

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPA NEW ENGLAND OFFICE
1 CONGRESS STREET, SUITE 1100 (CPE)
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

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

NPDES PERMIT NO.: MA0100765

NAME AND ADDRESS OF APPLICANT:

Robert Carey, Supervisor
Fairhaven Water Pollution Control Facility
Arsene Street
Fairhaven, MA 02719

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Fairhaven Water Pollution Control Facility
Arsene Street
Fairhaven, MA 02719

RECEIVING WATER: Acushnet River (New Bedford Inner Harbor), in the Buzzards Bay
Watershed.

CLASSIFICATION: SB

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

The above named applicant has requested that the U.S. Environmental Protection Agency (EPA) reissue its NPDES permit to discharge into the designated receiving water. The facility is engaged in collection and treatment of domestic wastewater. The discharge is from a secondary wastewater treatment facility.

The Town of Fairhaven has a 5 mgd (average) secondary (activated sludge) wastewater treatment facility. The liquid treatment consists of preliminary, primary and secondary processes. Final effluent is disinfected by chlorine and discharged to the Acushnet River. Sludge is disposed off-site to Woonsocket, RI.

II. Description of Discharge.

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

III. Limitations and Conditions.

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

IV. Permit Basis and Explanation of Effluent Limitation Derivation

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology based treatment requirements represent the minimum level of control that must be imposed under Section 402 and 301(b) of the Act. Section 301(b)(1)(B) requires that Publicly Owned Treatment Works achieve limits based on secondary treatment. Secondary treatment is defined at 40 CFR Section 133.102.

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

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site specific criteria is established.

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

A permit may not be renewed, reissued or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-back sliding requirements of the CWA.

EPA's anti-backsliding provisions found in Sections 402(o) and 303(d)(4) of the CWA and in 40 CFR 122.44(1) prohibit the relaxation of permit limits, standards and conditions. Therefore technology based effluent limits in a reissued permit must be at least as stringent as those of the previous permit. Effluent limits based on BPJ, water quality and state certification requirements

must also meet the anti-backsliding provisions found under Section 402(o) and 303(d)(4) of the CWA.

A. Conventional Pollutants

Under Section 301(b)(1)(B) 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 CFR Part 133. The regulations describe the secondary treatment requirements for biochemical oxygen demand (BOD), total suspended solids (TSS), and pH. The "Average Monthly" and "Average Weekly" BOD and TSS limitations are based on the requirements of 40 CFR 133.102. Numerical limitations for pH and fecal coliform requirements are based on **state certification requirements** under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53. The limits of settleable solids are also based on state certification requirement. The limits of maximum daily BOD and TSS have been removed from the draft permit. They are no longer required as a condition for state certification. However, maximum daily BOD and TSS should be reported.

B. 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.

C. Pretreatment Program

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

The permittee will perform an Industrial User Survey as stated in the draft permit.

D. Toxicity

The receiving water has been classified as a Class SB waterway by the state. The designated uses for a Class SB water are 1) the protection and propagation of fish, other aquatic life and wildlife and 2) for primary and secondary contact recreation.

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 the following narrative statements and also 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:

- Waters shall be free from pollutants in concentrations or combinations that
- (a) Exceed the recommended limits on the most sensitive receiving water use;

- (b) Injure, or toxic to, or produce adverse physiological or behavioral responses in humans or aquatic life; or
- (c) Exceed site-specific safe exposure levels determined by bioassay using sensitive species.

National studies conducted by the Environmental Protection Agency (EPA) have demonstrated that domestic sources contribute both metal and organic toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and other constituents.

EPA's Technical Support Document (TSD) for water quality-based toxic control provides guidance concerning the control of toxicity and generally provides for a tiered approach to toxicity control for moderate and high factors of dilution. However, at low levels of dilution and considering uncertainty factors of specie sensitivity and effluent variability, the TSD recommends direct application of definitive toxicity testing.

Therefore, based on the potential for toxicity from domestic contributions, the low level of dilution, water quality standards and in accordance with EPA regulation and policy, the draft permit includes acute and chronic effluent toxicity limitation 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 Toxic Control). 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; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed.

Based on regional EPA and state policy the number and type of toxicity tests depends on available dilution in the receiving water. The available dilution ratio in the Acushnet River is 7.2:1. When the dilution is less than 10:1, the number of tests performed is one per quarter for both acute and chronic toxicity with three species. The recent toxicity test results demonstrated that most of the toxicity tests are within the required limits. Accordingly, EPA has determined that the number of specie and frequency of testing will be reduced from three to two and one per quarter to one per six month respectively, as stated in the permit. Based on available dilution ratio of 7.2:1, the receiving water concentration (RWC) for C-NOEC = $1/\text{Dilution Factor} \times 100 = 1/8.2 \times 100 = 12.2\%$.

As a condition of this permit, the testing requirements may be reduced by a certified letter from the EPA. This permit provision anticipates that the permittee may wish to request a reduction in WET testing. After four consecutive WET tests, demonstrating compliance with the permit limits for whole effluent toxicity, the permittee may submit a written request to the EPA seeking a review of the toxicity test results. The EPA will review the test results and pertinent information to make a determination. The permittee is required to continue testing at the frequency and species specified in the permit until the permit is either formally modified or until the permittee receives a certified letter from the EPA indicating a change in the permit conditions.

Chlorine and chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. The receiving water may or may not provide sufficient dilution of these compounds discharged by the Water Pollution Control Plant to meet the EPA recommended instream criteria for acute and chronic toxicity levels specified in water quality criteria document. The December 10, 1998 EPA Criteria states that the average total residual chlorine (TRC) in the receiving water should not exceed 7.5 ug/l for chronic toxicity protection and the maximum TRC should not exceed 13 ug/l to protect aquatic life from acute toxicity.

Based on the above potential for toxicity the chlorine is limited to daily maximum 0.107 mg/l and monthly average 0.061 mg/l (See Attachment B).

A review of recent DMRs shows that the facility generally achieves its TRC maximum daily effluent limit of 0.29 mg/l. The draft permit contains a much more stringent limit for TRC based on a newer estimate of the available dilution. The permittee has acknowledged that it will not be able to achieve the limits in the draft permit with the existing disinfection system and has proposed to construct an ultraviolet ray (UV) disinfection system. The proposed construction schedule for the disinfection system is to begin construction by 10/15/03 and to complete construction by 4/1/04. The UV system will be constructed on the same site as the chlorination system, necessitating a shut-down of the chlorination system during the construction period. The draft permit contains a construction schedule for the UV disinfection system, and maintains the existing TRC maximum daily effluent limit of 0.29 mg/l during the interim period.

Metals :

Certain metals like copper, nickel, cadmium and zinc can be toxic to aquatic life. EPA has evaluated (see below) the reasonable potential of toxicity on the concentration of metals in the effluent. Based on this evaluation EPA has determined that there is no reasonable potential for adverse impact on the aquatic life and no need to monitor and limit these metals.

Calculation of reasonable potential for copper, lead, zinc and cadmium :

All effluent metals data are taken from the Toxicity Test Reports from the period June 1998 to April 2001.

Allowable Receiving Water Concentration, $C = \text{Criteria (Tot. Rec.)} \times \text{Dilution Factor}$

From Federal Register, December 10, 1998, National Recommended Water Quality Criteria is used for salt water with a dilution factor of 8.2.

Copper : Chronic $C = 3.1 \times 8.2 / 0.83 = 30.6 \text{ ug/l}$ which is greater than the monthly average effluent concentration range of 3 - 17 ug/l. So, reasonable potential does not exist.

	Acute	$C = 4.8 \times 8.2 / .83 = 47.4 \text{ ug/l}$ which is greater than the maximum effluent concentration of 17 ug/l. So, reasonable potential does not exist.
Lead :	Chronic	$C = 8.1 \times 8.2 / .951 = 69.8 \text{ ug/l}$ which is greater than the monthly average effluent concentration range of 3 - 5 ug/l. So, reasonable potential does not exist.
	Acute	$C = 210 \times 8.2 / .951 = 1811 \text{ ug/l}$ which is greater than the maximum effluent concentration of 5 ug/l. So, reasonable potential does not exist.
Zinc :	Chronic	$C = 81 \times 8.2 / .946 = 702 \text{ ug/l}$ which is far greater than the monthly average effluent concentration range of 26 - 49 ug/l. So, reasonable potential does not exist.
	Acute	$C = 90 \times 8.2 / .946 = 780 \text{ ug/l}$ which is far greater than the maximum effluent concentration of 49 ug/l. So, reasonable potential does not exist.
Cadmium :	Chronic	$C = 9.3 \times 8.2 / .994 = 76.7 \text{ ug/l}$ which is greater than the monthly average effluent concentration of 1 ug/l. So, reasonable potential does not exist.
	Acute	$C = 42 \times 8.2 / .994 = 346 \text{ ug/l}$ which is far greater than the maximum effluent concentration of 1 ug/l. So, reasonable potential does not exist.

Nitrogen :

According to the final Buzzards Bay Comprehensive Conservation and Management Plan dated 8/91, nitrogen loading is one of the most serious problems threatening many embayments around Buzzards Bay. In 1994, the Buzzards Bay Project published the draft report named "A Buzzards Bay Embayment Sub-watershed Evaluation : Establishing Priorities for Nitrogen Management Action". This report highlighted the major sources of nitrogen to New Bedford Inner Harbor and all other Buzzards Bay embayments. It focused on the Fairhaven wastewater treatment plant as the major source to the Inner Harbor. On March 6, 1998 a refined evaluation of nitrogen loading and water quality of New Bedford Inner Harbor (Acushnet River) as it relates to the Fairhaven wastewater treatment facility was conducted by the Buzzards Bay Project. The report concluded that the Fairhaven wastewater plant is the single largest source of nitrogen to the estuary. On July 28, 2000, another report named 'A Preliminary Evaluation of Nitrogen Loading and Water Quality of New Bedford Inner Harbor (Acushnet River) as it Relates to the Fairhaven Wastewater Treatment Facility', further refined the nitrogen loadings and again concluded that the Fairhaven wastewater plant is the single largest source of nitrogen.

In March, 2002, Applied Science Associates, Inc. completed a draft report, "Flushing Analysis in the Acushnet River Estuary" that suggested that the residence time of the Fairhaven discharge in the estuary was approximately one day. This estimate of residence time is significantly less than the previous estimates. Understanding the residence time associated with nitrogen sources is one important component of determining required control levels.

A comprehensive Total Maximum Daily Load (TMDL) for the Acushnet River Estuary is currently under development. The TMDL will refine the residence time and determine what level of nitrogen control will be required for the Fairhaven Wastewater Treatment Plant in order to meet water quality standards. The TMDL will be completed within three years and will also determine acceptable nitrogen loads for all other sources of nitrogen to the estuary. During the next 12 months, the draft permit requires Fairhaven to complete a Nitrogen Removal Optimization Study which evaluates influent nitrogen loadings and control options, and evaluates the practicable extent to which nitrogen removal at the existing treatment facility can be further optimized. The draft permit further requires that upon EPA and MADEP approval, the recommendations of the study shall be implemented, and the WWTP operated to optimize the removal of nitrogen, consistent with the recommendations of the study.

Following completion of the TMDL, EPA will either modify or reissue the permit to incorporate any more stringent limits nitrogen limits mandated by the TMDL. If completion of the TMDL is delayed beyond the expected schedule, EPA will use available information to determine an appropriate nitrogen limit when the permit is reissued.

E. Sludge

In February 1993, the Environmental Protection Agency (EPA) promulgated standards for the use and disposal of sewage sludge. The regulations were promulgated under the authority of section 405(d) of the Clean Water Act (CWA). Section 405(d) of the CWA requires that sludge conditions be included in all municipal permits. The sludge conditions in the draft permit satisfy this requirement.

F. Essential Fish Habitat Determination (EFH)

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. ' 1801 et seq.(1998)), EPA is required to consult with NMFS if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish habitat. 16 U.S.C. ' 1855(b). The Amendments broadly define essential fish habitat as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. ' 1802(10). 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 fish 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.

Enclosed (see Attachment C) is the list of 16 managed species that are believed to be present during one or more lifestage within EFH Area, which encompasses the existing discharge site. No “habitat areas of particular concern”, as defined under §600.815(a)(9) of the Magnuson-Stevens Act, have been designated for this site. Although EFH has been designated for this general location, EPA has concluded that this activity is not likely to adversely affect EFH or its associated species for the following reasons:

- This is a reissuance of an existing permit, but with stricter effluent limits; new nitrogen limits are imposed;
- The quantity of discharge from the WWTF is 5.0 mgd monthly average; Effluent receives as a minimum secondary treatment using activated sludge processes;
- Effluent is discharged into the Acushnet River (New Bedford Inner Harbor) with an estimated dilution ratio of 7.2:1
- Limits specifically protective of aquatic organisms are established for chlorine, based on EPA water quality criteria;
- Acute and chronic toxicity tests will be conducted on Inland Silverside and Mysid Shrimp two times per year;
- The permit will prohibit any violation of state water quality standards.

Accordingly, EPA has determined that a formal EFH consultation with NMFS is not required. If adverse impacts to EFH are detected as a result of this permit action, NMFS will be notified and an EFH consultation will be promptly initiated.

G. Anti-degradation

This draft permit is being reissued with an allowable wasteload identical to the current permit with the same parameter coverage and no change in outfall location. New nitrogen and copper limits are imposed. The State of Massachusetts has indicated that there will be no lowering of water quality and no loss of existing water uses and that no additional anti-degradation review is warranted.

V. 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 40 CFR 124.53 and expects that the draft permit will be certified.

VI. Public Comment Period, and Procedures for Final Decision

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for the

arguments in full by the close of the public comment period, to the U.S. EPA, MA NPDES Permit Program 1, Congress Street, Suite 1100, (CPE), Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

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

VII. EPA Contact

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:

Suproakash Sarker, P.E.
MA NPDES Program Unit
Environmental Protection Agency
1 Congress Street, Suite 1100 (CPE)
Boston, MA 02114-2023
Telephone: (617) 918-1693

Date

Linda M. Murphy, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

Attachments: A- DMR data Summary
B - Sample Calculations

Attachment A

Fairhaven Water Pollution Control Facility
 Discharge Monitoring Data Summary
 NPDES Permit No. MA0100765, Fairhaven, MA

Effluent data from DMR for the dates 1/99 to 7/01

Parameter	Average of Monthly Average	Average of Maximum Daily
BOD - Permit Limits Monthly Ave. = 30 mg/l Max. Daily = 50 mg/l	11.3 mg/l	20.4 mg/l
TSS - Permit Limits Monthly Ave = 30 mg/l Max. Daily = 50 mg/l	9.7 mg/l	19.8 mg/l
Flow - Permit limit - 5.0 mgd (Monthly. Ave.)	2.83 mgd	---
Total Residual Chlorine Permit limit - 290 ug/l Max. day	-----	285 ug/l
Fecal Coliform - Permit limits Monthly Ave = 200 cfu/100ml Maximum Daily = 400 cfu/100ml	43 cfu/100ml	130 cfu/100ml
pH Permit limit 6.5 - 8.5 s.u.	6.57 s.u. Low = 6.1 s.u.	6.94 s.u. High = 7.1 s.u.
WET Test : LC-50 - Permit limits Maximum Daily = 100%	-----	Mysid = 100% Menidia = 100%

Attachment B

Treatment Plant Design Flow = 5.0 mgd

Receiving Stream - Acushnet River (New Bedford Inner Harbor)

Calculated Dilution Ratio = 7.2 : 1¹; Dilution Factor = (7.2 + 1)/1 = 8.2

Chlorine Residual:

EPA Suggested In-stream Criteria: Chronic: 7.5 ug/l
(From December 10, 1998 WQC) Acute: 13.0 ugl

Maximum Daily Value = 13 x 8.2 ug/l
= 107 ug/l

Average Monthly Value = 7.5 x 8.2 ug/l
= 61.5 ug/l

C-Noec: RWC = Receiving Water Concentration
= $\frac{1}{8.2} = 12.2$

or 12.2%

Footnote:

1. EPA approved UM Model is used to estimate the initial dilution based on a discharge from a single 36" dia. port oriented at 90 degrees.