

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

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

NPDES PERMIT NO.: **MA0031658**

DATE OF PUBLIC NOTICE: 5/2/03

NAME AND ADDRESS OF APPLICANT:

**Battle Road Farm Condominium Trust
c/o First Realty Management
151 Tremont Street
Boston, MA 02111**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Battle Road Farm Wastewater Treatment Facility
39 Indian Camp Lane
Lincoln, Massachusetts 01773**

RECEIVING WATER: **Wetland : MA 83-08**

CLASSIFICATION: **Class 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") for the reissuance of its NPDES permit to discharge treated sanitary wastewater into the above referenced channelized wetland. This multiple unit residential development/condominiums, owned by Lincoln House Associates Limited Partnership, includes a sewer system and treatment facilities for the collection and treatment of domestic wastewater. The discharge from this advanced wastewater treatment facility (the 'facility'), operational since 1989, is via Outfall 001 to a wetland within the Shawsheen River watershed. See **Figure 1** for the facility and discharge location. The existing permit expired on May 22, 2002 and was administratively continued. This permit, after it becomes effective, will expire in 2007, consistent with the Massachusetts Watershed Initiative basin cycle for the Shawsheen watershed.

The Battle Road Farm facility is an advanced wastewater treatment facility located in Lincoln, Massachusetts and is designed to treat up to 33,000 gallons per day of sanitary wastewater. The facility serves approximately 250 residents in 120 two and three bedroom units. The Battle Road Farms development has a gravity sewer system including two lift stations, which convey through force mains, wastewater to the treatment facility. At the facility the wastewater flows into a septic tank with headworks screening, then to an alarmed equalization tank. Infiltration and inflow flows entering the sewer system during wet weather periods are currently reported to be minimal since repair was made to a sewer pipe connection. The facility's biological treatment process includes in order of treatment; an aerobic RBC with an additional RBC as back-up, an anoxic RBC for denitrification, a secondary clarifier, a tertiary sand filter and a UV system for disinfection. The facility also includes a backup chlorination system should the UV system become inoperable. To ensure adequate denitrification and phosphorus removal, sodium bicarbonate, methanol (approx. 1.5 GPD) and aluminum sulphate (approx. 75 lbs per 5 days) are added during the treatment process. Collected sludge is reduced in an aerobic digester, with periodic pumpings conveyed to the Fitchburg WWTF for disposal.

The final effluent is conveyed and discharged via outfall 001 to an channelized wetland.

II. Description of Discharge

A quantitative description of the facility's discharge in terms of significant effluent parameters based on recent monitoring data is shown in **Table 1**.

III. Limitations and Conditions

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

IV. Permit Basis and Explanation of Effluent Limits Derivation

The Clean Water Act (CWA or the Act) prohibits the discharge of pollutants to waters of the United States without a NPDES permit unless such a discharge is otherwise authorized by the Act. A NPDES permit is used to implement 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.

Waterbody Classification and Usage

The wetland at the point of discharge is classified as a Class B waterbody by the Massachusetts Department of Environmental Protection (MA DEP). This wetland's surface water crosses under a large secondary road to a wetland with no further hydrologic connections. Class B waters are designated 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.

Privately Owned Wastewater Treatment Facility - Effluent Limits Regulatory Basis

Under Section 301(b)(1)(C) of the Clean Water Act (CWA), discharges are subject to effluent limitations based on Water Quality Standards. Also the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, include the 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 or attained.

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that caused, or has reasonable potential to cause, or contributes to an excursion above any water quality criterion [40CFR §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.

Receiving River Flow

Since this discharge is to a wetland, the channelized flow occasionally present is considered intermittent and no dilution can be allowed. Therefore the resulting effluent limits established in the draft permit are stricter than typical with other sanitary wastewater dischargers, such as municipal wastewater treatment facilities (also referred to as Publicly Owned Treatment Works - POTW's).

Conventional Pollutants and Non-Conventional Pollutants

Although EPA has not promulgated effluent guidelines for these privately owned treatment facilities, the secondary treatment requirements set forth at 40 CFR Part 133 for Publicly Owned Treatment Works (POTWs) will serve as a guide for establishing permit limits for this permit. This rationale is consistent with Best Professional Judgement, as described at Section 401(a)(1) of the Clean Water Act.

Following the rationale above, daily maximum effluent limitations for BOD₅, TSS, Fecal coliform bacteria as well as the pH range are based upon State Certification requirements for POTWs under Section 401(d) of the CWA, 40 CFR 124.53 and 124.55, and water quality considerations.

The design flow of the facility is 33,000 gallons per day (GPD) and has been maintained in the permit. The flow limit will be reported as an annual average flow, using monthly average flows from the previous eleven months. During the period from January 2000 to June 2001 (the 'review period'), the monthly average plant flow was approximately 19,000 GPD. A reporting requirement for Maximum Daily flow has been added to the permit.

The BOD and TSS draft limits were established to be stricter than typical secondary treatment requirements due to the discharge to the wetland area. Both parameters have limits of 5 mg/l for average monthly and 10 mg/l for maximum daily. During the review period, BOD has averaged 4.1 mg/l with two minor permit violations. For the same period, the TSS average discharge value was 5.7 mg/l which is above the monthly average limit of 5 mg/l. During this period there are four minor violations for TSS. Based on past performance, the same limits and the current monitoring frequency of twice per month will remain in the draft permit. The draft permit includes average monthly mass limitations requirements based on current state water quality certification requirements. The frequency of monitoring for BOD and TSS remains at 2/Month.

The pH limits of 6.5 to 8.3 S.U. have been retained from the previous permit. The limits reflect the requirements found in 40 CFR 133.102(c) and will result in instream attainment of the state water quality standards of 6.5 to 8.3 S.U. for Class B waters [314 CMR 4.05(3)(b)]. Three minor violations, all below 6.5 S.U., occurred during the review period.

The fecal coliform limits are based on state water quality standards for Class B waters [314 CMR 4.05(b)]. The current permit includes bacteria limits to ensure that water quality standards are met instream. These fecal coliform limits of 200cfu/100 ml and 400cfu/100 ml are consistent with Massachusetts Class B water body requirements and shall continue to be measured once per week. The average fecal coliform reading over the review period was approximately 43 colonies per 100 ml, with two minor violations of the 400/ml maximum daily limit. The draft permit includes a requirement that the fecal coliform samples should be taken at the same time as the total chlorine residual sample is collected, if the back-up chlorination system is being used. Note that the Massachusetts DEP has completed a draft Total Maximum Daily Load (TMDL) study of bacteria for the Shawsheen River basin, dated August 2002. Based on this study's results it has been determined that the Battle Road Farm facility's discharge limitation for fecal coliform bacteria can remain at the existing limits.

Metals

EPA is required to limit any pollutant 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 as specified in the EPA's *Freshwater Metals Criteria for Aquatic Life Protection* (63 FR 68355, December 10, 1998). Results of Whole Effluent Toxicity (WET) testing were also reviewed in the evaluation of metals impacts to the receiving waters (see WET testing discussion below).

The water quality criteria for many metals are dependent upon the hardness of the receiving waters. In this case because the receiving water flow is intermittent, the hardness of the effluent, 40 mg/l, was used.

Copper may be toxic to aquatic life at low concentrations, so applicable 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. A review of past copper concentrations in the effluent during the review period January 2000 through June 2001, a total of 6 samples indicated an effluent average copper concentration of 10 ug/l. Note that the Battle Road Farm development receives its water supply from the town of Lincoln. This water supply system has been raising the pH of the water supply for corrosion control, which helps to limit copper and other metals leaching from copper piping. A similar review was completed during the same period for effluent lead and aluminum concentrations. Sampling results for these metals indicated effluent average concentrations of 5 ug/l for lead and 1.6 mg/l for aluminum.

<i>Parameter</i>	<i>Effluent Concentration Average</i>	<i>Range</i>	<i>Maximum Water Quality Concentration*</i>
Copper, ug/l	9.8	5 - 13	4.3
Lead, ug/l	5	5 - 7	1.0
Aluminum, ug/l	1550	370 - 4910	87

* Based on a Hardness of the effluent of 40 mg/l and no available dilution

Based on reasonable potential that the water quality criteria may be exceeded, the draft permit includes monitoring and reporting limits for total recoverable copper, lead and aluminum.

The limits for total copper have been set at 4.3 ug/l for the average monthly limit and 5.9 ug/l for the daily maximum limit. Copper is limited as total recoverable in accordance with 40 C.F.R. 122.45(c). Note that the draft permit specifies an appropriate method of analysis.

Monitoring and reporting limits for total lead and total aluminum have also been included in the draft permit. The limits for total lead have been set at 1.0 ug/l for the average monthly limit and 25 ug/l for the daily maximum limit. The limits for total aluminum have been set at 87 ug/l for the average monthly limit and 750 ug/l for the daily maximum limit.

The treatment facility uses an additive in the treatment process to assist in the removal of phosphorus. This additive can result in excessive aluminum in the waste stream and discharge. It is anticipated that facility treatment operations will be adjusted to minimize the discharge of aluminum and other metals. Future permit renewals will include a reassessment of the need for these specific discharge limits.

Whole Effluent Toxicity Testing

Under Section 301(b)(1) of the CWA, discharges are subject to effluent limitations based on water quality standards. The State Surface Water Quality Standards [314 CMR 4.05(5)(e)], include the following narrative statements and require that EPA criteria established pursuant to Section 304(a)(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 can contribute toxic constituents to wastewater treatment facilities, including metals, chlorinated solvents, aromatic hydrocarbons and other constituents. EPA policy therefore requires wastewater treatment facilities to perform toxicity bioassays on their effluents. The Commonwealth of MA DEP also requires bioassay toxicity testing for state certification.

The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analysis; (2) bioavailability of pollutants after discharge is measured by toxicity testing including any synergistic effect of pollutants; and (3) pollutants for which there are inadequate analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in connection with pollutant-specific control procedures to control the discharge of toxic pollutants.

Whole effluent toxicity (WET) tests were reviewed for the review period of January 2000 through June 2001 and there were no violations of the permit. Based on these results and current permitting requirements the draft permit has increased the frequency of monitoring to two times per year and reduced the WET testing requirements to one test organism, the daphnid, Ceriodaphnia dubia only. C. dubia has generally been found to be more sensitive than the fathead minnow in WET testing. WET testing shall be conducted in accordance with EPA Region I's protocol found in Attachment A of the draft permit.

EPA-Region I has adopted a species-specific, self-implementing policy for switching to an alternate dilution water during the life of the NPDES permit for WET tests where the receiving water is documented to be toxic or unreliable. The policy authorizes alternate dilution water use:

- (1) in any WET test repeated due to site water toxicity. No prior notification to EPA is required for any current test that needs to be repeated due to site water toxicity; and

- (2) in future WET tests where there are two previously documented incidents of site water toxicity associated with a particular test species. Written notification to EPA is required before switching to alternate dilution water testing for the duration of the life of the permit.

The details this policy are provided in the DMR instructions that are sent out annually.

Chlorine

A UV system provides disinfection at this facility. A backup chlorination disinfection system is installed at the facility, should the UV system become inoperable, therefore a chlorine limit has been maintained in the draft permit. These limits are 11 ug/l for average monthly and 19 ug/l for maximum daily, and apply if the permittee uses its back-up chlorination system.

Nitrogen and Phosphorus

State water quality standards require any existing point source discharge containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practical treatment to remove such nutrients. Nitrogen and phosphorus interferes with water uses and reduces instream dissolved oxygen. Excessive nutrients discharged from the Battle Road Farm's discharge could have significant impacts to the receiving wetlands.

The existing permit includes limits, monitored weekly, for total phosphorus in the discharge. A review of past total phosphorus concentrations in the effluent during the review period between January 2000 and June 2001 indicates an effluent average total phosphorus concentration of 0.8 mg/l, with a range of values between 0.5 - 4.4 mg/l. The phosphorus limit of 1.0 mg/l was exceeded 4 times during the review period.

The existing permit also includes limits, monitored weekly, for total nitrogen in the discharge. A review of past total nitrogen concentrations in the effluent during the review period indicates an effluent average total nitrogen concentration of 3.3 mg/l, with a range of values between 1.2 - 11 mg/l. The nitrogen limit of 5.0 mg/l was exceeded 3 times, with no violations occurring during the review period after June 2000.

To determine, if the Battle Road Farm discharge would adversely impact the receiving wetlands, the permittee provided for annual wetland evaluation reviews. The EPA/MA DEP, during 1998 permit renewal review of these annual evaluations concluded that the receiving wetlands had not been adversely affected by the discharge. Based on wetlands evaluations completed by the permittee since 1998, there continues to be no indication of adverse impacts such as wetland species impacts or stress or other impacts to the wetland community.

Based on the above review the existing permit limits for nitrogen and phosphorus are unchanged in the draft permit.

If, in the future, a Total Maximum Daily Load (TMDL) study or other data becomes available which shows that the treatment facility is contributing to eutrophication within the Shawsheen River watershed, the EPA and DEP may exercise the re-opener clause in Part II.A.4 of this permit and revise the total phosphorus limit.

Effluent Monitoring

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.

Anti-backsliding

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirements of the CWA. The anti-backsliding provisions found in 40 CFR 122.44(l) prohibit the relaxation of permit limits, standards, and conditions. Therefore, the technology-based effluent limits in a reissued permit must be at least as stringent as those in the previous permit. Relaxation is only allowed when cause for permit modification is met (see 40 CFR 122.62). 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, as described in 40 CFR 122.44(l).

Effluent limits based on 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, as described in 40 CFR 122.44(l). Anti-backsliding does not apply to the discontinuance of settleable solids monitoring as there are no limits for this parameter in the current permit.

Outfalls 002 and 003

The existing permit included monitoring requirements for two storm water outfalls on the property. Outfall 002 is an outfall from a retention basin which discharges upstream of Outfall 001 - the wastewater treatment facility. Outfall 003 is a storm water outfall which discharges downstream of Outfall 001. Both outfalls, 002 and 003, currently have twice per year monitoring and reporting requirements for various typical stormwater outfall pollutants of concern. It has been determined that these outfalls were never built and therefore do not exist. This draft permit therefore has eliminated outfall 002 and 003 monitoring and reporting requirements.

V. Sewage Sludge Information and Requirements

The Battle Road Farm wastewater treatment facility generates about 8000 gallons of sludge every three months. This sludge is sent to the East Fitchburg Wastewater Treatment Facility or the Upper Blackstone Water Pollution Abatement District to be incinerated.

Section 405(d) of the CWA requires that EPA develop technical regulations regarding the use and disposal of sewage sludge. These regulations are found at 40 CFR Part 503 and apply to any facility engaged in the treatment of domestic sewage. The CWA further requires that these conditions be

implemented through permits. The sludge conditions in the draft permit are intended to implement these regulations.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA New England has included with the draft permit a 72-page *Sludge Compliance Guidance* document for use by the permittee in determining their appropriate sludge conditions for their chosen method of sludge disposal.

The permittee is also required to submit to EPA an annual report containing the information specified in the *Sludge Compliance Guidance* document for the permittee's chosen method of sludge disposal.

VI. 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 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 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.

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

VII. State Certification Requirements

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection 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 Massachusetts Department of Environmental Protection has reviewed the draft permit and advised EPA that the permit is adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

VIII. Public Comment Period and Procedures for Final Decision

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection (SPA), 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 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.

IX. 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 the EPA and DEP contacts below:

Suproakash Sarker
 USEPA
 Congress Street
 Suite 1100 (CMA)
 Boston, MA 02114-2023
 Telephone: 617-918-1693

Dana Hill
 Massachusetts Department of Environmental Protection
 Watershed Permitting
 Surface Water Discharge Permit Program
 1 Winter Street
 Boston, Massachusetts 02108
 Telephone: 617-292-5867

 Date

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

Table 1

Effluent Data January 2000 - December 2001
Battle Road Farm Condominiums Wastewater Treatment Facility

Monthly Parameter	Average of Daily Maximums,	Range of Daily Maximums	Number of Violations ¹ <i>Avg. Monthly, Max Daily</i>
Flow (GPD)	19,000	23,000 - 16,000	0
TSS (mg/l)	5.7	14 - 5	4,4
BOD ₅ (mg/l)	4.1	15.6 - 4	2,1
pH (std units)	-----	8.1 - 5.8	3
Total Residual Chlorine (ug/l)	9	9	0,0
Total Nitrogen (mg/l)	3.3	11 - 1.2	3,2
Total Phosphorus (mg/l)	0.8	4.4 - 0.5	4,2
Fecal Coliform (cfu/100ml)	43	428 - 0	0,2
Whole Effluent Toxicity CNOEC chronic		>100%	0
LC ₅₀ , acute		>100%	0
Copper, ug/l	9.8	5 - 13	NA
Lead, ug/l	5	5 - 7	NA
Aluminum, ug/l	1550	370 - 4,910	NA

1 ug/l = 0.001 mg/l

NA = report only, no specific permit limits required

NOTE: Data from NPDES application data, toxicity test reports, and Discharge Monitoring Reports (DMRs) which facility submits monthly. DMR data reviewed from January 2000 to December 2001; the frequency of monitoring varies, as some parameters are measured once per day (e.g. pH) and BOD/TSS are measured 2 times per month and reported as the average of those measurements, and the highest daily maximum value during the month.