UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
1 CONGRESS STREET, SUITE 1100 (CMP)
BOSTON, MASSACHUSETTS 02114-2023

# FACT SHEET

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

NPDES PERMIT NO.: **MA0025763**

NAME AND ADDRESS OF APPLICANT:

**River Terrace Healthcare**
**1675 Main Street**
**Lancaster, MA 01523**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**River Terrace Healthcare**
**1675 Main Street**
**Lancaster, MA 01523**

RECEIVING WATER: **North Nashua River (**MA81-04)

CLASSIFICATION: **B** (Warm water fishery)

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

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection [MassDEP] to reissue its NPDES permit to discharge into the designated receiving waters. The applicant operates a private nursing home with an onsite wastewater treatment facility that discharges to the North Nashua River [see Figure 1 for facility location]. This permit will expire five years from the effective date of the reissued permit.

## II. Description of Discharge

The current discharge from the wastewater treatment facility consists of treated domestic wastewater.

## III. Limitations and Conditions

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

## IV. Permit Basis and Explanation of Effluent Limitation Derivation

### General Requirements

The Clean Water Act (CWA) prohibits the discharge of pollutants to waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit unless such a discharge is otherwise authorized by the CWA. The NPDES permit is the mechanism used to

implement technology and water quality based effluent limitations and other requirements, including monitoring and reporting. This draft NPDES permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and any Massachusetts statutes and regulations. The regulations governing the EPA NPDES permit program are generally found at 40 CFR Parts 122, 124, 125 and 136.

EPA is required to consider technology and water quality based requirements when developing permit limits. The criteria and standards that EPA must use to determine technology-based requirements are in 40 CFR Part 125, Subpart A. Requirements under Section 301(b) of the CWA and/or requirements established on a case-by-case basis under Section 402(a)(1) should be included in the permit.

The CWA requires that dischargers satisfy both minimum technology and water quality requirements. Technology-based requirements are found in Section 301(b) of the CWA. Section 301(b)(1)(A) of the CWA requires the application of Best Practicable Control Technology Currently Available (BPT) with the statutory deadline for compliance having been July 1, 1977, unless otherwise authorized by the CWA. Section (301)(b)(2) of the CWA requires the application of Best Conventional Control Technology (BCT) for conventional pollutants, and Best Available Technology Economically Achievable (BAT) for non-conventional and toxic pollutants. The compliance deadline for BCT and BAT was as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated and no later than March 31, 1989.

EPA has not promulgated effluent guidelines for privately owned treatment plants treating domestic wastewater. Using Best Professional Judgment (BPJ) as described at Section 401(a)(1) of the Clean Water Act, EPA has used the secondary treatment requirements found at 40 CFR Part 133 for Publicly Owned Treatment Works (POTWs) as the basis for establishing technology-based effluent limits for this permit. The treatment technologies applied to this wastewater are the same as those used at POTWs and the wastewater characteristics are also very similar.

Under 301(b)(1)(c) of the CWA, discharges are subject to effluent limitations based on water quality standards and to the conditions of state certification under Section 401 of the CWA. Receiving stream requirements are established according to numerical and narrative standards adopted under State and/or Federal law for each stream use classification. Furthermore, the permit must conform to the conditions established pursuant to a State certification under Section 401of the CWA that meet the requirements of 40 CFR 124.53 and 124.55. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 CFR 122.44 (d). For purposes of applying EPA and MassDEP policies regarding procedures for establishing water quality-based limits and conditions, the discharge has been considered a POTW, given the similarities between the treatment technologies and the wastewater being treated.

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts. The Commonwealth of Massachusetts has a similar narrative criteria in its water quality regulations that prohibits such discharges (see Massachusetts 314 CMR 4.05(e)). The draft permit does not allow for the addition of chemicals in amounts, which would produce a toxic effect to aquatic life.

The general conditions of the permit are based on 40 CFR 122.41 and consist primarily of management requirements common to all permits. The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308(a) of

the CWA in accordance with 40 CFR 122.41(j), 122.44(i), and 122.48.

**Additional Requirements**
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 CFR § 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.

**Facility Description and Discharges**
The River Terrace Healthcare is a nursing home with a capacity of 82 beds. The facility discharges sanitary wastewater to the North Nashua River via a storm drain. The wastewater treatment system has recently been upgraded. Upgrades to the facility include installation of a BioClere two-stage biological treatment system (Model 30/24), one 4,000 gallon flow equalization tank, one Wallax (Model W-30 or equal) phosphorus precipitation system, and one UV disinfection unit (Model Tipton WW-UV-1M2 or equal). A UV unit replaced a chlorine disinfection system.

Kitchen flows are pretreated via the grease trap before entering a septic tank, where it is mixed with other sanitary wastewater from the healthcare facility, as well as sludge and recycled process wastewater from the BioClere and Wallax units. The discharge from the septic tank is then conveyed to the Bioclere units for biological treatment. The facility design allows for the retrofit of an additional BioClere two-stage system should it become necessary. Piping changes provide greater flexibility to operate the BioClere units in either series or parallel mode.

The treatment facility is designed to treat a maximum daily wastewater flow of 11,000 gallons per day (gpd), and an average daily flow of 7,500 gpd. See Figure 2 for the flow diagram of the facility.

**North Nashua River Water Quality**
The North Nashua River has been classified as Class B in the Massachusetts Surface Water Quality Standards, 314 Code of Massachusetts Regulations ("CMR") 4.05(3)(b). The Massachusetts Surface Water Quality Standards describe Class B waters as having the following uses: *as a 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.*

Section 303(d) of the Federal Clean Water Act (CWA) requires states to identify those water bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such require the development of a total maximum daily load (TMDL) for each pollutant causing non-attainment. The report *Massachusetts Year 2006 Integrated List of Waters* lists the North Nashua River segment (MA81) as being in non-attainment and lists the pollutants needing a TMDL as cause unknown; pathogens, taste, odor and color, turbidity and nutrients. Data from the *Nashua River Basin 1998 Water Quality Assessment Report* prepared by MADEP was used to provide the basis for the 303(d) listing indicated a partial support for: 1.) aquatic life [cause-nutrients suspected]; 2.) secondary contact [odor and turbidity]; 3.) aesthetics [odor and turbidity]. The report indicated a non-support for primary recreation [pathogens, odor and turbidity].

Available Dilution

The determination of effluent limits for the permit are based, in part, on the available dilution in the receiving water. Title Massachusetts 314 CMR 4.03(3)(a) requires that effluent dilution and subsequent effluent limitations be calculated based on the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, recorded over a 10 year recurrence interval. The 7Q10 and plant design flow are used to calculate available effluent dilution.

The U.S. Geological Survey maintains a river flow gage [station # 01094500] approximately three miles upstream from the point of discharge from the facility's WWTP. The 7Q10 flow at the gage provides a good estimation of the 7Q10 flow at the discharge point. The 7Q10 flow for the period of record from 1935-1996 is 32.8 cubic feet per second (cfs).

The dilution is calculated as follows:

$$\frac{\text{Plant flow + 7Q10 flow}}{\text{Plant flow}} = \text{Dilution Factor}$$

Plant flow = 0.0075 million gallons per day (MGD)
7Q10 flow = 32.8 cfs = 50.5 MGD

$$\frac{0.0075 \text{ MGD} + 50.5 \text{ MGD}}{0.0075 \text{ MGD}} = 6734$$

**Proposed Permit Effluent Limitations and Conditions**

Flow

The flow limitations are based upon the design flow of the upgraded system, which is 7,500 gallons per day. The existing permit has an average monthly flow limit of 6,000 gpd. The draft permit requires continuous monitoring of flow and requires the permittee to report the daily maximum flow each month.

$BOD_5$ and Total Suspended Solids (TSS)

The effluent limitations for $BOD_5$ and TSS concentration are the same as those limits found in the existing permit with exception of maximum daily $BOD_5$ and TSS which have been removed from the draft permit as they are no longer required as a condition for state certification. Maximum daily $BOD_5$ and TSS shall be monitored and reported as stated in the draft permit. The average monthly mass loading limits [see calculations below] have increased by 0.4 lbs/day and the average weekly mass loading limits have increased by 0.5 lbs/day. These increases are acceptable within the antidegradation provisions of the Massachusetts Surface Water Quality Standards [see 314 CMR 4.04]. See Table 1 for $BOD_5$ and TSS data reported by the permittee on their monthly discharge monitoring report.

The eighty-five percent (85%) $BOD_5$ and TSS removal requirement is new in this draft permit reissuance based on BPJ. This is consistent with conditions imposed on similar privately owned treatment works and EPA's definition of secondary treatment [see 40 CFR 133].

$BOD_5$ and TSS Mass Loading Calculations:

Calculations of maximum allowable loads for average monthly and average weekly $BOD_5$ and TSS are based on the following equation:

L: C x DF x 8.34 where:
L: Maximum allowable load in lbs/day
C: Maximum allowable effluent concentration for reporting period in mg/l.
DF: Design flow of 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.

At design plant flow capacity of 7,500 GPD:
(Concentration limit) [30] X 8.34 (Constant) X 0.0075 (design flow) = 1.9 lb/day
(Concentration limit) [45] X 8.34 (Constant) X 0.0075 (design flow) = 2.8 lb/day

Bacteria and pH
Bacteria and pH are based on state certification requirements for this facility under Section 401(d) of the CWA, 40 CFR 124.53 and 124.55, and water quality considerations. It should be noted that E.coli is the new bacteria criteria for fresh water systems (not associated with beach areas) which were adopted by MassDEP in the recently promulgated Surface Water Quality Standards, 314 CMR 4.00, on December 29, 2006 and approved by EPA on September 19, 2007.
See Table 1 for bacteria and pH data reported by the permittee on their monthly discharge monitoring report. See footnote 5 and Part D. Compliance Schedule of the draft permit, for details on the fecal coliform and E.coli requirements.

The limits are 126 cfu/100 geometric monthly mean and 409 cfu/100 maximum daily (this is the 90% distribution of the geometric mean of 126 cfu/100 ml). The frequency of monitoring is once per week.

Settleable Solids
Settleable solids monitoring requirements have been removed from the draft permit, as these are no longer a state certification requirement.

Total Phosphorus
As previously described, the segment of the North Nashua River receiving this discharge is listed on the Massachusetts Year 2006 Integrated List of Waters for nutrients. Major discharges to this segment have received total phosphorus limits of 0.2 mg/l, consistent with the draft Total Maximum Daily Load (TMDL) prepared by MassDEP. The discharge from River Terrace Healthcare was not included in the TMDL, but MassDEP and EPA believe it is appropriate to include a monthly average limit of 1 mg/l in the draft permit. This will ensure the discharge does not cause or contribute to water quality standards in the receiving water.

A total phosphorus limit of 1.0 mg/l for the period of May 1 through October 31 has therefore, been added to the draft permit. The upgraded treatment system was designed with a phosphorus removal system and it is expected the limit will easily be met.

Whole Effluent Toxicity (WET):
Based on the potential for toxicity resulting from this discharge, and in accordance with EPA regulation and policy, the draft permit includes acute toxicity limitations and monitoring requirements. (see *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 that requires wastewater treatment facilities to perform toxicity testing for state certification. The frequency and the type of WET test depend on the dilution ratio and risk factor.

Pursuant to EPA Region I policy, discharges having a dilution ratio of greater than 100:1, as is the case with River Terrace Healthcare, require acute toxicity testing once per year with the $LC_{50}$ at 50%. The $LC_{50}$ is the concentration of the effluent that causes mortality to 50% of the test organisms. 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.

The draft permit requires that the permittee conduct an acute WET testing on Outfall 001 effluent once per year, as in the current permit. Each test must be conducted using the test specie *Ceriodaphnia dubia* in accordance with EPA Region I protocol to be found in permit Attachment A, Freshwater Acute Toxicity Test Procedures and Protocol. The protocol also specifies a $LC_{50}$ limit of 50% for a facility with a dilution factor greater than 100.

**Antidegradation**

This draft permit is being reissued with an allowable wasteload identical or more stringent than the current permit and no change in outfall location. 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 antidegradation review is warranted.

## V. Essential Fish Habitat

Under the 1996 Amendments to the Magnuson-Stevens Fishery Conservation and Management Act, EPA is required to consult with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) if EPA's actions or proposed actions that permits may adversely impact any essential fish habitat (EFH). The Amendments broadly define EFH as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Adversely impact means any impact which reduces the quality and/or quantity of EFH."

EFH is only designated for species for which federal Fisheries Management Plans exist. A NOAA Fisheries website (See http://www.nero.noaa.gov/hcd/webintro.html) contains maps of designated EFH. In some cases, a narrative identifies rivers and other waterways that should be considered EFH due to present or historic use by federally managed species such as Atlantic salmon.

EPA's review of available EFH information indicates that North Nashua River is not designated EFH for any federally managed species. As such, EFH consultation with NOAA Fisheries is not required.

## VI. Endangered Species

As the federal agency charged with authorizing the discharge from this facility, EPA is in communication with NOAA Fisheries and the United States Fish and Wildlife Service (USFWS) as part of EPA's consultation responsibilities under section 7(a)(2) of the Endangered Species Act

(ESA) for potential impacts to federally listed species.

EPA has structured the proposed limits to be sufficiently stringent to assure that Water Quality Standards. The effluent limits established in this permit ensure the protection of aquatic life and maintenance of the receiving water as an aquatic habitat. EPA finds that adoption of the proposed permit is not likely to adversely affect any threatened or endangered species or its critical habitat. EPA is in communication with NMFS and USFWS

The Department of Interior has listed the Shortnosed Sturgeon (Acipenser brevirostrum) as endangered for portions of the greater Merrimack River watershed including the North Nashua River. The shortnose sturgeon was placed on the original endangered species list in 1967 [32 Fed. Reg. 4001 (1967)] by the USFWS. Currently, NOAA Fisheries has authority over this species under Section 4(a) (2) of the ESA, 16 U.S.C. Section 1533 (a) (2). At present, there are 20 recognized distinct population segments [63 Fed. Reg. No. 242, pp. 69613-69615, December 17, 1998], which all remain listed as endangered.

## VII. State Certification Requirements

EPA may not issue a permit unless the MassDEP with jurisdiction over the receiving waters certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The staff of the MassDEP has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the Commonwealth and expects the draft permit to be certified.

## VIII. Comment Period and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, Betsy Davis, U.S. EPA, Office of Ecosystem Protection, Municipal Permits Branch (CMP), 1 Congress Street, Suite 1100, Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the Draft Permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public meeting may be held if the criteria stated in 40 C.F.R. § 124.12 are satisfied. In reaching a final decision on the Draft Permit, the EPA 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 any public hearings, if such hearings are held, the EPA 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. Within 30 days following the notice of the Final Permit decision, any interested person may submit a petition for review of the permit to EPA’s Environmental Appeals Board consistent with 40 C.F.R. § 124.19.

## IX. EPA and MassDEP Contacts

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


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