

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 WATERS OF THE UNITED STATES.

NPDES PERMIT NO.: **MA0102601**

NAME AND ADDRESS OF APPLICANT:

**Town of West Bridgewater
Board of Selectman
65 North Main Street
West Bridgewater, MA 02379**

**Town of West Bridgewater
School Committee
2 Spring Street
West Bridgewater, MA 02379**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Rose L. MacDonald School Wastewater Facility
Stepping Stone Drive
West Bridgewater, MA 02379**

RECEIVING WATER: **West Meadow Brook (Taunton River Watershed - MA62)**

CLASSIFICATION: **Class B - Warm Water**

I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency for issuance of a new National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving water. An application was submitted May 29, 2002. This permit, after it becomes effective, will expire five (5) years from the effective date.

II. TYPE OF FACILITY, AND DISCHARGE LOCATION

The facility is an elementary school which operates a septic tank, leaching field, and chlorination system for the treatment of wastewater. The discharge is outflow from the leaching field. The effluent is discharged to the West Meadow Brook (See Figure 1).

The facility's discharge outfall is listed below:

<u>Outfall</u>	<u>Description of Discharge</u>	<u>Outfall Location</u>
001	Treated Effluent	West Meadow Brook

III. DESCRIPTION OF THE DISCHARGE

A quantitative description of the effluent parameters based on recent effluent monitoring conducted during the permitting process and discharge monitoring reports (DMRs) as required by MA DEP Administrative Consent Order is shown on Attachments A & B of this fact sheet, respectively.

IV. LIMITATIONS AND CONDITIONS

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

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION**A. PROCESS DESCRIPTION**

The Rose L. MacDonald School is an elementary school. Wastewater from the school is treated by a 15,660 gallon septic tank located in the field next to the school. Two pumps pump from the septic tank via two parallel pipes to two (2) outlet distribution boxes to two filter beds. Overflow from the filter beds flows to the chlorine contact chamber. Chlorine is added manually using tablets. The chlorinated effluent then flows into another manhole, MH#3, where it is combined with storm water from the school and parking lot drains. The wastewater discharge pipe into the manhole is in the upper section of the manhole, well above the storm water connection. Sampling for this facility will be done from the pipe discharging into this manhole, labeled as MH#3. Effluent combined with storm water flows from manhole #3 through a 24" concrete line to West Meadow Brook.

As the facility is an elementary school, the discharge is periodic occurring during the 10-month school year, September through June. Sampling for this discharge shall be required September through June or each month there is discharge from the pipe. It is noted that during site visits conducted August 5, 2002 and July 28, 2003, flow was observed from the discharge pipe.

EPA is issuing this permit with the understanding that the Town of West Bridgewater is currently undergoing a comprehensive evaluation of wastewater treatment options under the guidance of MADEP. The permittee will work with the MADEP to develop a schedule of compliance to achieve the effluent limits in the permit. EPA anticipates that the schedule will include interim limits achievable by the existing facility.

B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**1. Overview of Federal and State Regulations**

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 Sections 402 and 301(b) of the Act (see 40 CFR 125 Subpart A) to meet Best Practicable Control Technology Currently Available (BPT), Best Conventional Control Technology (BCT) for conventional pollutants and Best Available Technology Economically Achievable (BAT) for toxic pollutants.

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 Clean Water Act (CWA), discharges are subject to effluent limitations based on Water Quality Standards. The Massachusetts Surface Water Quality Standards 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.

In the absence of technology-based guidelines, EPA is authorized to use Best Professional Judgment (BPJ) to establish effluent limitations, in accordance with Section 402 (a)(1) of the CWA and 40 CFR Section 125.3.

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 [40 CFR §122.44(d)]. 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.

2. Water Quality Standards; Designated Uses; Outfall 001

The receiving water, West Meadow Brook, has been classified as Class B - Warm Water in the Massachusetts Surface Water Quality Standards, 314 CMR 4.05(4)(a). Class B waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. The waters should have consistently good aesthetic value.

A warm water fishery is defined in the Massachusetts Surface Water Quality Standards (314 CMR 4.02) as waters in which the maximum mean monthly temperature generally exceeds 20° Celsius during the summer months and are not capable of supporting a year-round population of cold water stenothermal aquatic life.

Available Dilution

Water quality based limitations are established with the use of a calculated available dilution. Title 314 CMR 4.03(3)(a) requires that effluent dilution 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. Additionally, the facility design flow is used to calculate available effluent dilution.

The facility design flow is 3,050 gallons per day (0.003 mgd) or 0.0047 cubic feet per second. The drainage area contributing to the West Meadow Brook at the point of discharge is approximately 5.2 square miles.

Using streamflow statistics from low-flow partial-record stations located in the Taunton River Basin, which meet the USGS recommended drainage ratio of 0.5 to 1.5, an estimated 7Q10 of 0.035 cubic feet per second per square mile (cfs/m) was determined. Therefore, the estimated 7Q10 for West Meadow Brook at the point of discharge is 0.182 cfs or 117,630 gpd. The dilution factor for the discharge is 38.

$$\text{River flow (7Q10) + Daily average design effluent flow} = \text{Dilution Factor}$$

Daily average design effluent flow

$$\frac{117,630 \text{ gpd}}{3,050 \text{ gpd}} = 38$$

OUTFALL 001 - CONVENTIONAL POLLUTANTS

Biological Oxygen Demand (BOD₅) - The draft limits are based on the requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). The secondary treatment limitations are monthly average BOD₅ concentrations of 30 mg/l, weekly average concentrations of 45 mg/l. The mass limitations for BOD are based on a 3,050 gallon per day design flow.

Total Suspended Solids (TSS) - The draft limits are based on the requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). The secondary treatment limitations are monthly average TSS concentrations of 30 mg/l, weekly average concentrations of 45 mg/l. The mass limitations for TSS are based on a 3,050 gallon per day design flow.

BOD₅ and TSS Mass Loading Calculations:

Calculations of maximum allowable loads for maximum daily, average weekly, and average monthly BOD₅ and TSS are based on the following equation:

$L = C \times DF \times 8.34$ or $L = C \times DF \times 3.79$ where:

L = Maximum allowable load in lbs/day.

C = Maximum allowable effluent concentration for reporting period in mg/l. Reporting periods are average monthly and weekly and daily maximum.

DF = Design flow of facility in MGD.

8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

3.79 = Factor to convert effluent concentration in mg/l and design flow in MGD to kgs/day.

(Concentration limit) [45] X 8.34 (Constant) X 0.003 (design flow) = 1.13 lb/day

(Concentration limit) [45] X 3.79 (Constant) X 0.003 (design flow) = 0.5117 kg/day

(Concentration limit) [30] X 8.34 (Constant) X 0.003 (design flow) = 0.75 lb/day

(Concentration limit) [30] X 3.79 (Constant) X 0.003 (design flow) = 0.3411 kg/day

Eighty-Five Percent (85%) BOD₅ and TSS Removal Requirement - the provisions of 40 CFR §133.102(3) requires that the 30 day average percent removal for BOD and TSS be not less than 85%.

pH - The draft permit includes proposed pH limitations which are required by state water quality standards, and are at least as stringent as pH limitations set forth at 40 CFR 133.102(c). Class B waters shall be in a range of 6.5 through 8.3 standard units and not more than 0.5 standard units outside of the background range. There shall be no change from background conditions that would impair any use assigned to this class.

Fecal Coliform Bacteria - The numerical limitations for fecal coliform are based on state certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53 and 124.55.

These limitations are also in accordance with the Massachusetts Surface Water Quality Standards 314 CMR 4.05 (4)(a)4.a.

The proposed limits in the draft permit are 200 colony forming units (cfu) /100 ml average monthly and 400 colony forming units (cfu)/100 ml maximum daily. The monitoring frequency for fecal coliform is once (1) per week and must be collected concurrent with sampling for Total Residual Chlorine.

OUTFALL 001 - NON-CONVENTIONAL POLLUTANTS

Total Residual Chlorine (TRC) - The draft permit includes total residual chlorine limitations which are based on state water quality standards [Title 314 CMR 4.05(5)(e)]. Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. As such, the permittee should evaluate chlorination alternatives such as ultraviolet disinfection, as well as state of the art chlorination facilities which enable adequate control over chlorine dosing levels. Given the limitation of grab samples for ensuring that chlorine limits are complied with at all times, future permits may require continuous chlorine monitoring to assure that toxic levels are not discharged to the receiving water.

The water quality standards for chlorine defined in the 1998 EPA National Recommended Water Quality Criteria for freshwater are 19 ug/l daily maximum and 11 ug/l monthly average in the receiving water. Given the dilution factor of 38, the total residual chlorine limits have been calculated as 0.7 mg/l maximum daily and 0.42 mg/l average monthly.

Total Residual Chlorine Limitations:

(acute criteria * dilution factor) = Acute (Maximum Daily)
 $(19 \text{ ug/l} \times 38) = 722 \text{ ug/l} = 0.722 \text{ mg/l}$

(chronic criteria * dilution factor) = Chronic (Monthly Average)
 $(11 \text{ ug/l} \times 38) = 418 \text{ ug/l} = 0.418 \text{ mg/l}$

Total Phosphorus - The Massachusetts Surface Water Quality Standards (314 CMR 4.00) do not contain numerical criteria for total phosphorus. The criteria for nutrients is found at 314 CMR 4.05(5)(c), which states that nutrients “shall not exceed the site specific limits necessary to control accelerated or cultural eutrophication”. The Water Quality Standards also require that “any existing point source discharges containing nutrients in concentrations which encourage eutrophication or the growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients (314 CMR 4.04). MADEP has established that a monthly average total phosphorus limit of 0.2 mg/l represents highest and best practical treatment for POTWs.

EPA has produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The 1986 Quality Criteria of Water (“the Gold Book”) recommends in-stream phosphorus concentrations of 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly to lakes or impounds, and 0.025 mg/l within the lake or reservoir.

More recently, EPA has 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 criteria represent conditions in waters in each specific ecoregion which are minimally impacted by human activities, and thus representative of waters without cultural eutrophication. West Bridgewater is within Ecoregion XIV, Eastern Coastal Plains. The total phosphorus criteria for this

Ecoregion XIV is 24 ug/l (0.024 mg/l) and can be founded in the Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV, published in December 2000.

Instream water quality information for West Meadow Brook is scarce. In 2000, the Taunton River Watershed Alliance (TRWA) collected water quality samples throughout the Taunton River Watershed. TRWA sampled one location, West Meadow Brook at Elm Street (downstream of the MacDonald School discharge), monthly during 2000. Results of the sampling can be found in the TRWA Water Quality Monitoring Report 1999-2000, published February 2001. Instream total phosphorus concentrations ranged from 0.01 mg/l to 0.3 mg/l. Six of the samples exceeded the ecoregion criteria of 0.024 mg/l. Two of the samples exceeded the less stringent "Gold Book" criteria of 0.1 mg/l.

As part of the permitting process, the applicant collected three rounds of effluent samples which were analyzed for total phosphorus. The maximum concentration reported was 1.65 mg/l. The calculated instream concentration with a limit of 1 mg/l (1 mg/l divided by the dilution factor of 38) would be 0.026 mg/l, which is slightly higher than the ecoregion criteria but is well within the "Gold Book" criteria of 0.1 mg/l. The draft permit includes a monthly average limit of 1 mg/l.

OUTFALL 001 - WHOLE EFFLUENT TOXICITY (WET)

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 the following narrative statement and requires 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.

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. The Region's current policy is to include toxicity testing requirements in all 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 sewage, and in accordance with EPA national and regional policy, the draft permit includes chronic and 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", September, 1991.)

Pursuant to EPA Region I policy, a minor discharge having a dilution ratio between 20:1 and 100: 1 requires acute toxicity testing once (1) 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.

The draft permit requires that the permittee conduct acute WET testing for the Outfall 001 effluent once(1) per year and that each test include the use of the species, Ceriodaphnia, in accordance with EPA Region I protocol to be found in permit Attachment A.

As a condition of this permit, the testing requirements may be reduced if certain conditions are met. The permit provision anticipates that the permittee may wish to request a reduction in the WET testing. After two 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 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.

VI. SLUDGE CONDITIONS

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 Rose L. MacDonald School septic tank is pumped annually by Claude Dubord and Sons, Inc. Annually, 22,000 gallons of septage is trucked off-site for to treatment at Water Solutions Groups, Taunton, MA.

VII. ANTI-DEGRADATION

The Massachusetts Anti-degradation Policy is found at Title 314 CMR 4.04. All existing uses of the West Meadow Brook must be protected. This permit is being issued to a new discharge. EPA has discussed this draft permit with MA DEP and believes this permit is consistent with the state anti-degradation policy. The public is invited to participate in the anti-degradation finding through the permit public notice procedure.

1. Protection of Existing Uses. In all cases existing uses and level of water quality necessary to protect the existing uses shall be maintained and protected.
2. Protection of High Quality and Other Significant Resource Waters. Certain waters shall be designated for protection under this provision in 314 CMR 4.06(2) and 4.06(3). These include waters whose quality exceeds minimum levels necessary to support national goal uses, low flow waters and other waters whose character cannot be adequately described or protected by traditional criteria. These waters shall be protected and maintained for their existing level of quality unless limited degradation by a new or increased discharge is authorized by the Department. Limited degradation may be allowed by the Department where it determines that a new or increased discharge is insignificant because it does not have the potential to impair any existing or designated water use and cause any significant lowering of water quality; also limited degradation may be allowed as provided in 314 CMR 4.04(4).
3. Protection of Outstanding Resource Waters. Certain waters shall be designated for protection under this provision in 314 CMR 4.06(3) including Public Water Supplies (314 CMR 4.06(1)(d)1.). These waters constitute an outstanding resource as determined by their outstanding socio-economic, recreational, ecological and/or aesthetic values. The quality of these waters shall be protected and maintained.

- a. Any person having an existing discharge to these waters shall cease said discharge and connect to a publicly owned treatment works (POTW) unless it is shown by said person that such a connection is not reasonably available or feasible. Existing discharges not connected to a POTW shall be provided with the highest and best practical method of waste treatment determined by the Department as necessary to protect and maintain the outstanding resource.

- b. A new or increased discharge to an Outstanding Resource Water is prohibited unless:
 - (1) the discharge is determined by the Department to be for the express purpose and intent of maintaining or enhancing the resource for its designated use and a variance from this regulation is granted as provided in 314 CMR 4.04(4). The Department's determination to allow a new or increased discharge shall be made in agreement with the federal, state, local or private entity recognized by the Department as having direct control of the water resource or governing water use; or

 - (2) the discharge is dredged or fill material for qualifying activities in limited circumstances, after an alternatives analysis which considers the Outstanding Resource Water designation and further minimization of any adverse impacts. Specifically, a discharge of dredged or fill material is allowed only to the limited extent specified in 314 CMR 9.00 and 314 CMR 4.06(1)(d). The Department retains the authority to deny discharges which meet the criteria of 314 CMR 9.00 but will result in substantial adverse impacts to the physical, chemical, or biological integrity of surface waters of the Commonwealth.

4. Authorizations.

- a. An authorization to discharge to waters designated for protection under 314 CMR 4.04(2) may be allowed by the Department where the applicant demonstrates that:
 - (1) The discharge is necessary to accommodate important economic or social development in the area in which the waters are located;

 - (2) No less environmentally damaging alternative site for the activity, source for the disposal, or method of elimination of the discharge is reasonably available or feasible;

 - (3) To the maximum extent feasible, the discharge and activity are designed and conducted to minimize adverse impacts on water quality, including implementation of source reduction practices; and

 - (4) The discharge will not impair existing water uses nor result in a level of water quality less than that specified for the Class.

- b. An authorization to discharge to the narrow extent allowed in 314 CMR 4.04(3) may be granted by the Department where the applicant demonstrates compliance with 314 CMR 4.04(4)(a)2. through 4.
 - c. Where an authorization is at issue, the Department shall circulate a public notice in accordance with 314 CMR 2.06. Said notice shall state an authorization is under consideration by the Department, and indicate the Department's tentative determination. The applicant shall have the burden of justifying the authorization. Any authorization granted pursuant to 314 CMR 4.04 shall not extend beyond the expiration date of the permit.
 - d. A discharge exempted from the permit requirement by 314 CMR 3.05(4) (discharge necessary to abate an imminent hazard) may be exempted from 314 CMR 4.04(4) by decision of the Department.
 - e. A new or increased discharge specifically required as part of an enforcement order issued by the Massachusetts Department of Environmental Protection in order to improve existing water quality or prevent existing water quality from deteriorating may be exempted from 314 CMR 4.04(4) by decision of the Department.
5. Control of Eutrophication. From and after the date 314 CMR 4.00 become effective there shall be no new or increased point source discharge of nutrients, primarily phosphorus and nitrogen, directly to lakes and ponds. There shall be no new or increased point source discharge to tributaries of lakes or ponds that would encourage cultural eutrophication or the growth of weeds or algae in these lakes or ponds. 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. Activities which result in the nonpoint source discharge of nutrients to lakes and ponds shall be provided with all reasonable best management practices for nonpoint source control.
 6. Discharge Criteria. In addition to the other provisions of 314 CMR 4.00, any authorized discharge shall be provided with a level of treatment equal to or exceeding the requirements of the Massachusetts Surface Water Discharge Permit Program (314 CMR 3.00). Before authorizing a discharge all appropriate public participation and intergovernmental coordination shall be conducted in accordance with Permit Procedures (314 CMR 2.00).

VIII. STATE PERMIT CONDITIONS

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

IX. STATE CERTIFICATION REQUIREMENTS

The staff of the Massachusetts Department of Environmental Protection ("MADEP") 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.

X. 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, MA Unit, One Congress Street, Suite-1100, Boston, Massachusetts 02114. 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. Public hearings may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates a 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 a hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

XI. 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:

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December 4, 2003
Date

Linda M. Murphy, Director
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