UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
1 CONGRESS STREET
SUITE 1100
BOSTON, MASSACHUSETTS 02203

FACT SHEET

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

NPDES PERMIT NO.: MA0100609

PUBLIC NOTICE DATE: 10/28/02

NAME AND ADDRESS OF APPLICANT:

ATTN: Timothy Henry, Utilities Director
Town of Ipswich Wastewater Treatment Facility
P.O. Box 151
Ipswich, Massachusetts 01938

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Ipswich Wastewater Treatment Facility
20 Fowlers Lane
Ipswich, Massachusetts 01938

RECEIVING WATERS: Greenwood Creek
Ipswich Watershed (92)

CLASSIFICATION: Class SA

I. Proposed Action Type of Facility, and Discharge Location

The above named applicant has requested that the U.S. Environmental Protection Agency reissue its NPDES permit to discharge into the designated receiving waters, the Greenwood Creek, a tributary to the Ipswich River. The facility is engaged in the collection and treatment of domestic and industrial wastewater. The wastewater treatment plant has a design flow of 1.8 MGD.

The current permit was issued on September 30, 1998, and modified on May 24, 2001. The expiration date for the current permit is September 30, 2002. A timely re-application was received.

EPA and MA DEP are currently issuing permits using a watershed approach, such that all NPDES permits in a given watershed are renewed at the same time. This year permits are being issued in the Ipswich watershed.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on recent monitoring data is shown in Attachment A of the fact sheet. Figure 1 of the fact sheet shows the geographic location, and Figure 2 shows the flow process diagram of the facility.

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 Derivation

Facility

The Town of Ipswich operates a secondary wastewater treatment facility that serves approximately 7,700 people. There are currently 2 industrial users contributing wastewater to this facility and no combined sewer overflows.

The Ipswich Wastewater Treatment Facility is an extended aeration activated sludge secondary treatment plant designed for an average daily flow of 1.8 MGD. There are 4 pump stations in Ipswich. The plant has an aerated grit chamber, three extended aeration tanks, two secondary clarifiers, ultraviolet disinfection, and cascade aeration prior to the outfall discharge. Disinfected effluent is discharged through a 5,000 foot long 24-in diameter pipe to a ditch leading to Greenwood Creek, a tributary to the Ipswich River. Sludge from the treatment plant is composted at a regional composting facility and sold as fertilizer.

General Requirements

Under Section 301(b)(1) of the Clean Water Act (CWA), publicly owned treatment works (POTW's) must achieve effluent limitations based on secondary treatment requirements in 40 CFR Part 133.102. Section 301(b)(1)(c) of the CWA requires that effluent limitations based on water quality considerations be established for point source discharges when such limitations are necessary to meet State or Federal water quality standards that are applicable to the designated receiving water.

Pursuant to 40 C.F.R. § 122.44 (d), permittees must achieve water quality standards established under Section 303 of the Clean Water Act (CWA), including state narrative criteria for water quality. Additionally, under 40 C.F.R. § 122.44 (d)(1)(i), "Limitations must control all pollutants or pollutant parameters which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard." When determining whether a discharge causes, or has the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numeric criterion, the permitting authority shall use procedures which account for existing controls on point and non-point sources of pollution, and where appropriate, consider the dilution of the effluent in the receiving water.

Waterbody Classification and Designated Uses

The Greenwood Creek at the point of discharge is classified as a Class SA water in the Massachusetts Water Quality Standards (314 CRM 4.00) by the Massachusetts Department of Environmental Protection (MA DEP). Class SA waters are designated as excellent habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. In approved areas they shall be suitable for shellfish harvesting without depuration (Open Shellfish Areas).

These waters shall have consistently good aesthetic value.

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. This flow is used to calculate available effluent dilution.

Facility design flow is 1.8 MGD or 2.8 cfs
7Q10 is 0

Dilution Factor = (river flow + effluent flow)/effluent flow
Dilution Factor = (0 + 02.8)/2.8 =1

Conventional Pollutants

Biochemical Oxygen Demand (BOD_5), the draft permit limits are based on secondary treatment requirements. The concentration limits in the draft permit are the same as those in the current permit, however BOD_5 mass limits have been added to the draft permit. The limitations are based on the requirements set forth in 40 CFR 133.102(b)(1)(2) and 40 CFR 122.45(f). The monitoring frequency is once per week.

There were no BOD_5, violations at the facility between March 2000 and March 2002.

Total Suspended Solids (TSS), the draft permit limits are based on secondary treatment requirements. The concentration limits in the draft permit are the same as those in the current permit, however TSS mass limits have been added to the draft permit. The limitations are based on the requirements set forth in 40 CFR 133.102(b)(1)(2) and 40 CFR 122.45(f). The monitoring requirements are once per week.

There were no TSS violations at the facility between March 2000 and March 2002.

Expressing limitations in terms of concentration and mass encourages proper operation of a treatment facility. Concentration limits discourage the reduction in treatment efficiency during low discharge flow periods, and mass limits discourage higher loads being discharged into the receiving water during periods of high discharge flow. Regulations found at 40 CFR Section 122.45 do not preclude mass limits, where appropriate, from being included in a NPDES permit. See 40 CFR Section 122.45 (f)(1) and (2). This condition is a state certification requirement.

BOD_5 and TSS Mass Loading Calculations:

Calculations of maximum allowable loads for average weekly, and average monthly 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. 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.

(Concentration limit) [45] X 8.34 (Constant) X 1.8 MGD (design flow) = 675.5 lb/day

(Concentration limit) [30] X 8.34 (Constant) X 1.8 (design flow) = 450.4 lb/day

Eighty-Five Percent (85%) BOD_5 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%. These limits are carried forward from the previous permit.

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 limits on fecal coliform are carried forward from the previous permit reflecting the discharge into a Class SA water body. The proposed limits in the draft permit are 14colony forming units (cfu)/100 ml average monthly and 43(cfu)/100 ml maximum daily. Monitoring is year round. The monitoring frequency for fecal coliform has been continued at five times per week.

Between the months of April 2000 through April 2002, the facility reported 6 violations for monthly average fecal coliform, and 12 violations for maximum daily fecal coliform.

Nonconventional Pollutants

Ammonia-Nitrogen

Effluent limitations for ammonia in the draft permit will remain the same as in the current permit. Ammonia can impact the receiving stream's dissolved oxygen concentration and can be toxic at elevated levels, and the limits on ammonia are based on water quality concerns. The limits during the warm weather season are necessary to maintain the dissolved oxygen water quality criteria of 6 mg/l in the receiving stream.

Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. Due to a change in the water quality standard, the copper effluent limitations in the draft permit are less stringent than the limit in the existing permit. According to Section 402 (o) of the CWA, a permit may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant if information is available which was not available at the time of permit issuance.

The existing permit contains a maximum daily effluent limitation of 2.9 ug/l for copper, and was based on the recommended water quality standard for copper in 1996, and a dilution factor of 1. The copper effluent limitations in the draft permit are based on the most recently issued recommended water quality standards for copper, and a dilution factor of 1. See the Federal Register, Vol.63, No.237, 68354, published December 10, 1998 for the updated water quality standards. The maximum daily effluent limit is 4.8 ug/l and the monthly average is 3.1 ug/ in the draft permit.

Marine Acute Criteria is 4.8 ug/l
Dilution Factor is 1
Maximum daily limit = 4.8 ug/l x 1
Maximum Daily limit is 4.8 ug/l

Marine Chronic Criteria is 3.1 ug/l
Dilution factor is 1
Monthly average limit = 3.1 ug/l x 1
Monthly average limit is 3.1 ug/l

There were twelve reported copper violations between April 2000 and April 2002 at the facility.

Toxicity

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., includes the following narrative statements and requires that EPA criteria established pursuant to Section 304(a) 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 3.14 CMR 4.00 could reasonably be expected to adversely effect 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 industrial and domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Based on the potential for toxicity from domestic and industrial contributions, the state water quality criterion, the level of dilution at the discharge location and in accordance with EPA national and regional policy and 40 C.F.R.122.44(d), the draft permit includes a whole effluent acute toxicity limitation (LC50) and quarterly chronic biomonitoring requirements. (See "Policy for the Development of Water Quality Based Permit Limitations for Toxic Pollutants", 50 Federal Register 30748, July 24, 1985, and EPA's Technical Support Document for Water Quality Based Toxics Control", September, 1985.)

The Massachusetts Department of Environmental Protection's Division of Watershed Management has a current toxics policy which requires toxicity testing for all major dischargers such as the Town of Ipswich WWTF. In addition, EPA recognizes that toxicity testing is

required to assure that the synergistic effect of the pollutants in the discharge does not cause toxicity, even though the pollutants may be at low concentrations in the effluent. Thus, the draft permit includes a whole effluent toxicity limitation requirement for the 001 outfall, to assure that the facility does not discharge combinations of toxic compounds into Greenwood Creek in amounts which would affect aquatic or human life.

Pursuant to EPA Region I policy, discharges having a dilution of less than 10:1 require acute and chronic toxicity testing four times per year. The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is measured by toxicity testing including any synergistics effects of pollutants; and (3) pollutants for which there are inadequate 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 results of the chronic and acute whole effluent toxicity tests have been in compliance with the limits in the existing permit for the period of 8/2001 through 4/2002. Based on the toxicity testing data received, EPA and MA DEP have agreed to reduce the testing from chronic and acute to chronic testing for two species. The permittee is required to test quarterly using only the Silverside (Menidia beryllina) and the Sea Urchin (Arbacia punctulata).

C-NOEC
Dilution Factor - 1.0
1/1 * 100 = 100 %.

Dissolved Oxygen The dissolved oxygen limitation of not less than 6 mg/l will remain in the draft permit. It is a state certification requirement.

Settleable Solids The settleable solids monitoring requirements that are in the existing permit have been removed from the draft permit, since it is no longer a state certification requirement.

V. Infiltration/Inflow Requirements

The draft permit includes requirements for the permittee to control infiltration and inflow (I/I). Infiltration and inflow is extraneous water entering the wastewater collection system through a variety of sources. The permittee shall develop an I/I removal program commensurate with the severity of the I/I collection system. Where portions of the collection system have little I/I, the control program will logically be scaled down.

Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point source such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates and cross connections from storm water systems.

Significant I/I in a collection system may displace sanitary flow reducing the capacity and the efficiency of the treatment works and may cause bypasses to secondary treatments. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows in combined systems.

The permit standard conditions for proper operation and maintenance are found at 40 CFR 122.41(e). These require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. Similarly the permittee has a "duty to mitigate', as stated in 40 CFR 122.41(d). This requires the permittee to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely effecting human health or the environment. EPA and MA DEP maintain that an I/I removal program is an integral component to insuring permit compliance under both of these provisions.

The MA DEP has stated that the inclusion of I/I conditions in the draft permit shall be a standard State Certification requirements under Section 401 of the Clean Water Act and 40 CFR 124.55(b).

VI. Sludge

The permit prohibits any discharge of sludge. Section 405(d) of the Clean Water Act (CWA) requires that sludge conditions be included in all POTW permits. Technical sludge standards required by Section 405 of the CWA were finalized on November 25, 1992 and published on February 19, 1993. The regulations went into effect on March 21, 1993.

The permit requires Ipswich to comply with Federal and State laws and regulations for sludge use and disposal, including the requirements of its Land Application Certificate. The test results now submitted quarterly to the MADEP pursuant to this certificate must also be submitted to EPA.

The Town of Ipswich disposes its sludge at a Town-owned aerated windrow compost facility. It is operated by Agresource Incorporated, and generates approximately 38.5 dry metric tons per year The sludge is composted for approximately two weeks on an aerated windrow pad then, remixed and moved to another pad for an additional two week period. It is then available for sale.

VII. Antibacksliding

Anti-backsliding as defined in 40 CFR 122.44(l)(1) requires reissued permits to contain limitations as stringent or more stringent as those in the pervious permit unless the circumstances allow application of one of he defined exceptions to this regulation. Antibacksliding does not apply when changes to limits are based on new information not available at the time of the pervious permit reissuance, 40 CFR 122.44(l)(2)(i)(B)(1), or when limits are changed as a result of material and substantial additions or alterations to the permitted facility which occurred after permit issuance which justify the application of less stringent limitations, as defined in 40 CFR 122.44(l)(2)(i)(A).

VIII. Antidegradation

The Massachusetts Antidegradation policy is found at Title 314 CMR 4.04. All existing uses of the Greenwood Creek must be protected. This draft permit is being reissued with allowable discharge limits as stringent or more stringent than the current permit with the same parameter coverage except the removal of the settleable solids limitations which is no longer required for State certification. There is no change in the outfall location. The public is invited to participate in the antidegradation finding through the public notice procedure.

IX. State Certification Requirements

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection (MA DEP) with jurisdiction over the receiving waters certify 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 MA DEP has reviewed the permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State and expects that the permit will be certified.

X. Public Comment Period, Public Hearing, and Procedures for Final Decision

All person, including applicants, who believe any condition of the permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, 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 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 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 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 request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of 40 C.F.R. §124.74, 48 Fed. Reg. 14279-14280 (April 1, 1983).

VIII. EPA Contact

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

Betsy Davis
US Environmental Protection Agency
1 Congress Street
Suite 1100 (CPE)
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1576

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

Attachment A - Discharge Data Summary

Attachment A
Ipswich Wastewater Treatment Facility
NPDES 0100609
Discharge Monitoring Data Summary
Ipswich, Massachusetts

	Range between April 2000 and April 2002
Flow, MGD	21.0 - 42.9
Average monthly BOD_5, mg/l	5.8 - 10.7
Average monthly TSS, mg/l	1.7 - 7.3
pH, S.U	6.5 - 7.9
Dissolved Oxygen, mg/l	5.3 - 8.4
Average monthly ammonia nitrogen, mg/l	0.1 - 1.3
Average monthly fecal coliform, MPN	0.5 - 184.9
Copper, Total, ug/l	0.012 - 222.0