UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND
1 CONGRESS STREET
SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

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

NPDES NO: MA0103152

DATE OF PUBLIC NOTICE:

NAME AND ADDRESS OF APPLICANT:

Board of Sewer Commissioners
Town of Barre
441 Wheelright Road
Barre, MA 01005

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Barre Wastewater Treatment Plant
441 Wheelright Road
Barre, Massachusetts 01005

RECEIVING WATER: Ware River (Segment MA 36-04)
(Chicopee River Basin)

CLASSIFICATION: B (Warm Water Fishery - High Water Quality)

LATITUDE: 42°22' 35"N **LONGITUDE:** 72° 06' 52"W

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

The above named applicant has requested that the U.S. Environmental Protection Agency reissue its NPDES permit to discharge into the designated receiving waters, the Ware River.

The Barre Wastewater Treatment Plant treats primarily domestic wastewater and, on occasion, up to 24,000 gallons per day (GPD) of landfill leachate. The leachate is held in aerated lagoons at the landfill until it is discharged to the treatment plant. The facility also provides treatment to about 4,000 gallons of septage per month from within the Town. The wastewater is collected by a separate sanitary sewerage system which is subject to extraneous flows due mostly to sump

pump connections. In order to receive State certification, the current permit required the development and implementation of an Infiltration/Inflow (I/I) control plan. As a result, the Town is presently in the process of implementing a multi-year I/I control plan.

The Barre Wastewater Treatment Plant is a 0.3 million gallons per day (MGD) secondary treatment facility using the extended aeration process. The treatment plant consists of grit channels, bar racks, oxidation ditches, secondary clarifiers, and ultraviolet (UV) disinfection facilities. Solids are pumped to the aerated sludge holding tank and then to the belt filter press for dewatering. The sludge cake is transported off-site for disposal at a privately-owned landfill along with other municipal waste. The location of the facilities is shown in Figure 1.

Major planned modifications to the treatment plant include improvements to the headworks, flow equalization tanks, and piping improvements.

II. Description of Discharge

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

III. Permit Limitations and Conditions

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

IV. Permit Basis and Explanation of Effluent Limitation Derivation

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

Under Section 301(b)(1)(B) of the Clean Water Act (CWA), Publicly Owned Treatment Works (POTW's) had to achieve effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth in 40 CFR Part 133. The regulations describe the secondary treatment requirements for biochemical oxygen demand (BOD_5), Total Suspended Solids (TSS), and pH. The "Average Monthly" and "Average Weekly" BOD_5 and TSS limitations are based on the requirements of 40 CFR §133.102. Numerical limitations for pH and fecal coliform are based on state certification requirements under Section 401(a)(1) of the CWA as described in 40 CFR §124.53 and state water quality standards in 314 CMR 4.05 (b) 3 and 4, respectively.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on

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

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

Also note that according to EPA regulations 40 CFR § 122.44(l), when a permit is reissued, effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards or conditions in the previous permit, unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued. In addition, in accordance with regulations found at 40 CFR Section 131.12, MA DEP has developed and adopted a statewide antidegradation policy to maintain and protect existing in-stream water quality. The Massachusetts Antidegradation Provisions are found at Title 314 CMR 4.04. No lowering of water quality is allowed, except in accordance with the antidegradation provisions.

The limits in the draft permit are based upon information in the application, the existing permit, a site visit, discharge monitoring reports, and toxicity test results.

Waterbody Classification and Usage

The Ware River is classified as a Class B (Warm Water Fishery) waterbody. The Massachusetts Surface Water Quality Standards (314 CMR 4.05(3)(b)) state that Class B waters shall have the following designated uses:

> *"These waters are designated as habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value."*

The *Chicopee River Basin 1998 Water Quality Assessment Report* indicates that the river segment receiving the Barre Wastewater Treatment Plant's discharge is attaining its uses for aquatic life with other uses not assessed. This river segment does not appear on the *Massachusetts Year 2002 Integrated List of Waters* [Clean Water Act, Section '303(d) list'] as

requiring a TMDL.

The limits in the draft permit are based on information in the application, the existing permit, discharge monitoring reports, and a site visit.

Flow and Dilution Factor

The design flow of the facility is 0.3 MGD (0.46 cfs). In its permit application submittal letter dated January 19, 2005, the Town requested that the monthly average flow limit be increased to 0.38 mgd while it undertakes a six year infiltration/inflow control plan. However, 40 CFR §122.45(b) requires that, in the case of POTWs, permit effluent limitations, or prohibitions shall be calculated based on design flow. Therefore, the flow limit will remain at 0.3 mgd and the Town must address the I/I as necessary to maintain compliance with the limit.

The proportion of the 7Q10 Ware River flow at the outfall to the 7Q10 flow at gage station No. 01173500, Ware River at Gibbs Crossing, is in the same proportion as the respective drainage areas. An examination of the flow data indicates that the 7Q10 of 22.37 cfs at the gage station used in the previous Fact Sheet is still valid. The resulting 7Q10 flow and dilution factor calculations are below.

Drainage Area @ outfall: 115 square miles
Drainage Area @ Gage Station: 197 square miles
7Q10 @ Gage Station: 22.37 cubic feet /second (cfs)
7Q10 @ outfall: 115/197 x 22.37 cfs = 13.06 cfs

Dilution Factor = (River 7Q10 @ Discharge + Design Flow) ÷ Design Flow
Dilution Factor = (13.06 cfs + (0.46 cfs)) ÷ 0.46 cfs = 29

BOD and TSS

Under Section 301(b)(1)(B) of the Clean Water Act (CWA), Publicly Owned Treatment Works (POTW's) had to achieve effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements for biochemical oxygen demand (BOD_5) and total suspended solids (TSS) are set forth in 40 CFR Part 133. The 30-day average percent removal limit of at least 85% for BOD_5 and TSS is based on the requirements in 40 CFR §133.102.

The mass limits calculations for BOD_5 and TSS are below.

mass limits	Flow x Concentration x Conversion Factor = lbs/day
average monthly	0.3 mgd x 30 mg/l x 8.34(lb)(l)/(mg)(gal) = 75 lbs/day
average weekly	0.3 mgd x 45 mg/l x 8.34(lb)(l)/(mg)(gal) = 113 lbs/day

pH and Fecal Coliform

The limitations for pH and fecal coliform are based upon the Massachusetts state certification

requirements under Section (401) (a) (1) of the Clean Water Act, as defined in 40 CFR§124.53 and water quality standards

Nitrogen

The Long Island Sound Comprehensive Conservation and Management Plan (CCMP) identifies excessive discharges of nitrogen from sewage treatment plants as the primary cause of low dissolved oxygen levels in the Sound. This condition is the most serious water quality impairment in the Sound and reduces the viable habitat to support fish. The EPA is presently requiring total nitrogen monitoring for all facilities which ultimately discharge to Long Island Sound. The development of nitrogen loadings of all tributaries to the Sound will be part of the Agency's approach to establish a nitrogen control strategy. To this end, the permit requires quarterly, year-round reporting of total nitrogen as Kjeldahl nitrogen and nitrite and nitrate nitrogen.

Phosphorus

State water quality standards require any existing point source discharge containing nutrient in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients. Phosphorus interferes with water uses and reduces instream dissolved oxygen.

EPA has published national guidance documents which contain recommended total phosphorus criteria and other indicators of eutrophication. EPA's *Quality Criteria for Water 1986* (the Gold Book) recommends, in order to control eutrophication, that in-stream phosphorus concentrations should be less than 100 ug/l (0.100 mg/l) in streams or other flowing waters not discharging directly to lakes or impoundments. Using the dilution factor of 29 and the Gold Book criteria, the phosphorus limit would be:

$$29 * 100 \text{ ug/l} = 2900 \text{ ug/l} = 2.9 \text{ mg/l}$$

The data in Attachment 1 indicates that the facility's discharge has the potential to exceed the Gold Book water quality standard.

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

Using the ecoregion criteria, the phosphorus limit would be:

$$29 * 24 \text{ ug/l} = 696 \text{ ug/l} = 0.7 \text{ mg/l}$$

As discussed above, the *Chicopee River Basin 1998 Water Quality Assessment Report* did not assess this segment for most uses. Two downstream impoundments, Diamond International Impoundment on the Ware River and Red Bridge impoundment on the Chicopee River, are potentially affected by phosphorus loadings. In addition, the downstream Ware WWTP presently has a 1 mg/l phosphorus limit. Consequently, the draft permit includes a phosphorus limit of 1 mg/l. If additional data or the completion of a Total Maximum Daily Loading (TMDL) indicates the need for more stringent limits, EPA and DEP may exercise the reopener clause of Part II A. 4 of this permit and modify the phosphorus numerical limits.

Copper

EPA is required to limit any pollutant that may be discharged at a level that caused, or has the reasonable potential to cause, or contributes to an excursion above any water quality criterion. Copper may be toxic to aquatic life at low concentrations, so possible effluent limitations were compared to past monitoring data to determine if there is a reasonable potential to cause or contribute to a violation of water quality.

The *EPA Quality Criteria for Water, 1986* set forth the methodology for establishing water quality criteria for copper, a hardness dependent pollutant. In the *National Recommended Water Quality Criteria: 2002* EPA updated its national recommended water quality criteria for pollutants. 314 CMR 4.05(5)(e) Toxic Pollutants of the State water quality standards specifies *"The Department shall use the water quality criteria for the protection of aquatic life expressed in terms of the dissolved fraction of metals."* Using a lower hardness value of 20 mg/l for the Ware River based upon recent WET test data and a conversion factor (CF) to convert recoverable to dissolved copper, the chronic and acute criteria calculations for the State water quality standards are as follows.

Chronic instream criteria	$e^{((0.8545*\ln 20) + (-1.702))} * 0.96$ (CF) = 2.20 ug/l
Acute instream criteria	$e^{((0.9422*\ln 20) + (-1.700))} * 0.96$ (CF) = 2.95 ug/l

EPA regulation 40 CFR §122.45(c) *Metals* requires that all permit effluent limitations for a metal be expressed in terms of "total recoverable metal". Thus, the copper limits are derived by multiplying the criteria by the dilution factor and dividing by a conversion factor. The calculations are shown below.

Chronic copper limit	2.20 ug/l * 29 ÷ 0.96(CF) = 67 ug/l
Acute copper limit	2.95 ug/l * 29 ÷ 0.96(CF) = 89 ug/l

These limits are slightly more stringent than the existing permit limits due to the downward adjustment of the hardness of the Ware River.

The Town of Barre Water Department implemented a corrosion control plan in 2002. Because of that action, the Town in its letter dated January 19, 2005, requested a reduction in the monitoring frequency for copper from monthly to quarterly. The data in Attachment 1 indicates that the levels of copper in the discharge has consistently achieved the effluent limitations. Consequently, the copper monitoring requirements are reduced from monthly to quarterly.

Whole Effluent Toxicity

National studies conducted by the Environmental Protection Agency have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents and aromatic hydrocarbons among others. The Region's current policy is to include toxicity testing requirements in all municipal permits, while Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

Based on the potential for toxicity resulting from domestic and industrial contributions, and in accordance with EPA regulation and policy, the draft permit includes acute toxicity limitations and monitoring requirements. (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 50 Fed. Reg. 30,784 (July 24,1985); see also, EPA's Technical Support Document for Water Quality-Based Toxics Control). EPA Region I has developed a toxicity control policy which requires wastewater treatment facilities to perform toxicity bioassays on their effluents.

Pursuant to EPA Region 1 policy, and MADEP's Implementation Policy for the Control of Toxic Pollutants in Surface Waters, discharges having a dilution ratio between 20:1 and 100:1 require acute toxicity testing four times per year. The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing including any synergistic effects of pollutants; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in conjunction with pollutant specific control procedures to control the discharge of toxic pollutants.

Examination of the acute toxicity test results in Attachment 1 indicates that the Town did not meet the acute toxicity tests requirements for the first three consecutive quarters in 2004. Its letter dated January 19, 2005, attributed the test failures to the ongoing construction of improvements to the treatment facilities. In that letter, the town also requested the reduction of the toxicity testing from quarterly to twice per year based upon the results of the other tests. However, Footnote 8 of Part 1.A. 1.of the current permit states “After submitting one year and a minimum of four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements.” Since that criteria has not been met, quarterly WET tests will continue to be required in the draft permit.

If the toxicity test results achieve the criteria established in Footnote 7 of the draft permit (i.e. 4 consecutive tests and a minimum of 1 year), EPA will consider a reduction in the WET testing requirements.

V. Sludge

The draft permit prohibits sludge discharges. In addition, Section 405(d) of the CWA requires that sludge conditions be included in all POTW permits. Because the permittee contracts out its sludge disposal, the permittee is subject to 40 CFR Part 503, and must comply with its provisions.

VI. Essential Fish Habitat

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

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

VII. State Certification Requirements

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection (MA DEP) certifies that the effluent limitations included in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The MA DEP has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality and continue to meet the requirements of the antidegradation policy. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects the draft permit will be certified.

VIII. Comment Period and Procedures the Final Decision

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

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

IX. Contacts

Requests for additional information or questions concerning the draft permit may be addressed Monday through Friday, between the hours of 9:00 am and 5:00 pm, to:

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