaCo_3$

Once pollutant-specific water quality criteria were calculated, allowable acute and chronic effluent concentrations were calculated by multiplying the criteria by the available dilution as follows:

Calculation of Acute Water Quality Criteria and Allowable Effluent Concentration for Copper:

$m_a = 0.9422$ $b_a = -1.700$ CF = 0.960 h = 31.2

Acute Criteria $_{(Dissolved)} = e^{\{(0.9422 * \ln 31.2) + (-1.7)\}} \times (CF)$
= 4.67 x (CF)
= 4.67 x (0.960)
= 4.48 ug/l

Acute Criteria $_{(Total\ Recoverable)}$ = 4.48 ug/l / 0.960 = 4.667 ug/l

Dilution Factor = 14.8
Acute Allowable Concentration $_{(Dissolved)}$ = 4.48 ug/l x 14.8 = 66.3 ug/l = 0.066 mg/l
Acute Allowable Concentration $_{(Total\ Recoverable)}$ = 4.667 ug/l x 14.8 = 69.1 ug/l = 0.069 mg/l

[1] EPA Metal Translator Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criteria (EPA-823-B96-007) was used as the basis for the use of the criteria conversion factor (CF). National Guidance requires that permit limits for metals are to be expressed in terms of total recoverable metal and not dissolved metal. As such, conversion factors are used to develop total recoverable limits from dissolved criteria. The conversion factor reflects how the discharge of a particular metal partitions between the particulate and dissolved form after mixing with the receiving water. In the absence of site-specific data describing how a particular discharge partitions in the receiving water, a default assumption equivalent to the criteria conversion factor is used in accordance with the Metal Translator Guidance.

Calculation of Chronic Water Quality Criteria and Allowable Effluent Concentration for Copper:

$m_c = 0.8545$ $b_c = -1.702$ CF = 0.960 h = 31.2

Chronic Criteria $_{(Dissolved)} = e^{\{(0.8545 * \ln 31.2) + (-1.702)\}}$ x (CF)
= 3.445 x (CF)
= 3.445 x (0.960)
= 3.307 ug/l

Chronic Criteria $_{(Total\ Recoverable)}$ = 3.307 ug/l / 0.960 = 3.445 ug/l

Dilution Factor = 14.8
Chronic Allowable Concentration $_{(Dissolved)}$ = 3.307 ug/l x 14.8 = 48.94 ug/l = 0.049 mg/l
Chronic Allowable Concentration $_{(Total\ Recoverable)}$ = 3.445 ug/l x 14.8 = 50.9 ug/l = 0.050 mg/l

A review of monthly discharge monitoring reports (DMRs) submitted by the permittee from October 2004 to November 2007 found concentrations of copper in the effluent ranging from a minimum of 0 mg/l to a maximum of 0.045 mg/l, and an average concentration of 0.024 mg/l. And a review WET test reports submitted by the permittee from September 2004 to December 2008 found concentrations of copper in the effluent ranging from a minimum of 0.015 mg/l to a maximum of 0.055 mg/l, and an average concentration of 0.026 mg/l (see **Attachment A**). Since the facility's discharge data indicates that the facility has a reasonable potential to cause or contribute to a violation of the calculated allowable chronic concentration value, effluent limitations for copper are proposed in the draft permit. The proposed copper limitations are in accordance with the state's antidegradation policy, because the receiving water will meet water quality standards and will not cause any adverse impact to the existing uses. The limits are also in accordance with antibacksliding regulations at 40 CFR Part 122.44 (l)(2)(i)(B)(1), since the updated 7Q10 was not available at the time of the current permit's issuance.

The Massachusetts Surface Water Quality Standards were revised in December 2006 to include site-specific criteria that were developed for receiving waters where national criteria are invalid due to site-specific physical, chemical, or biological considerations, and do not exceed the safe exposure levels determined by toxicity testing (314 CMR 4.05(5)(e) Table 28). EPA approved these criteria on March 26, 2007. The MassDEP has not adopted site-specific copper criteria for the Chicopee River. If the MassDEP adopts new criteria for the effluent's receiving water, and if EPA approves, the permit may be re-opened and modified in order to reflect this change.

Lead

The following equations from the EPA 2002 National Recommended Water Quality Criteria were used to determine acute and chronic lead criteria for the receiving water:

1. Acute Criteria $_{(Dissolved)} = \exp\{m_a[\ln(h)]+b_a\}(CF)$

2. Chronic Criteria $_{(Dissolved)} = \exp\{m_c[\ln(h)]+b_c\}(CF)$

Once pollutant-specific water quality criteria were calculated, allowable acute and chronic effluent concentrations were calculated by multiplying the criteria by the available dilution as follows:

Calculation of Acute Water Quality Criteria and Allowable Effluent Concentration for Lead:

$m_a = 1.273$ $b_a = -1.460$ CF = 1.46203 - [(ln h)(0.145712)] h = 31.2

Acute Criteria $_{(Dissolved)} = e^{\{(1.273 * \ln 31.2) + (-1.460)\}}$ x (1.46203-[(ln 31.2)(0.145712)])
= 18.53 x (0.961)
= 17.81 ug/l

Acute Criteria $_{(Total\ Recoverable)}$ = 17.81 ug/l / 0.961 = 18.53 ug/l

Dilution Factor = 14.8
Acute Allowable Concentration $_{(Dissolved)}$ = 17.81 ug/l x 14.8 = 263.6 ug/l = 0.264 mg/l
Acute Allowable Concentration $_{(Total\ Recoverable)}$ = 18.53 ug/l x 14.8 = 274.2 ug/l = 0.274 mg/l

Calculation of Chronic Water Quality Criteria and Allowable Effluent Concentration for Lead:

$m_c = 1.273$ $b_c = -4.705$ CF = 1.46203 - [(ln h)(0.145712)] h = 31.2

Chronic Criteria $_{(Dissolved)} = e^{\{(1.273 * \ln 31.2) + (-4.705)\}}$ x (1.46203-[(ln 31.2)(0.145712)])
= (0.7223) x (0.961)
= 0.6941 ug/l

Chronic Criteria $_{(Total\ Recoverable)}$ = 0.6941 ug/l / 0.960 = 0.7223 ug/l

Dilution Factor = 14.8
Chronic Allowable Concentration $_{(Dissolved)}$ = 0.6941 ug/l x 14.8 = 10.27 ug/l = 0.010 mg/l
Chronic Allowable Concentration $_{(Total\ Recoverable)}$ = 0.7223 ug/l x 14.8 = 10.69 ug/l = 0.011 mg/l

A review of WET test reports submitted by the permittee from September 2004 to December 2008 found concentrations of lead in the effluent ranging from a minimum of 0 mg/l to a maximum of 0.0026 mg/l, and an average concentration below the detection level of 0.001 mg/l (see **Attachment A**). These values are below the calculated allowable effluent concentrations, and therefore no reasonable potential exists for this discharge to cause or contribute to an exceedance of water quality criteria. Effluent limitations for lead are not proposed in the draft permit. The permittee will continue to monitor lead as part of their whole effluent toxicity (WET) testing.

Zinc

The following equations from the EPA 2002 National Recommended Water Quality Criteria were used to determine acute and chronic zinc criteria for the receiving water:

1. Acute Criteria $_{(Dissolved)} = \exp\{m_a[\ln(h)]+b_a\}(CF)$

2. Chronic Criteria $_{(Dissolved)} = \exp\{m_c[\ln(h)]+b_c\}(CF)$

Once pollutant-specific water quality criteria were calculated, allowable acute and chronic effluent concentrations were calculated by multiplying the criteria by the available dilution as follows:

Calculation of Acute Water Quality Criteria and Allowable Effluent Concentration for Zinc:

$m_a = 0.8473$ $b_a = 0.884$ CF = 0.978 h = 31.2

Acute Criteria $_{(Dissolved)} = e^{\{(0.8473 * \ln 31.2) + (0.884)\}}$ x (CF)
= 44.66 x (0.978)
= 43.68 ug/l

Acute Criteria $_{(Total\ Recoverable)}$ = 43.68 ug/l / 0.978 = 44.66 ug/l

Dilution Factor = 14.8
Acute Allowable Concentration $_{(Dissolved)}$ = 43.68 ug/l x 14.8 = 646.464 ug/l = 0.65 mg/l
Acute Allowable Concentration $_{(Total\ Recoverable)}$ = 44.66 ug/l x 14.8 = 660.968 ug/l = 0.66 mg/l

Calculation of Chronic Water Quality Criteria and Allowable Effluent Concentration for Zinc:

$m_c = 0.8473$ $b_c = 0.884$ CF = 0.986 h = 31.2

Chronic Criteria $_{(Dissolved)} = e^{\{(0.8473 * \ln 31.2) + (0.884)\}}$ x (CF)
= (44.66) x (0.986) = 44.03 ug/l

Chronic Criteria $_{(Total\ Recoverable)}$ = 44.03 ug/l / 0.986 = 44.66 ug/l

Dilution Factor = 14.8
Chronic Allowable Concentration $_{(Dissolved)}$ = 44.03 ug/l x 14.8 = 651.6 ug/l = 0.65 mg/l
Chronic Allowable Concentration $_{(Total\ Recoverable)}$ = 44.66 ug/l x 14.8 = 660.98 ug/l = 0.66 mg/l

A review of WET test reports submitted by the permittee from September 2004 to December 2008 found concentrations of zinc in the effluent ranging from a minimum of 0.025 mg/l to a maximum of 0.052 mg/l, and an average concentration below the detection level of 0.0356 mg/l (see **Attachment A**). These values are below the calculated allowable effluent concentrations, and therefore no reasonable potential exists for this discharge to cause or contribute to an exceedance of water quality criteria. Effluent limitations for zinc are not proposed in the draft permit. The permittee will continue to monitor zinc as part of their whole effluent toxicity (WET) testing.

3. Whole Effluent Toxicity

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts State Surface Water Quality Standards, found at 314 CMR § 4.05(5)(e),include the following narrative statements and require that EPA criteria established pursuant to Section 304(a)(1) 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 314 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, as well as industrial sources, contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Based on the potential for toxicity from domestic and industrial contributions, the state narrative water quality criterion, the level of dilution at the discharge location, and in accordance with EPA national and regional policy and 40 CFR § 122.44(d), the draft permit includes a whole effluent acute toxicity (lethal concentration to 50% of the test organisms, or LC_{50}) limitation and a chronic toxicity (no observed effluent concentration, or C-NOEC) monitoring requirement. (See also: *Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants*, 49 Fed. Reg. 9016, March 9, 1984, and EPA's *Technical Support Document for Water Quality-Based Toxics Control*, September, 1991.)

The Massachusetts Department of Environmental Protection's (MassDEP) Division of Watershed Management has a current toxics policy which requires toxicity testing for all major dischargers such as the Palmer WWTF (*Implementation Policy for the Control of Toxic Pollutants in Surface Waters*, MassDEP 1990). In addition, EPA feels that toxicity testing is required to assure that the synergistic effect of the pollutants in the discharge does not cause toxicity, even though the pollutants may be at low concentrations in the effluent. The inclusion of whole effluent toxicity limitations in the draft permit will assure that the Palmer WWTF does not discharge combinations of toxic compounds into the Chicopee River in amounts which would affect aquatic or human life.

Pursuant to EPA Region I Policy, and MassDEP's *Implementation Policy for the Control of Toxic Pollutants in Surface Waters* (February 1990), dischargers having a dilution ratio within the range of 10:1 – 20:1 are required to conduct acute toxicity testing four times per year – unless there are passing results over an extended period of time. Since the toxicity testing results for the Palmer WWTF have been passing for an extended period (i.e., September 2004 – present), the toxicity testing frequency has been changed to twice per year. There is also a requirement in the draft permit to increase the testing frequency to four times per year if a new significant industrial user (SIU) is added into the system. This requirement has been added in order to ensure that the new discharge does not cause or contribute to an in-stream water quality standard exceedance. In accordance with the above guidance, the draft permit includes an acute toxicity limit (LC_{50} of 100%). The permittee shall conduct the acute toxicity tests using the daphnid, *Ceriodaphnia dubia* (*C. dubia*), as the test species. Toxicity testing must be performed in accordance with the EPA Region I test procedures and protocols specified in **Attachment C** of the draft permit (Freshwater Acute Toxicity Procedure and Protocol), and the tests will be conducted two times a year.

EPA and the MassDEP may use the results of the toxicity tests and chemical analyses conducted by the permittee, required by the permit, as well as national water quality criteria, state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants.

VI. SLUDGE CONDITIONS

Section 405(d) of the Clean Water Act requires that EPA develop technical standards regarding the use and disposal of sewage sludge. On February 19, 1993, EPA promulgated technical standards. These standards are required to be implemented through permits. The conditions in the permit satisfy this requirement.

VII. INFILTRATION/INFLOW (I/I)

Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes or deteriorated joints. Inflow is extraneous flow that enters the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity and the efficiency of the treatment works and may cause bypasses of secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows (CSO) in combined systems.

The draft permit includes requirements for the permittee and co-permittees to control infiltration and inflow (I/I) into the separate sewer collection systems they own and operate. The permittee and co-permittees shall each develop an I/I removal program commensurate with the severity of I/I in the collection system. This program may be scaled down in sections of the collection system that have minimal I/I.

VIII. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

The standard permit conditions for "Proper Operation and Maintenance", set forth at 40 CFR § 122.41(e), require the proper operation and maintenance of permitted wastewater systems and associated facilities to achieve permit conditions. The requirements at 40 CFR § 122.41(d) impose a "duty to mitigate" upon the permittee and co-permittees, which requires that "all reasonable steps be taken to minimize or prevent any discharge violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment". EPA and the MassDEP maintain that an I/I removal program is an integral component to ensuring compliance with the requirements of the permit under the provisions at 40 CFR § 122.41(d) and (e).

General requirements for proper operation and maintenance, and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.D. and I.E. of the draft permit. These requirements include reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to separate sewer collection systems (combined sewers are not subject to I/I requirements) to the extent necessary to prevent SSOs and I/I related effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary.

IX. DEVELOPMENT OF LIMITATIONS FOR INDUSTRIAL USERS

The permittee is required to identify, in terms of character and volume of pollutants, any significant indirect dischargers into the POTW subject to pretreatment standards under section 307(b) of the Clean Water Act and 40 CFR Part 403.

X. INDUSTRIAL PRETREATMENT PROGRAM

The Palmer WWTF currently has an approved pretreatment program that it is required to administer under the authority granted under 40 CFR § 122.44(j), 40 CFR § 403 and Section 307 of the CWA. In accordance with 40 CFR § 403, the permittee is obligated to modify, if necessary, its pretreatment program plan, to be consistent with current Federal Pretreatment Regulations. The permittee is also required to implement its pretreatment program in accordance with the requirements found at 40 CFR Part 403 (General Pretreatment Regulations). These requirements are necessary to ensure continued compliance with the facility's NPDES permit and its sludge use or disposal practices. Those activities that the permittee must perform include, but

are not limited to, the following: (1) develop and enforce EPA-approved specific effluent limits (technically-based local limits); (2) issue industrial user discharge permits; (3) conduct compliance monitoring activities (e.g., sampling and inspections at industrial users); and (4) initiate enforcement actions against non-complying industrial users.

On October 14, 2005 EPA published in the Federal Register final changes to the General Pretreatment Regulations. The final "Pretreatment Streamlining Rule" is designed to reduce the burden to industrial users and provide regulatory flexibility in technical and administrative requirements of industrial users and POTWs. Within 60 days of the effective date of this permit, the permittee must submit to EPA all required modifications of the Streamlining Rule in order to be consistent with the provisions of the newly promulgated Rule. To the extent that the POTW legal authority is not consistent with the required changes, they must be revised and submitted to EPA for review.

Lastly, the permittee must submit an annual pretreatment report by **June 1st**, which describes the permittee's pretreatment program activities over its pretreatment reporting period of April 1st – March 31st.

XI. COMBINED SEWER OVERFLOWS (CSO)

1. Background

Combined sewer overflows (CSOs) are overflows from a combined sewer system that are discharged into receiving waters before reaching the headworks of a publicly owned treatment works (POTW). CSOs occur during precipitation events when the flow in the combined sewer system exceeds interceptor or regulator capacity. CSOs are distinguished from bypasses, which are "intentional diversions of waste streams from any portion of a treatment facility" (40 CFR 122.41(m)).

Flows in combined sewers can be classified as dry weather flow or wet weather flow. Wet weather flow is a combination of domestic, commercial, and industrial wastewater, groundwater infiltration, and storm water flow including snowmelt. Dry weather flow is the flow in a combined sewer that results from domestic, commercial, and industrial wastewater and groundwater infiltration with no contribution from storm water runoff or storm water induced infiltration.

CSOs are subject to the non POTW technology-based effluent limitation requirements found at Section 301 (b)(1)(A) of the Clean Water Act, rather than the POTW technology-based requirements found in Section 301(b)(1)(B). (See Montgomery Environmental Coalition vs. Costle, 646F.2d 568 (D.C. Cir 1980)). CSOs are also subject to effluent limitations based on water quality standards pursuant to Section 301(b)(1)(C) of the CWA.

On April 19, 1994 EPA published the National CSO Control Policy (59 FR 18688). The purpose of the Policy was to establish a consistent national approach for controlling discharges from CSOs to the Nation's waters. The Policy reiterates the goals of EPA's 1989 CSO Strategy, which are:

- To ensure that if the CSO discharges occur, they are only as a result of wet weather;
- To bring all wet weather CSO discharge points into compliance with the technology based requirements of the CWA and applicable federal and state water quality standards; and
- To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

To achieve these goals, the CSO Policy recommended that technology-based limitations be developed using best professional judgment (BPJ). The recommended limitations consisted of the following nine minimum controls:

1. Proper operation and regular maintenance programs for the sewer system and the CSOs;
2. Maximize use of the collection system for storage;
3. Review and modification of pretreatment requirements to assure CSO impacts are minimized;
4. Maximization of the flow to the POTW for treatment;
5. Prohibition of CSOs during dry weather;
6. Control of solid and floatable material in CSOs;
7. Pollution prevention;
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO control

The CSO Policy also recommended that each combined sewer system develop and implement a long-term CSO control plan (LTCP) that will ultimately result in compliance with the requirements of the Clean Water Act.

In 2001, Congress added Section 402(q) to the CWA to specifically address CSOs by stating that "Each permit, order, or decree issued pursuant to this Act after the date of enactment of this subsection for a discharge from a municipal combined storm and sanitary sewer shall conform to the Combined Sewer Overflow Control Policy signed by the Administrator on April 11, 1994."

The CSO conditions in the draft permit are consistent with the National CSO Control Policy.

2. Effluent Limits

The draft permit requires that CSOs discharges achieve technology-based limits. EPA has made a BPJ determination, consistent with the CSO Policy, that technology-based limits are the nine minimum controls. The draft permit requires the permittee to continue implementing the nine minimum controls as documented in its previous submissions, but also requires the permittee to evaluate and update its documentation within six months of the permit effective date to determine if there are modifications that can be made to its NMC program that will enhance its effectiveness. To ensure that each of the NMCs has an appropriate minimum implementation level, the permit specifies minimum implementation levels for each NMC. These levels must be included, at a minimum, in the permittee's nine minimum control program.

The draft permit also establishes narrative water quality–based limitations for CSOs, requiring that CSO discharges shall not cause or contribute to exceedances of water quality standards. As described in the following sections, the permittee has submitted a CSO interim control plan, and the schedule for implementing that plan will be included in an appropriate enforcement order.

3. Reporting

The draft permit requires the permittee to submit an annual report, by March 1, summarizing its implementation of the nine minimum controls during the previous calendar year. This report shall include:

• A summary of dry weather overflows that occurred during the year, including the location date, estimated duration and estimated flow, and a description of measures taken to stop and eliminate the dry weather overflows.

• A summary of CSO activations that occurred at each CSO during the year, including the date, estimated duration and estimated flow.

• A certification that the previous year's inspections have been conducted and records maintained.

4. Current CSO Status

EPA's national CSO policy ("CSO policy"), which was published in the Federal Register on April 19, 1994 (59 FR 18688), requires that permittees develop and submit a long-term CSO control plan which complies with the requirements of the CSO policy. The Town first submitted a CSO facilities plan in 1992. The plan has been updated several times. A final CSO facilities plan was submitted, and is titled "Final Long-Term CSO Control Plan and Final EIR", May 1999.

Schedules for implementing the required CSO abatement facilities are contained in a federal court order. The Town of Palmer has significantly reduced the number of active CSOs within its system. There were 21 active combined sewer overflows (CSOs) in the year 2000. Currently, there are only 6 CSOs that remain active.

The permit is conditioned to require an annual certification, no later than **January 15th** of each year, that states that all discharges from combined sewer outfalls were recorded, and other appropriate records and reports maintained for the previous calendar year.

The permit may be modified or reissued upon the completion of a long-term CSO control plan. Such modification may include performance standards for the selected controls, a post construction water quality assessment program, monitoring for compliance with water quality standards, and a reopener clause to be used in the event that the selected CSO controls fail to meet water quality standards. Section 301(b)(1)(C) requires that a permit include limits that may be necessary to protect water quality standards.

XII. SEPARATE SEWER REQUIREMENTS

1. Inflow/Infiltration

Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, and cross connections from storm water systems.

Significant I/I in a collection system may displace sanitary flow, reducing the capacity and the efficiency of the treatment works and may cause bypasses of the full treatment process. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows in combined systems.

As described earlier, the combined sewer system is being separated, which will significantly reduce flows to the treatment plant during wet weather. However, the facility reports high flows

during periods when there is no precipitation, indicating significant extraneous flows not attributable to storm water runoff.

The permit standard conditions for 'Proper Operation and Maintenance' are found at 40 CFR §122.41(e). These conditions require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. NPDES permittees also have a 'duty to mitigate' as stated in 40 CFR §122.41 (d). This requires permittees to take all reasonable steps to minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment. These regulations apply to the entire POTW, which is defined at 40 CFR 403.3, and includes "…any devices and systems used in the storage, treatment recycling, and reclamation of municipal sewage or industrial waste of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW treatment plant."

EPA and MassDEP maintain that an I/I removal program is an integral component of ensuring permit compliance under both of these provisions, MassDEP has required that I/I conditions be included in NPDES permits for POTWs as a conditions for receiving State Certification under Section 401 of the Clean Water Act and 40 CFR §124.55(b).

Accordingly, collection system operation and maintenance requirements have been included in the draft permit. The Towns of Belchertown and Monson have been made co-permittees to the specific parts of the permit related to operation and maintenance of the collection systems they own and operate. The specific sections of the draft permit are Part I.D, Unauthorized Discharges from the Sewer System and Part I.E, Operation and Maintenance, which include conditions regarding the operation and maintenance of the collection systems owned and operated by the Towns.

XIII. ESSENTIAL FISH HABITAT DETERMINATION (EFH)

Under the 1996 Amendments (PL 104-267) to the Magnusun-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et.seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (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" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, 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 CFR § 600.910(a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific of habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b)(1)(A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. The Chicopee, Quabog, and Ware Rivers are not covered by the EFH designation for riverine systems and thus EPA and the MassDEP have determined that a formal consultation with NMFS is not required.

XIV. ENDANGERED SPECIES ACT (ESA)

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

Section 7(a)(2) of the Clean Water Act requires every Federal agency in consultation with and with the assistance of the Secretary of the Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for freshwater species. EPA informally consulted with NMFS recently to determine whether there are any threatened or endangered species within an area that could be affected by the Palmer WWTF's discharge or the active CSOs listed in the draft permit. EPA and NMFS determined that a formal ESA consultation will not be required for these discharges, since there are no known threatened or endangered species or their critical habitat within the vicinity of the Palmer discharges.

The permittee should contact the State regarding a Massachusetts Natural Heritage and Endangered Species Program (NHESP) review.

XV. MONITORING AND REPORTING

The permittee is obligated to monitor and report sampling results to EPA and the MADEP within the time specified within the permit. Timely reporting is essential for the regulatory agencies to expeditiously assess compliance with permit conditions.

XVI. STATE PERMIT CONDITIONS

The NPDES Permit is issued jointly by the U. S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of the permit are, therefore, incorporated into and constitute a discharge permit issued by the Director of the Division of Watershed Management pursuant to M.G.L. Chap. 21, §43.

XVII. GENERAL CONDITIONS

The general conditions of the permit are based on 40 CFR Parts 122, Subparts A and D and 40 CFR § 124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

XVIII. OTHER MONITORING REQUIREMENTS

The effluent monitoring requirements have been specified in accordance with 40 CFR 122.41(j), 122.44(I) and 122.48 to yield data representative of the discharge.

XIX. STATE CERTIFICATION REQUIREMENTS

The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit. EPA has requested permit certification by the State pursuant to CWA § 401(a)(1) and 40 CFR § 124.53 and expects that the draft permit will be certified.

XX. PUBLIC COMMENT PERMIT, PUBLIC HEARING, 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 before the close of the public comment period, to the U.S.EPA, 5 Post Office Square – Suite 100, Municipal Permits Branch (OEP06-1), Boston, MA 02109-3912. Any person, prior to such date, may submit a request in writing to EPA and the state agency for a public hearing to consider the draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. 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 a 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. Permits may be appealed to the Environmental Appeals Board in the manner described at 40 CFR § 124.19.

XXI. EPA AND MASSDEP CONTACTS

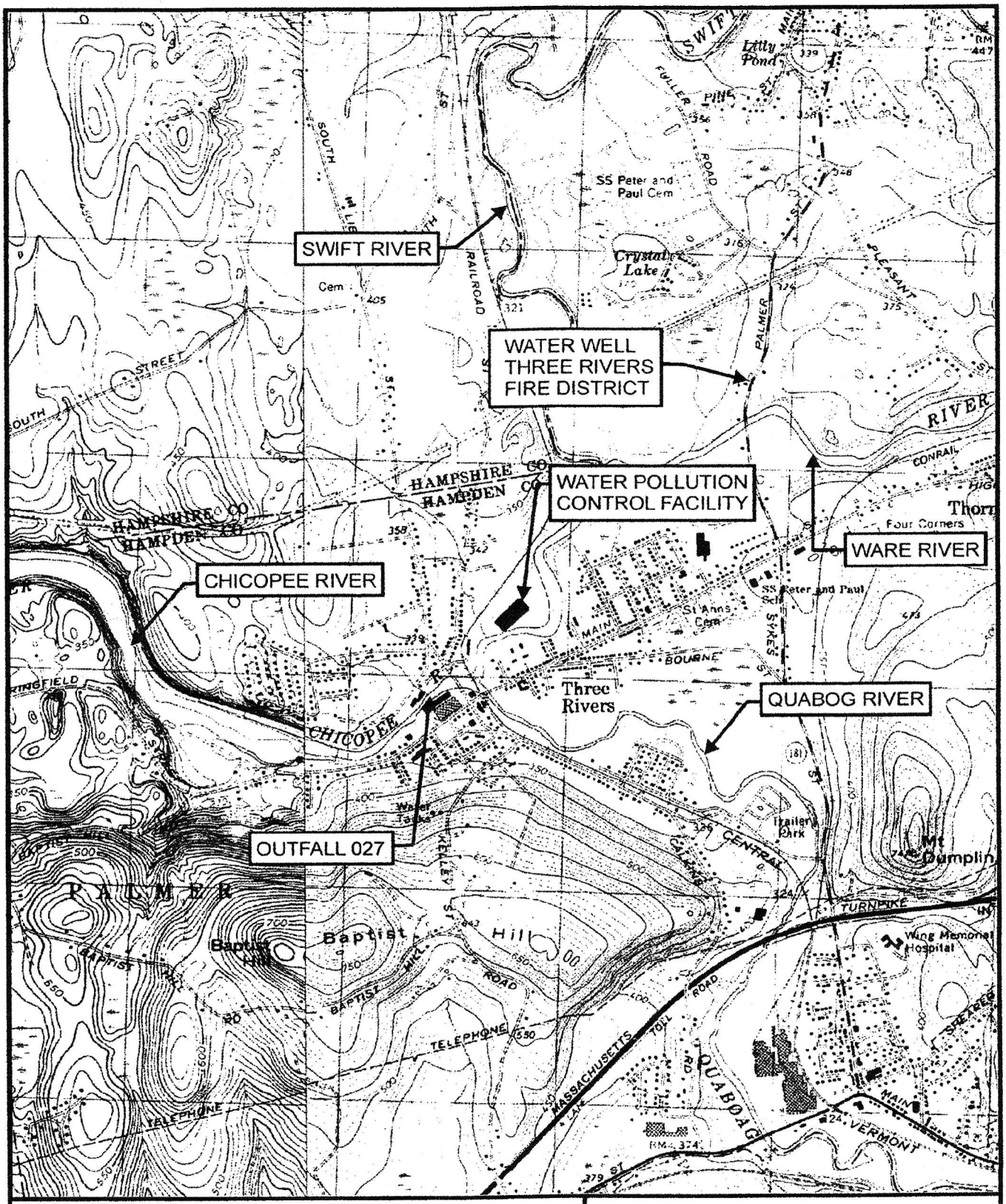
Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Janet Deshais
Chemical/Environmental Engineer
U.S. Environmental Protection Agency
5 Post Office Square – Suite-100
Mail Stop – OEP06-1
Boston, MA 02109-3912
Telephone: (617) 918-1667
E-mail: deshais.janet@epa.gov

Kathleen Keohane
Surface Water Permit Program
Division of Watershed Management
Department of Environmental Protection
627 Main Street, Second Floor
Worcester, MA 01608
Telephone: (508) 767-2856
E-mail: kathleen.keohane@state.ma.us

Date: _____
Stephen S. Perkins, Director*
Office of Ecosystem Protection
U.S. Environmental Protection Agency

*Please address all comments to Janet Deshais and Kathleen Keohane at the addresses above.



Based upon USGS topographic map for Palmer, MA Quadrangle
Published 1969
Photorevised 1979

MASS

Contour Interval 10 Feet

N NE E SE S SW W NW

Figure 1

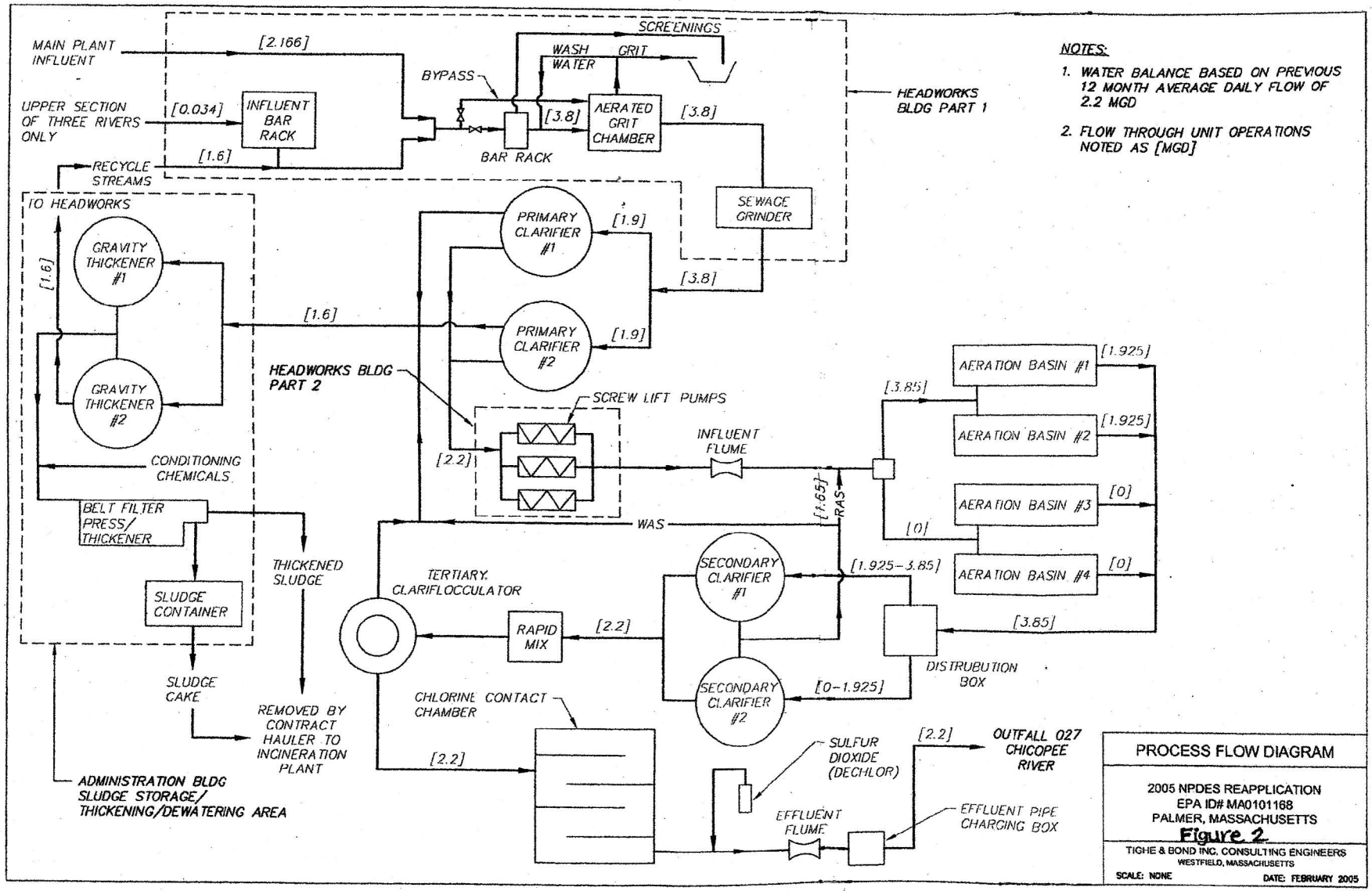
SITE LOCUS - PALMER WATER POLLUTION CONTROL FACILITY

2005 NPDES REAPPLICATION
EPA ID# MA0101168
PALMER WPCF
THREE RIVERS, MASSACHUSETTS

Tighe&Bond

SCALE: 1:25000 FEBRUARY 2005

FAGRAPHICS\P0084M OCUS.cdr



NOTES:

1. WATER BALANCE BASED ON PREVIOUS 12 MONTH AVERAGE DAILY FLOW OF 2.2 MGD
2. FLOW THROUGH UNIT OPERATIONS NOTED AS [MGD]

PROCESS FLOW DIAGRAM

2005 NPDES REAPPLICATION
EPA ID# MA0101168
PALMER, MASSACHUSETTS

Figure 2.

TIGHE & BOND INC. CONSULTING ENGINEERS
WESTFIELD, MASSACHUSETTS

SCALE: NONE DATE: FEBRUARY 2005

P0084/FIG2

ATTACHMENT A
EFFLUENT MONITORING DATA
NPDES Permit No. MA0101168
PALMER, MA

DESCRIPTION OF DISCHARGE: Advanced Wastewater Treatment Plant Effluent

DISCHARGE: Outfall 027 (The receiving water is the Chicopee River)

The discharge monthly reports for monthly average and daily maximum values listed below, were reported from October 2004 to November 2007 unless otherwise indicated.

EFFLUENT CHARACTERISTICS AT THE POINT OF DISCHARGE:

Parameter	Monthly Average (range)	Weekly Average (range)	Daily Maximum
Flow, MGD (annual average)	2.1 – 2.8	-----	-----
BOD, mg/l	3.8 – 18.2	5 – 30.3	-----
BOD, lb/day	62 – 319	91 – 499	-----
TSS, mg/l	1.1 – 5.1	1.35 – 6.8	-----
TSS, lb/day	13 – 159	18 – 245	-----
Total Chlorine Residual, mg/l	0 – 0.01	0 – 0.1	-----
pH, standard units	5.5 – 7.14 (minimum)	6.8 – 8.3 (maximum range)	
Total Fecal Coliform, cfu/100 ml	0 – 51.7 (Also, one TRC exceedance on 6/30/07 at 404 cfu/100 ml.)	0 – 230	-----
Total Phosphorus, mg/l			
May 1 – October 31	0.36 – 0.87	0.54 – 1.57	0.59 – 1.58
November 1 – April 30	0.34 – 1.41	-----	0.34 – 1.14
Total Nitrogen, Ammonia (as N), mg/l	1.2 – 27	-----	1.2 – 27
Total Nitrogen, Kjeldahl (as N), mg/l	0 – 23	-----	0 – 23
Total Nitrate, Ammonia (as N), mg/l	0.14 – 39	-----	0.14 – 39
Total Nitrite, Ammonia (as N), mg/l	0 – 6.8	-----	0 – 6.8
Aluminum, ug/l	0 – 840	-----	0 – 840
Copper, ug/l	0 – 45	-----	0 – 45

Whole Effluent Toxicity (WET) Tests submitted by the permittee from 9/1/04 until 9/10/07 were all passing results:

LC_{50} (Ceriodaphnia dubia) $\geq$ 100% (all 13 tests)
NOEL (Ceriodaphnia dubia) $\geq$ 100% (9 tests)
$\geq$ 50% (3 tests)
$\geq$ 25% (1 test)

Metals Chemistry Data:

Aluminum, ug/l	120 – 734
Copper, ug/l	15 – 55
Lead, ug/l	0 – 2.6
Zinc, ug/l	25 - 52

ATTACHMENT A – Continued;

Whole Effluent Toxicity: Test results submitted by the permittee from 9/11/07 until 12/31/08 were all passing results:

LC_{50} (Ceriodaphnia dubia) $\geq$ 100% (all 5 tests)

Nitrogen Load During 2004-2009:

Year	Total Nitrogen (mg/l)	Flow (MGD)	Nitrogen Load (lbs/day)
2009	32.85	2.0	555.9
2008	25.76	2.3	497.6
2007	29.49	1.9	470.2
2006	25.86	2.6	556.3
2005	29.23	2.5	567.4
2004	28.28	2.2	514.8

CSO Effluent Data (Number of Flow Activations):

Outfall Numbers:	008	018	21A	022	23A	23B
Activation Date:						
May-04	3	2	1	5	1	1
Jun-04	0	0	0	2	0	0
Jul04	3	3	1	5	2	1
Aug-04	3	3	1	3	1	1
Sep-04	3	3	2	3	2	3
Oct-04	0	1	0	1	0	0
Nov-04	2	2	0	2	0	0
Dec-04	1	1	0	2	1	1
Total	**15**	**15**	**5**	**23**	**7**	**7**
Jan-05	2	1	0	1	0	1
Feb-05	2	3	1	3	1	1
Mar-05	1	1	1	1	1	1
Apr-05	2	2	0	2	0	0
May-05	0	1	0	2	0	1
Jun-05	3	3	2	3	2	2
Jul-05	4	3	1	4	2	1
Aug-05	4	3	2	5	1	3
Sep-05	3	3	2	3	3	2
Oct-05	5	2	1	5	3	2
Nov-05	2	2	0	3	2	1
Dec-05	1	1	0	3	0	0
Total	**29**	**25**	**10**	**35**	**15**	**15**

ATTACHMENT A – Continued;

CSO Effluent Data (Number of Flow Activations):

Outfall Numbers:	008	018	21A	022	23A	23B
Activation Date:						
Jan-06	3	3	0	4	2	2
Feb-06	3	0	0	3	1	0
Mar-06	1	1	0	1	0	0
Apr-06	1	0	0	3	0	1
May-06	4	3	0	6	0	0
Jun-06	8	4	2	6	4	3
Jul-06	5	4	1	6	4	4
Aug-06	3	3	2	5	2	3
Sep-06	4	1	0	2	0	0
Oct-06	3	4	0	5	1	1
Nov-06	5	4	0	4	1	0
Dec-06	1	1	0	1	0	0
Total	**41**	**28**	**5**	**46**	**15**	**14**
Jan-07	1	0	0	2	0	0
Feb-07	1	0	0	0	0	0
Mar-07	2	2	0	3	0	1
Apr-07	2	2	0	3	0	1
May-07	3	1	1	3	1	1
Jun-07	6	5	0	5	1	1
Jul-07	8	4	3	5	3	3
Aug-07	5	3	0	3	1	1
Sep-07	0	2	0	2	1	1
Oct-07	2	3	0	4	1	0
Nov-07	1	1	0	2	1	0
Dec-07	0	0	0	0	0	0
Total	**31**	**23**	**4**	**31**	**9**	**8**
Jan-08	0	0	0	0	0	0
Feb-08	5	5	0	4	1	0
Mar-08	3	2	0	2	0	0
Apr-08	1	1	0	2	0	0
Total	**9**	**8**	**0**	**8**	**1**	**0**

ATTACHMENT B
INSTREAM MONITORING DATA
NPDES Permit No. MA0101168
PALMER, MA

Total Phosphorus, Upstream of the Palmer WWTF:

Total phosphorus samples were collected at the headwaters of the Chicopee River, approximately 300 feet upstream of the Palmer WWTF discharge. Two samples were collected four feet from the shoreline (i.e., one sample was collected from each side of the river). The total phosphorus sampling results are as follows:

Sampling Date:	Total Phosphorus (ug/l)
May 18, 2009	30
May 18, 2009	30

Total phosphorus samples were also collected during the spring and summer of 2008 at three different sites. The total phosphorus sampling results were as follows:

Sampling Date:	Total Phosphorus (ug/l):
Site WA12:	(Ware River)
(1.5 miles upstream)	
May 20, 2008	29
May 20, 2008	29
May 20, 2008	ND
June 17, 2008	ND
June 17, 2008	37
June 17, 2008	39
July 22, 2008	28
July 22, 2008	28
July 22, 2008	ND
August 19, 2008	ND
August 19, 2008	29
August 19, 2008	30
September 23, 2008	26
September 23, 2008	ND
September 23, 2008	27

Site QRO.08:	Total Phosphorus (ug/l):
(0.3 miles upstream)	(Quaboag River)
May 20, 2008	32
June 17, 2008	69
July 22, 2008	**33**
August 19, 2008	42
September 23, 2008	33

Site SRO2:	Total Phosphorus (ug/l):
(4.5 miles upstream)	(Swift River)
May 20, 2008	6
June 17, 2008	10
July 22, 2008	10
August 19, 2008	7
September 23, 2008	10

ATTACHMENT B, Continued;

Total Phosphorus, Downstream from the Palmer WWTF:

Samples were collected from the Chicopee River at approximately ½ mile downstream of the Palmer WWTF. The sampling location was near the intersection of New Hampshire Avenue and Springfield Street, and the samples were collected during the spring and summer of 2003 and in 2008. The total phosphorus sampling results are as follows:

Sampling Date:	Total Phosphorus (ug/l):	Instream Flow (ft3/s):
April 16, 2003	31	13 times 7Q10
May 14, 2003	33	7.6 times 7Q10
June 18, 2003	64	9 times 7Q10
July 30, 2003	51	2 times 7Q10
August 20, 2003	49	3.5 times 7Q10
Average	46	

Sampling Date:	Total Phosphorus (ug/l):	Instream Flow (ft3/s):
May 20, 2008	29	9.3 times 7Q10
June 17, 2008	70	5.2 times 7Q10
July 22, 2008	31	2.4 times 7Q10
August 19, 2008	62	7.6 times 7Q10
September 23, 2008	37	6.9 times 7Q10
Average	45.8	

Total Phosphorus, Downstream Impoundment Data:

Samples were collected at Site A which is a deep hole at the Red Bridge Impoundment, by the MassDEP during the summer of 2008. Site A is located in front of the left edge of the dam, facing downstream, and located at: latitude/longitude 42’10.563 N / 25’25.017 W. The total phosphorus sampling results are as follows:

Sampling Date:	Phosphorus Sampling Results:
July 10, 2008	At approximately 0.2 meters depth, phosphorus (total) = 36 ug/l, and 33 ug/l At approximately 12.2 meters depth, phosphorus(total) = 47 ug/l Therefore, total phosphorus monthly average, July = (116 /3) = 39 ug/l
August 25, 2008	At approximately 0.2 meters depth, phosphorus (total) = 26 ug/l, and 26 ug/l At approximately 12.2 meters depth, phosphorus(total) = 61 ug/l Therefore, total phosphorus monthly average, August = (113 /3) = 38 ug/l
September 15, 2008	At approximately 0.2 meters depth, phosphorus (total) = 33 ug/l, and 33 ug/l At approximately 12.2 meters depth, phosphorus(total) = 40 ug/l Therefore, total phosphorus monthly average, September = (106 /3) = 35 ug/l

ATTACHMENT B, Continued;

Dissolved Oxygen Sampling Results at Site A / Impoundment Data:

Sampling Date:	Start Time:	Sample Depth (meters):	Dissolved Oxygen (ug/l):
July 10, 2008	135903	0.5	7.51
July 10, 2008		1.5	7.03
July 10, 2008		3.0	6.53
July 10, 2008		5.0	6.29
July 10, 2008		6.5	5.7
July 10, 2008		7.0	4.71
July 10, 2008		8.1	0.22
July 10, 2008		9.5	0.02
July 10, 2008		11.5	0.00

Sampling Date:	Start Time:	Sample Depth (meters):	Dissolved Oxygen (ug/l):
July 10, 2008	124734	0.6	7.49
July 10, 2008		1.5	7.44
July 10, 2008		2.5	7.2
July 10, 2008		3.7	7.39
July 10, 2008		4.5	7.46
July 10, 2008		5.5	4.6
July 10, 2008		5.2	6.81

Sampling Date:	Start Time:	Sample Depth (meters):	Dissolved Oxygen (ug/l):
August 25, 2008	1202	0.48	8.77
August 25, 2008		2.04	8.13
August 25, 2008		3.57	7.91
August 25, 2008		5.06	7.48
August 25, 2008		7.96	6.10
August 25, 2008		9.05	5.9
August 25, 2008		9.94	5.10
August 25, 2008		10.98	2.38
August 25, 2008		11.7	0.89

Sampling Date:	Start Time:	Sample Depth (meters):	Dissolved Oxygen (ug/l):
August 25, 2008	1121	0.504	8.52
August 25, 2008		4.55	8.62

Sampling Date:	Start Time:	Sample Depth (meters):	Dissolved Oxygen (ug/l):
Sept. 15, 2008	12:03	0.559	8.95
Sept. 15, 2008		2.053	8.89
Sept. 15, 2008		4.01	8.88
Sept. 15, 2008		6.01	8.9
Sept. 15, 2008		7.979	8.92
Sept. 15, 2008		8.927	8.7
Sept. 15, 2008		10.107	7.86
Sept. 15, 2008		10.998	7.18
Sept. 15, 2008		12.035	5.56
Sept. 15, 2008		12.552	4.79

ATTACHMENT B, Continued;

Chlorophyll a Sampling Results at Site A / Impoundment Data:

Sampling Date:	Sample Depth (meters):	Chlorophyll a (ug/l):
July 10, 2008	surface	2.1
July 10, 2008	0-6	2.0
July 10, 2008	0-6	2.1
August 26, 2008	surface	3.3
August 26, 2008	0-6.5	1.4
August 26, 2008	0-6.5	1.4
September 15, 2008	surface	1.9
September 15, 2008	0-6	1.6
September 15, 2008	0-6	1.7

The Ecoregional chlorophyll a criterion is 3.75 ug/l. And since all of the sampling results are below the ecoregional criterion, the Red Bridge Impoundment meets the chlorophyll a water quality standard.

ATTACHMENT C
SAMPLE CALCULATIONS
NPDES Permit No. MA0101168
PALMER, MA

Plant Design Flow = 5.6 MGD
= (5.6 MGD) x (1.55 converts to cfs)
= 8.68 cfs

Instream 7Q10 = 120.3 cfs

Dilution Factor = (Instream 7Q10 + Design Flow) / Design Flow
= (120.3 cfs + 8.68 cfs) / 8.68 cfs
= 14.8 (Low Risk Toxicity - Acute Limit Only)

Hardness of the Chicopee River = 31.2 mg/l
(sampled at a nearby location, upstream of the discharge, during low flow in August 2006 and 2007.)

Total Residual Chlorine Limits (TRC):
Acute (Maximum Daily) = (acute criteria x dilution factor) = (19 ug/l x 14.8)= 281.2 ug/l = 0.28 mg/l
Chronic (Monthly Average) = (chronic criteria x dilution) = (11 ug/l x 14.8) = 162.8 ug/l = 0.16 mg/l

Biochemical Oxygen Demand (BOD) Limits:
Average Monthly Concentration Limit = 30 mg/l
Average Weekly Concentration Limit = 45 mg/l

Total Suspended Solids (TSS) Limits:
Average Monthly Concentration Limit = 30 mg/l
Average Weekly Concentration Limit = 45 mg/l

Total Phosphorus Seasonal Limit (May 1 - October 31):
Average Monthly = 1.0 mg/l (i.e., based on water quality standards and anti-backsliding regulations.)
Average Weekly = 2.0 mg/l (i.e., based on water quality standards and anti-backsliding regulations.)

Aluminum Limits:
Acute Aluminum Limit = (acute criteria x dilution factor) = (750 ug/l x 14.8) = 11100 ug/l
Chronic Aluminum Limit = (chronic criteria x dilution factor) = (87 ug/l x 14.8) = 1288 ug/l

Copper Limits:
Copper is dependent on the hardness of the receiving water.
Acute Copper Limit = $e^{(0.9422 * \ln 31.2) + (-1.7)}$ x dilution factor = (4.667 ug/l x 14.8) = 69.1 ug/l
Chronic Copper Limit = $e^{(0.8545 * \ln 31.2) + (-1.702)}$ x dilution factor = (3.445 ug/l x 14.8) = 50.9 ug/l

Lead Limits:
Lead is dependent on the hardness of the receiving water.
Acute Lead Limit = $e^{(1.273 * \ln 31.2) + (-1.46)}$ x dilution factor = (18.541 ug/l x 14.8) = 274 ug/l
Chronic Lead Limit = $e^{(1.273 * \ln 31.2) + (-4.705)}$ x dilution factor = (0.722 ug/l x 14.8) = 10.7 ug/l

Zinc Limits:
Zinc is dependent on the hardness of the receiving water.
Acute Zinc Limit = $e^{(0.8473 * \ln 31.2) + (0.884)}$ x dilution f. = (44.657 ug/l x 14.8) = 661 ug/l
Chronic Zinc Limit = $e^{(0.8473 * \ln 31.2) + (0.884)}$ x dilution f. = (44.657 ug/l x 14.8) = 661 ug/l

RESPONSE TO PUBLIC COMMENTS
Palmer Wastewater Treatment Plant Permit
National Pollutant Discharge Elimination System (NPDES), No. MA0101168

The U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) are issuing a final National Pollutant Discharge Elimination System (NPDES) permit for a POTW in Palmer, Massachusetts. The Final Permit authorizes the Town of Palmer to discharge wastewater to the Chicopee River and Ware River in accordance with the requirements of the Federal Clean Water Act (CWA), 33 U.S.C. §§1251 et. seq., and the Massachusetts Clean Waters Act, M.G.L. Ch. 21, § 26-53.

The Draft Permit public comment period began May 13, 2010, and ended on June 11, 2010. The following people submitted comments:

- Andrea F. Donlon, River Steward, Connecticut River Watershed Council, June 10, 2010 Letter
- Antonio J. daCruz, Project Manager, Tighe & Bond, June 11, 2010 Letter
- Paul E. Stacey, Director, Planning and Standards Division, Bureau of Water Protection and Land Reuse, Connecticut Department of Environmental Protection, June 3, 2010 Letter

The comment letters received by EPA are part of the administrative record. To obtain a copy of these comments and/or the Final Permit, please write or call Janet Deshais, EPA Region 1, Municipal Permits Branch (OEP06-1), 5 Post Office Square, Boston, MA 02109-3912; telephone: (617) 918-1667.

This document presents EPA's responses to public comments on the Draft Permit, in accordance with the provisions of 40 C.F.R. 124.17 and also describes changes made to the permit. The changes made to the permit are summarized below.

- Incorporated new sludge language in Part F for purposes of clarification. There is no substantive change in sludge requirements.
- Attachment D, Sludge Guidance, has been eliminated as part of the new sludge language.
- Incorporated new State Permit Conditions in Part K of the permit for purposes of clarification. There are no substantive changes in permit requirements.
- Requirement for NetDMR reporting has been included in Part J of the permit, and subsequent sections of the permit were renumbered. This change has been discussed with the permittee, who agreed to its inclusion in the final permit.
- The total nitrogen load for the Palmer Wastewater Treatment Plant has been changed from 541 pounds per day to 376 pounds per day to reflect the actual average total nitrogen load for 2004 – 2005 (see part I.B)
- The influent nitrogen sampling has been removed from the permit.
- Fecal bacteria testing will end on October 31, 2011, and E. coli testing will begin on April 1, 2012 (see footnote 6 on Page 5).
- A revised date of April 1, 2011 has been added to the permit for installing an alarm system for chlorination and dechlorination systems (see footnote 8 on page 5).
- The requirement to increase toxicity testing frequency to four times per year if an industrial user is added to the collection system has been removed from the permit (see footnote 13 on page 6).
- Ortho-phosphorus sampling start date has been changed to begin on July 1, 2011 (see footnote 15 on page 6).
- The phrase, "Until December 31, 2011," has been added to Part I.I.1 of the permit, establishing that date as the last day that Combined Sewer Overflow (CSO) discharges are authorized. See the Response to CRWC Comment #10 and Tighe & Bond Comment # 1 for the explanation of this change.

- The phrases "…be easily readable by the public from both the land and water" and "The permittee, to the extent feasible, shall place additional signs in languages other than English or add a universal wet weather sewage discharge symbol to existing signs based on a consideration of the primary language(s) of the residents and users of the water resources in the vicinity of the CSOs." Have been added to Part I.I.3.f. of the permit to clarify requirements regarding the CSO signs.
- All co-permittee requirements have been removed from the final permit. Please see the agencies' detailed explanation for this change at the end of this document.

Andrea F. Donlon, M.S., River Steward, Connecticut River Watershed Council (CRWC).

The Chicopee River is a major tributary to the Connecticut River, and the river segment that receives the treated effluent from this facility is listed as impaired due to pathogens. CRWC is particularly interested in improving water quality in the Connecticut River and its tributaries so that it can support existing primary and secondary contact uses, even during wet weather. We are glad that Palmer will be eliminating all of their CSOs by the end of 2011. Our comments are below.

Comment #1: Because the Fact Sheet did not provide information on the number of households or population size served by the facility, I obtained this information from the permit writer. For my own record, I am noting that the facility serves 7,985 in Palmer (80.6% of the total population served); 1,811 in Monson (18.3% of total population served); and 110 in Belchertown (1.11% of the total population served) for a total of 9,906 customers. In addition, Monson's flows contribute to the CSO 008 flow; and Belchertown's flows do not contribute any flows to any of the remaining CSOs.

Response: This information accurately represents the information given to the commenter by the permit writer.

Comment #2: It would be helpful if the Fact Sheet briefly summarized information submitted by permittees in infiltration and inflow (I/I) reports:

- what has been accomplished during the life of the existing permit, and
- what is on the horizon to tackle.

We note that with the facility treating about an average of 2.5 MGD, that amount calculates to a per capita water use of 252 gallons per day, if you leave out the industrial users. It appears that the facility may have an I/I issue because per capita water use (without lawn watering) is typically much less.

Response: When reviewing flow data for this facility it is important to remember that a portion of the collection system is served by combined sewers, which are designed to accept and convey storm water runoff to the wastewater. Comparisons of flow per capita between combined systems and separate systems are not especially useful.

As noted elsewhere in this response to comments, CSO are to be eliminated by the end of 2012 through separation of remaining combined sewers. At that time, the scope of necessary I/I work in the separate system will be clearer. We do note that the Town has already accomplished a significant amount of work within their separate sewer system. Specifically, in 2006 and 2007, the Town has cleaned and video taped in excess of 4500 linear feet of pipeline and replaced deficient pipe segments on Maple Street and Maple Terrace and eliminated cross connections. They have also flushed, rodded and video taped George, Buckland and Geraldine Streets in Depot

Village, and Pine Street in Bondsville. New pipelines have been installed in Barker Street. In 2008, the Town has replaced approximately 880 linear feet of sanitary sewer main which were in poor condition along Commercial, Main Pleasant, Elizabeth, School, and Vicardav in Thorndike Village, and along Fox Street in Depot Village. The Town has also investigated and identified residential and commercial buildings which have roof leaders and/or sumps connected to the sanitary sewer and implemented a program to disconnect such connections.

Comment #3: The permit limit for pH is 6.0 to 8.3 standard units. This limit is not consistent with Massachusetts Water Quality Standards, which is 6.5 to 8.3. A look at the effluent data in EPA's ECHO database indicates that the permit limit could be changed to 6.5 and it would not affect the permittee at all. CRWC therefore recommends the permit be changed to be consistent with MA WQS, especially because it appears that the requirement will not trigger the use of extra chemicals to achieve this limit.

Response: The current and draft permit limits of 6.0 to 8.3 for pH have been maintained in the final permit given the amount of dilution under low flow conditions, and given that the pH limits have been certified by the MassDEP and are protective for the receiving water.

Comment #4: CRWC supports the extension of the time period that the bacteria and chlorine limits are in place, from April 1 to October 31 rather than April 1 to October 15. Most Massachusetts permits in the Connecticut River watershed use the April 1 to October 31 time frame.

Response: The final permit maintains the time period of April 1 to October 31 for bacteria and chlorine limits.

Comment #5: Pages 7 and 8 of the Fact Sheet show the derivation of the new 7Q10 and the dilution factor for the Chicopee River at the site of the outfall pipe 027 (120.3 cfs and 14.8 cfs, respectively). The Fact Sheet explains that the derivation of the 7Q10 for the existing and earlier permits, 81.8 cubic feet per second (cfs), was not well documented. EPA has used a ratio method along with the 7Q10 for the nearest USGS gage on the Chicopee River at Indian Orchard to arrive at the new 7Q10.

- The Fact Sheet does not explain the period of record they used to obtain the 7Q10 at Indian Orchard.

- Flow data has been collected at the Indian Orchard station since 1928, but it would not be appropriate to use the entire period of record to arrive at the 7Q10 for this permit, since there have been significant diversions upstream since 1928 that affect the current 7Q10. The installation of Quabbin Reservoir and the Ware River diversion, in particular, had drastic effects on the average flow of the entire Chicopee River system. There have been others since then. The most appropriate period of record may possibly be something like 1967 to 2009.

- The new limits for total residual chlorine and copper may need to be revised. EPA should also re-visit dropping the aluminum limit if the dilution factor is modified back down to its earlier level.

Response: The flow period of record used to estimate the 7Q10 at the Chicopee River, Indian Orchard, MA USGS gage station was from 1928 - March of 2010 using the Streamstats program resulting in a 7Q10 flow of 128 cfs. The 7Q10 flow at this station for the time period that was suggested, from 1967 – 2010, resulted in a flow of 129 cfs. Since the difference between the two time periods is negligible, the entire period of record was used to determine the 7Q10 flow of the receiving water.

The drainage area at the WWTP that was used to determine the dilution for the current permit issued on September 29, 2000 appears to have been miscalculated. A similar dilution factor can be calculated using only the drainage area surrounding one river located above the WWTP. The dilution calculation that was used for the draft and final permit limits, however, correctly incorporated the drainage area of the two rivers located above the WWTP, and this may account for the discrepancy between the two dilution factors used for the current permit versus the reissued permit.

Comment #6: Though we question the new dilution factor in the comment above, if it holds, CRWC does not support doubling the discharge limitation for copper, from an average of 25 µg/L to 50.9 µg/L and a maximum of 32 µg/L to 69.1 µg/L. We understand that the limit is based on new 7Q10 information, but a concentration-based limit change may mean higher loadings of a metal that persists in the environment, and we think this is not best for ecological health. Because the facility has been meeting the existing, more stringent standard, we don't see why EPA can't keep that limit even if it is based on old and possibly erroneous flow information.

Response: Section 402(o) of the Clean Water Act generally provides that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. EPA has also promulgated anti-backsliding regulations that are found at 40 CFR § 122.44(l). For water quality–based limits, antibacksliding is satisfied if the relaxed limits achieve water quality standards, including antidegradation. Typically, where it is shown that less stringent limits will attain water quality standards, the Region will only relax the limits to values reflecting the demonstrated performance of the facility, if those values are more stringent than the new water quality-based limits, in order to satisfy antidegradation requirements. EPA reviewed the effluent data submitted by the facility for the period from January 2007 through July 2010 and noted that the reported values ranged from 10 ug/l to 56 ug/l In order to better characterize the variability of this data, EPA analyzed the data and calculated a monthly average discharge of 52.18 ug/l based on the 95th percentile and a daily maximum value of 71.09 ug/l based on the 99th percentile (see calculations in Attachment A). Since these values are greater than the calculated water quality-based limits (i.e., 50.9 ug/l average monthly, and 69.1 ug/l daily maximum), the water quality-based limits have been retained in the final permit.

Comment #7: The Fact Sheet at page 11 refers to an Exhibit A that includes nitrogen loading from 2004-2005 data. This Exhibit was not included in the Fact Sheet. Such an exhibit has been included in other permit Fact Sheets, which listed Palmer as having an average nitrogen load of 376 pounds per day using 2004-2005 DMR data. Now we see that this number is actually 541 pounds per day, a 44% increase above what had been estimated in the past. This increase calls into question the other numbers in the table and EPA's conclusion that a 25% reduction has already been met.

Response: The total nitrogen loading estimate in the permit has been changed from 541 pounds per day to 376 pounds per day. The higher value was based on a calculation performed by the permittee that was incorrect. It appears that the permittee double-counted the amount of ammonia-nitrogen in its calculation of total nitrogen. The value of 376 pounds per day included in Exhibit A of the fact sheet was correctly calculated, as are the values for the other facilities

Comment #8: The Fact Sheet at page 21 says, "… the draft permit includes the whole effluent acute toxicity (lethal concentration to 50% of the test organisms, or LC_{50}) limitation and a chronic toxicity (no observed effluent concentration, or C-NOEC) monitoring requirement." The table in part A.1.a of the draft permit, however, only lists an acute toxicity monitoring requirement. Given that the facility has a reasonable potential to cause or contribute to a violation of the calculated allowable chronic concentration value for copper (according to page 18 of the Fact Sheet), CRWC recommends that a chronic toxicity test be re-instated in the final permit.

Response: The Fact Sheet at page 21 incorrectly mentioned chronic toxicity testing. Chronic toxicity testing was not included in the draft permit. The draft permit proposed only acute toxicity testing for this facility, because the re-calculated dilution ratio corresponds to a low toxicity risk in the MassDEP Toxicity Policy. Therefore, the final permit has maintained the acute limitation and monitoring requirements that were proposed in the draft permit.

Comment #9: CRWC supports the addition of total phosphorus limit between May and October, and monthly testing of ortho-phosphorus between November and March.

Response: The final permit has maintained the draft permit total phosphorus limitations and monitoring requirements for May 1 through October 31. The final permit has also maintained the proposed ortho-phosphorus monitoring for November through March.

Comment #10: The Fact Sheet on page 3 says that, in accordance with an EPA Administrative Consent Order, the six remaining combined sewer overflows (CSOs) will be eliminated by the end of the year 2011. Section I.I.1 of the permit should therefore be modified to indicate that the permit will change after the CSOs are eliminated. Using the 2006 reissuance of the South Hadley NPDES permit as an example (Permit Connecticut River Watershed Council Page 3 No. MA0100455), the permit language in this section should be changed to read as follows: "Until December 31, 2011, during wet weather, the permittee is authorized to discharge storm water/wastewater from combined sewer outfalls listed in Attachment B of this permit, subject to the following effluent limitations."

Response: The language in Part I.I.1. has been changed to authorize the discharge from the six authorized CSOs until December 31, 2011. (See the response to Tighe & Bond Comment No.1 for further explanation of this compliance date).

Comment #11: Part I.I.1.c in the permit states that the CSO discharges "shall not cause or contribute to violations of Federal or State Water Quality Standards." The fact is that the CSOs are causing or contributing to violations of the State Water Quality standard for bacteria, the permittee is in violation of the current and draft permit.

Response: The commenter's observation is correct. Untreated discharges from CSOs violate water quality standards. These violations were the basis for EPA and MassDEP enforcement actions and the separation of the collection system will resolve those violations.

Comment #12: Part I.I.3.d must define "dry weather." See the 2009 Reissuance of the Springfield CSO NPDES permit (Permit No. MA0103331), section I.A.2.c for appropriate language to add.

Response: The draft permit included a dry weather definition under Part I.A.1.g., and this definition applies to all parts of this permit. Therefore, the final permit has not been changed with regard to this comment.

Comment #13: The second sentence of section I.I.3.f should be amended in keeping with all other recent CSO permits in the Connecticut River watershed (Holyoke, Montague, and Springfield), to say, "These signs shall be located at or near the combined sewer outfall structure and be easily readable by the public from both the land and the water."

Response: Part I.I.3.f. of the permit has been changed to include the following language: "These signs shall be located at or near the combined sewer outfall structure and be easily readable by the public from both the land and the water."

Comment #14: Section I.I.3.f should also be amended to say, "The permittee, to the extent feasible, shall place additional signs in languages other than English or add a universal wet weather sewage discharge symbol to existing signs based on a consideration of the primary language(s) of the residents and users of the water resources in the vicinity of the CSOs."

Response: Part I.3.f. of the final permit has been changed to include the following language: "The permittee, to the extent feasible, shall place additional signs in languages other than English or add a universal wet weather sewage discharge symbol to existing signs based on a consideration of the primary language(s) of the residents and users of the water resources in the vicinity of the CSOs."

Comment #15: As part of the public education minimum control, there should be additional requirements aside from signs, such as public notification in the form of press releases, website information, and notice to health agents. This requirement has become standard in most permits issued lately, and should not be omitted here, even if the CSOs will be eliminated in a year and a half.

Response: Given that the authorization to discharge from the six (6) remaining CSOs will end in the near future, EPA believes the public notification requirement under Part I.I.1.a.(8) of the permit will provide adequate protection in the meantime. Therefore, the final permit has remained unchanged with regard to this comment.

Antonio J. daCruz, Project Manager, Tighe & Bond

On behalf of the Town of Palmer, Tighe & Bond is submitting the following comments and suggested permit changes on the Draft Permit referenced above. Our comments are as follows:

Comment #1: Fact Sheet, Part II – We request that the date for elimination of the remaining six (6) CSOs be changed to December 15, 2012 in accordance with the November 25, 2008 letter from EPA granting a one-year extension to the EPA Administrative Consent Order.

Response: The commenter is correct that the compliance date for completing the CSO elimination project was extended by MassDEP on November 25, 2008 to December 15, 2012. The fact sheet incorrectly stated that the current CSO compliance schedule is in a federal court order. It is actually included in a MassDEP administrative consent order and the letter extending the

schedule was from MassDEP. A modified Fact Sheet is not developed as part of the final permit decision, but this comment and response serve to correct the permit administrative record.

However, EPA has recently received information from MassDEP that the Town has completed blocking CSO discharge pipes from all of the CSO regulators authorized by the permit, thereby eliminating those CSO discharges. The Town is to be congratulated for completing construction of its CSO abatement projects well in advance of the schedule established by the MassDEP compliance order.

Given this recent information, EPA considered eliminating the authorization to discharge from the six remaining CSOs in the final permit. However, in discussing this matter with MassDEP and the Town we understand that a short continuation of the authorization would be reasonable in order for the Town to ascertain that there are no conditions in the system (e.g. upstream overflows due to surcharging) that would necessitate re-opening of the blocked overflows. EPA has therefore allowed the authorization to discharge to continue until December 31, 2011. EPA believes that this will be sufficient time for the Town to ascertain whether the CSOs can remain blocked or will have to be re-opened on a temporary basis, and to complete any work necessary to allow the re-blocking of the overflows.

EPA would also like to clarify that the permit only authorizes the discharge of combined sewage from six overflows listed in permit Attachment B. Authorization to discharge combined sewage from any other outfall was not included in the draft permit and is not included in the final permit, nor is the discharge of anything but combined sewage authorized to be discharged through those outfalls (e.g. illicit connections to discharge pipes downstream of CSO regulators are not authorized by the permit).

Comment #2: Fact Sheet, Part II – We request that the number of industrial users be increased from 3 to 4. Polymer Injecting Molding has been issued an IPP permit, but has not yet begun operations. Additionally, another industrial user, Palmer Paving Corp, has contacted the Town with an imminent permit request. As such, we would request that the Fact Sheet and Permit reflect these additional users.

Additionally, as referenced in Part V, paragraph d. on page 21 of 28, and footnote 13, the Town requests that the requirement for toxicity testing frequency <u>not</u> increase to four times per year if a new significant industrial user is added to the system.

Response: A modified Fact Sheet is not developed as part of the final permit decision. However, the comments on the Fact Sheet are part of the permit administrative record.

The condition in footnote 13 of the permit that requires the permittee to increase the whole effluent toxicity (WET) testing frequency from twice per year to four times per year if a new significant industrial user (SIU) is added to the collection system has been removed from the permit. EPA believes that the pretreatment and categorical requirements that industrial wastewater must meet will be protective of water quality standards. Therefore, the final permit includes twice per year toxicity testing. However, if the toxicity testing results exceed the permit limit, this information would be cause for re-opening the permit and increasing the testing frequency. See 40 CFR 122.62(a)(2)

Comment #3: Fact Sheet, Part VII – Infiltration/Inflow (I/I) – Given that the Town of Palmer currently

has CSOs, developing and implementing an I/I program is limited. Therefore, we request that the paragraph reflect this condition.

Response: A modified Fact Sheet is not developed as part of the final permit decision. However, the comments on the Fact Sheet are part of the permit administrative record. The commenter is correct that the I/I requirements in Part I.E.3. of the permit only pertain to separate sewers. As reflected in other comments and responses (e.g. the response to Tighe & Bond Comment #1), it is clear that the Town has been eliminating combined sewers through separation projects, making a higher percentage of the system subject to the I/I requirements in Part E. EPA has not made any changes to the permit in response to this comment. EPA expects that the level of effort devoted to I/I reduction in the separate system will be adequate to ensure that I/I does not cause sanitary sewer overflows or effluent limit violations at the treatment plant.

Comment #4: Fact Sheet, Part XI – Combined Sewer Overflows (CSO) – The Town is currently under construction with the Phase 4 CSO Elimination Project which will eliminate the remaining six (6) CSOs and will be complete in accordance with its Administrative Consent Order (e.g. see comment #1 above). Part XI of the Fact Sheet should not apply after the Phase 4 CSO Elimination Project is completed.

Response: A modified Fact Sheet is not developed as part of the final permit decision. However, the comments on the Fact Sheet are part of the permit administrative record. As described in previous comments the authorization to discharge from CSOs ends on December 31, 2011 (see Part I.I.1 of the permit). The commenter is correct that the CSO conditions in the permit will be superfluous upon the complete elimination of CSO discharges. After December 31, 2011 (the date on which the CSO authorization ends) if all CSOs have been eliminated the permittee may request that the permit be modified to eliminate all CSO conditions in the permit. For CSO-related reports or other deliverables due after the date of the modification request, the permitte may submit a letter to EPA and MassDEP by the due date explaining that CSOs have been eliminated.

Comment #5: Fact Sheet, Part XII – Request that the last sentence of the third paragraph stating "However, the facility reports high flows during periods when there is no precipitation, indicating significant extraneous flows not attributable to storm water runoff" be removed. There are no such reports or information that would support this statement.

Response: A modified Fact Sheet is not developed as part of the final permit decision. However, the comments on the Fact Sheet are part of the permit administrative record.

The statement in the Fact Sheet was referring to past treatment plant flow data showing high flows to the treatment plant on days when there was no precipitation, and thus no runoff entering the combined portions of the collection system. The commenter is correct that the fact sheet did not include data to support this statement

In order to better respond to this comment, EPA reviewed daily operating logs for the months of May and August 2007. May is usually considered a wet weather month, due to high rainfall. Groundwater levels are usually also high during this month, due to rainfall and the melting of snow cover. August is usually a dry weather month, characterized by low rainfall and low groundwater tables.

First, EPA calculated a monthly average dry weather flow for August 2007 by eliminating flows for days having a total precipitation of 0.1 inches or **g**reater. The average flow for these days was

about 1.4 MGD. This flow approximates the average base sanitary flow for the facility, since the daily flows used to calculate this average do not include runoff and should also include minimal ground water infiltration. Next, EPA calculated the average dry weather flow for May 2007 using the same rules. The dry weather flow for this month was 3.2 MGD. Since the daily flows used to calculate both the dry weather average values in May and in August do not include runoff, and since the average base sanitary flow in May should be the same as in August, the difference between these two dry weather values (i.e., 3.2 MGD - 1.8MGD = 1.8MGD) represents extraneous, non- runoff flow. Therefore, the resulting 1.8 MGD value is about 55 percent of the dry day average flow in May 2007 (3.2 MGD), and this amount appears to be a sizeable percentage.

However, in doing this evaluation EPA also noted that the monthly average flows to the treatment plant have been trending downward. For example, the average dry weather flow in May 2009 is 1.75 MGD, a significantly lower value than for May 2007. Assuming the average base sanitary flow in 2009 is the same as calculated for August 2007 (1.4 MGD), the extraneous flow in May 2009 is 0.34 MGD (i.e., 1.75MGD - 1.4 MGD). Therefore, this extraneous flow value calculated is a much smaller amount than calculated for May 2007, and is only 20 percent of the May 2009 dry day average flow.

All of the data for the above calculations are shown on Attachment B. Although the calculations are relatively crude, they do seem to show that the Town has made significant progress in removing extraneous flows from its collection system over the past three years.

Comment #6: Permit, Part A Effluent Limitations and Monitoring Requirements – The requirements for total phosphorus and ortho-phosphorus will increase the Town's monitoring budget. The Town is requesting that this requirement be phased-in beginning next fiscal year, July 1, 2011 to allow for proper budgeting. Additionally, the Town is requesting that monitoring be conducted for phosphorus or ortho-phosphorus; not both. Given that ortho-phosphorus is not included in Attachment B, the Town is questioning the purpose of the additional monitoring.

Response: The monitoring schedule for total phosphorus in the draft permit is the same as in the 2000 permit, so will not cause any changes in the Town's monitoring budget. The monitoring for ortho-phosphorus was not included in the 2000 permit. The final permit requires that monitoring for ortho-phosphorus begin on November 1, 2011 to address the Town's budgeting concerns.

Comment #7: Permit, Part A Effluent Limitations and Monitoring Requirements – The additional Nitrogen monitoring requirements from once per month to once per week will result in a substantial increase in the Town's monitoring budget. The additional monitoring will increase by approximately $4,500 per year or a 10% increase. The Town is requesting that this requirement be phased-in beginning next fiscal year, July 1, 2011 to allow for budgeting.

Response: The final permit requires once per month Nitrogen sampling until July 1, 2011 in order to allow for proper budgeting. The Nitrogen sampling frequency will increase to once per week beginning the week of July 3, 2011.

Comment #8: Permit, Footnote #1 and #6 and Fact Sheet Part V, 3B4 – Request that E. coli testing be phased in. The Town has already purchased the material required to perform fecal testing for this year and does not have adequate budget remaining. We request that E. coli testing be phased-in beginning next fiscal year, July 1, 2011 to allow for budgeting.

Response: The permit has been changed to require that E. coli testing begin on April 1, 2012 to allow for proper budgeting. Fecal bacteria testing will continue until E. coli bacteria testing begins.

Comment #9: Permit, Footnote #7 – We request that the residual chlorine limits and monitoring requirements be changed for 2010. We request a period of April 1, 2010 to October 15, 2010 in order to facilitate the Town's conversion to a sodium hypochlorite system which has already been designed and approved by MassDEP. This change would only be applicable to the year 2010 to facilitate the conversion and start-up required to complete the sodium hypochlorite modifications.

Response: The final permit has not been changed in this regard, since the final permit will become effective after the end of the 2010 disinfection season.

Comment #10: Permit, Footnote #8 – Request that the date referenced in the first sentence be changed from April 1, 2010 to April 1, 2011.

Response: Part I.A.1.a.8. of the permit has been changed from "April 1, 2010" to "April 1, 2011" to reflect the time necessary to install an alarm system for chlorination and dechlorination systems for indicating system interruptions or malfunctions.

Comment #11: Permit, Footnote #9 – Request that the requirement to test the influent for nitrogen once per month be eliminated. Weekly effluent monitoring is already being implemented and the influent testing will only add additional cost and not provide any additional information.

Response: The influent nitrogen sampling has been removed from Part I.A.1.a.9. of the permit. EPA does not believe that influent sampling is necessary in order to ensure that the discharge of nitrogen does not increase above baseline. The weekly effluent sampling should adequately track nitrogen discharges.

Comment #12: Permit, Footnote #13 – We request that toxicity tests results be reported by the 30th day of the second month after the sample was taken in accordance with the current permit. Providing an additional 30 days would facilitate lab turnaround time required.

Response: The draft permit shortened the time allowed for submittal of WET tests to make the schedule the same as for other Massachusetts POTWS. The other facilities have met this schedule without difficulty. The permit has not been changed.

Comment #13: Permit, Figure 2 – We request that the figure be revised to eliminate the 'sewage grinder' from the process flow diagram.

Response: Figure 2 was attached to the Fact Sheet, rather than the Permit. A modified Fact Sheet is not developed as part of the final permit decision. This comment and response will serve to correct the permit administrative record.

Paul E. Stacey, Director, Planning and Standards Division, Bureau of Water Protection and Land Reuse, State of Connecticut, Department of Environmental Protection (CTDEP).

The CTDEP appreciates this opportunity to comment on the draft NPDES permit for the Town of Palmer, including the Wastewater Treatment Plant (WWTP) and six CSOs. The draft permit authorizes the Town to discharge to the Connecticut River via the Chicopee, Quaboag, and Ware Rivers located in Massachusetts. The Connecticut River subsequently drains to Long Island Sound (LIS). The CTDEP has an interest in discharges to waters that drain to Long Island Sound since hypoxic conditions, which occur annually in the summer, have been documented to result from excessive amounts of nitrogen. Discharges from wastewater treatment plants contribute to the nitrogen loading to LIS. In response to this occurrence, Connecticut and New York jointly developed a Total Maximum Daily Load (TMDL) for nitrogen which was approved by EPA in April, 2001. In addition to a number of nitrogen reduction efforts within Connecticut and New York, the TMDL specifies a 25% reduction in the estimated nitrogen load from states upstream of Connecticut (Massachusetts, Vermont, and New Hampshire).

Comment #1: The draft permit authorizes discharges from the Palmer WWTP and demonstrates initial efforts aimed at reducing the amount of nitrogen discharged to LIS from upstream states. It includes a Special Condition for the WWTP to maintain a nitrogen load of approximately 541 pounds per day based on a 2004 and 2005 annual average and requires the WWTP permittee to conduct an evaluation of optimization methods designed to maintain this nitrogen load. The draft permit also requires the permittee to submit an annual report that outlines nitrogen removal efficiencies, documents the annual nitrogen load discharged, and tracks trends in the nitrogen load. The CTDEP is pleased that such stipulations targeted at nitrogen loading have been proposed in the draft Palmer WWTP NPDES permit and hopes to see this Special Condition incorporated in the final version.

Response: The final permit maintains the condition for the WWTP to maintain a nitrogen load that is based on the 2004 and 2005 annual average nitrogen load. As discussed in the response to CRWA Comment # 7, the annual average nitrogen load has been changed from 541 pounds per day to 376 pounds per day because there was an error in the nitrogen load calculations. Also, the language in Part B has been slightly edited to make it clear that the existing annual average mass discharge load is a cap rather than a target.

Comment #2: Also noted in the draft WWTP permit is a requirement for monthly monitoring of nitrogen species based on a 24 hour composite sample. This type of data will serve to refine nitrogen loading estimates to LIS from upstream states and assist the Connecticut River Workgroup (EPA, NEIWPCC, CT, NY, MA, VT, NH) in determining supportable management actions. (Note: NEIWPCC is the New England Interstate Water Pollution Control Commission.) However, we also recommend concurrent sampling along the process or treatment chain, especially the influent. Those data will help determine treatment efficiency and, should nutrient removal be required at some time in the future for local or Long Island Sound management, they will be helpful in determining appropriate technologies and management options.

Response: The final permit does not require any additional monitoring of nitrogen. However, if more stringent nitrogen limits are required in the future, the need for additional monitoring of nitrogen will be also considered when the permit is modified or reissued. (See also: Agencies' response to Tighe & Bond Comment #11)

Comment #3: In addition to the discharge from the WWTP, the draft permit authorizes discharges from six CSOs. Based on language included on page 9 of the draft permit, it appears that the Town of Palmer has instituted a Long Term Control Plan for the CSOs. CTDEP is also pleased to see a

requirement for the operation and maintenance of the sewer system infastructure. We support the inclusion of this requirement in the final permit.

Response: The final permit has maintained the CSO and Operation and Maintenance requirements.

Additional clarification regarding the removal of the co-permittee requirements from the final permit.

After the close of the comment period on the draft permit, the Environmental Appeals Board issued a decision in *In re Upper Blackstone Water Pollution Abatement District*, NPDES Appeal Nos. 08-11, 08-12, 08-13, 08-14, 08-15, 08-16, 08-17, 08-18, 09-06 (EAB May 28, 2010), 14 E.A.D. In that decision, the Board remanded the co-permittee requirements of that permit to EPA for further articulation of the statutory, regulatory, and factual bases for expanding the scope of NPDES authority beyond the treatment plant owner and operator to separately owned and operated collection systems. EPA is currently developing an appropriate response to the questions posed by the Board on remand.

As explained in the Fact Sheet, the permit provisions applicable to the Palmer Wastewater Treatment Facility itself are necessary to address ongoing water quality problems in the Chicopee River system and are independent of the co-permittee provisions. Moreover, the prior permit expired over five years ago, and issuance of this final permit is overdue. In EPA's judgment, the need for expeditious implementation of the permit provisions applicable to the Palmer Wastewater Treatment Facility counsels against further delay in the issuance of the final permit. Consequently, EPA has elected to issue the final permit to the Town of Palmer as sole permittee, and to defer further action regarding specific co-permittee requirements applicable to the Towns of Monson and Belchertown while EPA conducts a legal, policy and factual assessment of the co-permittee issue. As was the case under both the prior and draft permit, the Town of Palmer remains responsible for preventing unauthorized discharges from its system, and must ensure that excess inflow and infiltration (regardless of origin) do not cause violations of effluent limitations or other permit requirements. (If the Town of Palmer finds it appropriate to request that Monson and/or Belchertown make certain improvements to their collection systems in order to facilitate Palmer's compliance with permit requirements, the Town may refer its concerns directly to those towns, pursuant to intermunicipal agreements or other means outside of the NPDES permit itself.)

For these reasons, the final permit does not include references to co-permittees in (i) the Title Page, (ii) paragraph I.B, (iii) paragraph I.C.3, or (iv) paragraph I.C.5. If EPA later determines that it is appropriate to include co-permittee requirements, EPA will take further action at that time according to the procedures of 40 CFR § 124.

Attachment A

Palmer Effluent Copper Analysis
no non-detects, >10 samples

Date	Cu (ug/L)	Yi lnCu (ug/L)	$(y_i - u_y)^2$	# samples per month
1/31/2007	27	3.2958	0.008389	1
2/28/2007	34	3.5264	0.019302	1
3/31/2007	35	3.5553	0.028196	1
4/30/2007	30	3.4012	0.00019	1
5/31/2007	31	3.4340	0.002168	1
6/30/2007	28	3.3322	0.00305	1
8/31/2007	20	2.9957	0.153427	1
9/30/2007	21	3.0445	0.117586	1
10/31/2007	17	2.8332	0.307156	1
11/30/2007	10	2.3026	1.176889	1
12/31/2007	32	3.4657	0.006132	1
1/31/2008	37	3.6109	0.049947	1
2/29/2008	25	3.2189	0.028411	1
3/31/2008	14	2.6391	0.560062	1
4/30/2008	19	2.9444	0.196241	1
5/31/2008	17	2.8332	0.307156	1
6/30/2008	20	2.9957	0.153427	1
7/31/2008	24	3.1781	0.043838	1
8/31/2008	21	3.0445	0.117586	1
9/30/2008	21	3.0445	0.117586	1
10/31/2008	20	2.9957	0.153427	1
11/30/2008	34	3.5264	0.019302	1
12/31/2008	36	3.5835	0.038451	1
1/31/2009	46	3.8286	0.194667	1
2/28/2009	48	3.8712	0.234034	1
3/31/2009	56	4.0254	0.406944	1
4/30/2009	45	3.8067	0.175756	1
5/31/2009	30	3.4012	0.00019	1
6/30/2009	35	3.5553	0.028196	1
7/31/2009	40	3.6889	0.090872	1
8/31/2009	29	3.3673	0.000405	1
9/30/2009	31	3.4340	0.002168	1
10/31/2009	27	3.2958	0.008389	1
11/30/2009	34	3.5264	0.019302	1
12/31/2009	30	3.4012	0.00019	1
1/31/2010	48	3.8712	0.234034	1
2/28/2010	45	3.8067	0.175756	1
3/31/2010	44	3.7842	0.157418	1
4/30/2010	35	3.5553	0.028196	1
5/31/2010	40	3.6889	0.090872	1
6/30/2010	52	3.9512	0.317886	1
7/31/2010	37	3.6109	0.049947	1

Daily Maximum Concentration - 99th percentile

u_y = Avg of Nat. Log of daily Discharge (lbs/day) =	3.38743
σ_y = Std Dev. of Nat Log of daily discharge =	0.37687
$\Sigma (y_i - u_y)^2$ =	5.82314
k = number of daily samples =	42
σ_y^2 = estimated variance = $(\Sigma[(y_i - u_y)^2]) / (k-1)$ =	0.14203

Daily Max Discharge Calculation

99th percentile daily max discharge = $\exp(u_y + 2.326*\sigma_y)$

Daily Max Discharge = 71.0952 ug/L

TSD-Table E-1, no ND, 99th percentile

Average Monthly Concentration - 95th percentile

Number of samples per month, n =	1
E(x) = Daily Avg = $\exp(u_y + 0.5\,\sigma_y^2)$ =	31.76751
V(x) = Daily Variance = $\exp(2u_y + \sigma_y^2) * [\exp(\sigma_y^2) - 1]$ =	154.00882
E(Xn) = E(x)	31.76751
V(Xn) = V(x)/n	154.0088221

Monthly Average Discharge Calculation

95th percentile monthly average discharge = E(Xn) + 1.645[V(Xn)]^(1/2)

Monthly Avg Discharge = 52.18 ug/L

TSD-Table E-3, 95th percentile

Attachment B

August-07	Rainfall (in)		Total Daily Flow (MGD)	Dry Day Flow (MGD)
1	0		1.4	1.4
2	0		1.2	1.4
3	0.02		1.2	
4	0		1.3	1.3
5	0		1.4	1.4
6	0.07		1.6	
7	0.37		1.7	
8	0		1.5	1.5
9	0.02		1.4	
10	0.3		1.5	
11	0		1.4	1.4
12	0.01		1.5	
13	0.39		1.7	
14	0		1.4	1.4
15	0		1.5	1.5
16	0		1.4	1.4
17	0.84		1.7	
18	0		1.3	1.3
19	0.07		1.4	
20	0		1.5	1.5
21	0		1.5	1.5
22	0		1.5	1.5
23	0		1.4	1.4
24	0		1.4	1.4
25	0		1.3	1.3
26	0		1.3	1.3
27	0		1.5	1.5
28	0		1.4	1.4
29	0		1.4	1.4
30	0		1.4	1.4
31	0		1.4	1.4
	Total	2.09	Average 1.44	1.41

May-07	Rainfall (in)		Total Daily Flow (MGD)	Dry Day Flow (MGD)
1	0.15		3.9	
2	0		3.7	3.7
3	0		3.4	3.4
4	0		3	3
5	0		3.4	3.4
6	0		3.5	3.5
7	0		3.4	3.4
8	0		3.3	3.3
9	0		3	3
10	0.12		2.9	
11	0.12		3.1	
12	0.02		3.3	
13	0		3.4	3.4
14	0		3.1	3.1
15	0.19		3.1	
16	1.9		5.4	
17	0.02		4	
18	0.35		3.7	
19	0.21		4	
20	0.16		4	
21	0		3.8	3.5
22	0		3.5	3.5
23	0		3.5	3.5
24	0		3.2	3.2
25	0		2.7	2.7
26	0		2.9	2.9
27	0		2.9	2.9
28	0		3.3	3.3
29	0		3	3
30	0		2.7	2.7
31	0.13		2.9	
	Total	3.37	Average 3.39	3.22

May-09	Rainfall (in)		Total Daily Flow (MGD)	Dry Day Flow (MGD)
1	0.13		1.7	
2	0		1.7	1.7
3	0.07		1.8	1.8
4	0.12		1.8	
5	0.5		2	
6	1.08		2.5	
7	0.68		2.7	
8	0.09		2.7	
9	0.47		2.3	
10	0		2.1	2.1
11	0		2	2
12	0		2	2
13	0		1.9	1.9
14	0.2		1.9	
15	0		1.7	1.7
16	0.76		2	
17	0.13		2.1	
18	0.01		1.9	1.9
19	0		1.8	1.8
20	0		1.8	1.8
21	0		1.7	1.7
22	0		1.5	1.5
23	0		1.5	1.5
24	0		1.5	1.5
25	0.01		1.6	1.6
26	0.24		1.7	
27	0.03		1.7	1.7
28	0.14		1.6	
29	0.23		1.7	
30	0		1.5	1.5
31	0.5		1.5	
	Total	5.39	Average 1.87	1.75