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.: **MA0039853**

NAME AND ADDRESS OF APPLICANT:

Town of Wayland
Wastewater Management District Commission
41 Cochituate Road
Wayland, MA 01778

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Town of Wayland Wastewater Treatment Plant
430/440 Boston Post Road
Wayland, MA 01778

RECEIVING WATER: **Wetland adjacent to the Sudbury River**
(Concord River Watershed - 8247650)

CLASSIFICATION: **Class B**

I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency for re-issuance of their National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving water. The current permit expired on October 4, 2003. An application was submitted on April 9, 2003 and an update to that application was submitted on December 5, 2003. This permit will expire five years from the effective date.

II. TYPE OF FACILITY, AND DISCHARGE LOCATION

The facility is engaged in the collection and treatment of wastewater from commercial and residential establishments. The sewer system consists of separate sanitary sewers; the treatment facility provides activated sludge treatment and filtration, and ultraviolet disinfection before discharging to wetlands adjacent to the Sudbury River (See Figure 1).

The facility's discharge outfall information is listed below:

Outfall	Description of Discharge	Outfall Location
001	Treated Effluent	Wetland adjacent to the Sudbury River

EXHIBIT 13

III. DESCRIPTION OF THE DISCHARGE

A quantitative description of the effluent parameters based on recent discharge monitoring reports (DMRs) is shown on Table 1 of this fact sheet.

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 following process description is based on a description provided by Aquarion Services (Aquarion Services 2004).

Wastewater enters the treatment plant from two different influent lines. One is from the Wayland Business Center (6 inch diameter line) which serves three buildings. The second is a 4 inch diameter line from downtown businesses and residences. The two lines each have mini-grinder systems with low pressure pumps. The two lines discharge into a concrete sump which discharges via gravity into the headworks building. There, the influent flow passes through a grinder unit in the 12" wide influent channel. There is also a bypass channel equipped with a bar rack in the event the grinder should fail.

Wastewater then discharges into the aeration basin, where it is mixed with return activated sludge from the secondary clarifiers. The mixture, called mixed liquor suspended solids (MLSS) is mixed and aerated with an air diffuser system. The diffusers are mounted at the bottom of the 11 foot deep tank, and supply oxygen to the bacteria in the MLSS, enabling the aerobic decomposition of pollutants in the wastewater. Sodium aluminate is added during this process for phosphorus removal and pH adjustment. The dissolved oxygen concentration in the aeration tank is controlled by manually regulating the discharge air flow to the aeration tank from the air blowers and by controlling the blowers by timers.

MLSS from the aeration tanks discharges by gravity through a 6 inch diameter line to a circular secondary settling clarifier. Solids settle to the bottom of the clarifier and clarified supernatant discharges over effluent weirs and discharges to a surge chamber. Flow periodically siphons from the surge chamber to the final effluent tank.

Solids which settle in the secondary clarifier are continuously pumped to the aeration basin. This flow is called return activated sludge. Periodically, according to process control considerations, a portion of the settled solids are wasted to an aerobic digester. Digested solids are periodically dewatered and disposed of at the Wayland/Sudbury Septage Plant.

Effluent from the secondary clarifier is pumped from the final effluent tank to a sand filter, where fine particles are removed. Filtered effluent then flows by gravity through an ultraviolet disinfection unit (UV unit) and is discharged to a wetland adjacent to the Sudbury River.

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 Secondary Treatment Best Practicable Control Technology Currently Available (BPT) for Publicly Owned Treatment Works, Best Conventional Control Technology (BCT) for conventional pollutants and Best Available Technology Economically Achievable (BAT) for toxic pollutants (for non-POTWs).

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 (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, 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. <u>Water Quality Standards; Designated Uses; Outfall 001</u>

The receiving water is a wetland adjacent to the Sudbury River which is classified as Class B according to the Massachusetts Surface Water Quality Standards, 314 CMR 4.06 (2)(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.

High Quality Waters include waters whose quality exceeds minimum levels necessary to support the 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).

Water quality impairments have resulted in listing the Sudbury River on the *Massachusetts Year 2002 Integrated List of Waters* (MassDEP 2002), and draft *Massachusetts Year 2004 Integrated List of Waters* (MassDEP 2004), formerly referred to as the 303(d) list. Section 303(d) of the Federal Clean Water Act (CWA) requires states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such, require the development of total maximum daily loads (TMDL). The Sudbury River appears in Category 5 of the 2002 and draft 2004

integrated lists for waters requiring a TMDL. Water quality impairments in the Sudbury River are attributed to metals.

3. **Permit History**

The current permit was issued on September 4, 1998, allowing reactivation of a discharge previously authorized in an NPDES permit issued to the Raytheon Company. The current permit was originally issued to the Wayland Business Center LLC which had renovated the Raytheon facility as office space. The permit authorizes the discharge of treated sanitary wastes, subject to effluent limits and other conditions.

In order to achieve water quality standards, the permit required the permittee to reduce the discharge of phosphorus from other sources within the watershed to offset the 0.125 lbs per day of phosphorus authorized in its permit. A 3/1 offset was required, meaning that the permittee was required to ensure the removal of at least 0.375 lbs per day of phosphorus from other sources. The permit allowed two options for achieving this offset: the permittee could accept a minimum of 4740 gallons per day of wastewater from failed septic systems in the Town of Wayland or it could commit to achieving required phosphorus reductions in the watershed through funding repair of failed septic systems, harvesting of nuisance plants or other phosphorus-releasing materials, or storm water management.

The permittee elected to tie-in failed septic systems in the Town of Wayland. As part of the agreement between the Town and the Wayland Business Center it was agreed that the permit should be transferred to the Town. On November 5, 1999, the permit was transferred.

4. **Available Dilution and Flow Limitation**

In reviewing the permit application and developing the draft permit, EPA became aware that the dilution factor used to develop the limits in the current permit is not protective of water quality standards. While the fact sheet for the current permit clearly states that the discharge is to a wetland adjacent to the Sudbury River, the limits are based on assumption that there is a receiving water flow of 6.2 cfs, which is the 7Q10 of the Sudbury River. In other words, the effluent limits are based on a direct discharge to the Sudbury River, when in fact it is to an adjacent wetland, in which there is no dilution.

At a meeting held on July 13, 2005 with the Wayland Water Commission, EPA explained this issue, and presented water quality based limits protective of the wetland (assuming no dilution) and limits resulting from discharging to the Sudbury River, with 7Q10 flow of 6.2 cubic feet per second (cfs).

Based on these discussions, the Town is currently evaluating, among other options discussed below, whether to continue the discharge to the wetland, subject to the more stringent limits, or to extend the outfall to the Sudbury River subject to limits based on the dilution provided by the river. It is recognized that during the term of the reissued permit, the Town may upgrade their WWTF and relocate the discharge to the Sudbury River. In the event that the Town decides to relocate their outfall to the river during the term of the permit, a second set of limits has been included based on the dilution in the Sudbury River. If, and until the outfall is relocated to the river, the limits appearing in Part I.A.1. will be effective.

During the July 2005 meeting and at a later meeting held on October 5, 2005, the Town inquired into the regulatory requirements for increasing the effluent flow limit. EPA and MassDEP explained DEP's antidegradation policy and the processes associated with authorizing such an increase. Among the requirements of the antidegradation policy is that the Town show that alternatives to increasing flow, including, but not limited to water

conservation measures, and groundwater discharge at on-site and/or off-site locations are infeasible.

Subsequent to these meetings, in order to evaluate whether an increased discharge from treatment plant could meet water quality standards, EPA conducted an analysis of the permitted sanitary wastewater discharge volumes in the Sudbury-Assabet-Concord (SuAsCo) watershed. Current permits for nine facilities allow 27.4 MGD (42.4 cfs) of sanitary wastewater to be discharged into this watershed. The 7Q10 flow near the mouth of the SuAsCo watershed, at the confluence of the Concord River and Merrimack River, is 22.4 MGD (34.7 cfs). Therefore, based on the permitted allowance of sanitary wastewater discharges (27.4 MGD), during low flow and 7Q10 conditions, the system is dominated by effluent.

Recent water quality data from the reach of the Sudbury River in the vicinity of Wayland indicate that dissolved oxygen levels range from 2.2 mg/l - 11.09 mg/l (supersaturated dissolved oxygen levels were as high as 145% of saturation) and total phosphorus levels ranging from <0.01 mg/l - 0.09 mg/l. Chlorophyll *a* levels were not measured, but duck weed was reportedly abundant in this stretch of the river this summer and /fall. Therefore, given the over-allocation of nutrients of this watershed, and the existing eutrophic conditions, a flow increase at the Wayland WWTF would not be permitted, unless approved after a rigorous antidegradation review. In fact, as will be seen later in the fact sheet, EPA and MassDEP have determined that even at the current flow limit, more stringent limits for total phosphorus are necessary to achieve water quality standards.

5. Effluent Limits Derivation

Dilution Factor

As discussed above, the permit contains two sets of effluent limitations, one for the existing discharge to the wetland and one for a discharge to the Sudbury River. Water quality- based effluent limits are based on a dilution factor calculated using the permitted flow of the treatment facility and the 7Q10 of the receiving water. The 7Q10 is the lowest observed mean river flow for 7 consecutive days recorded over a 10-year recurrence interval. For rivers and streams, Title 314 CMR 4.03(3)(a) requires that 7Q10 be used to represent the critical hydrologic condition at which water quality criteria must be met. The permitted flow is 52,000 gallons per day [0.052 million gallons per day (MGD)]. The annual average daily flow rate was 10,513 gallons per day (gpd) during 2002-2003 (Town of Wayland 2003).

For the discharge to the wetland, a dilution factor of one was used, given that the 7Q10 of a wetland is zero.

For the discharge to the Sudbury River, a 7Q10 flow of 4.01 million gallons per day (MGD) or 6.2 cfs was estimated for the Sudbury River using the USEPA DFLOW 3 program and data recorded from the Saxonville gage (Socolow *et. al.* 2002 in O'Brien-Clayton *et. al.* 2005). This 7Q10 and the permitted flow limit of 0.052 MGD is used to calculate the dilution factor, as follows:

$$\frac{\text{River flow (7Q10)} + \text{Plant Design Flow}}{\text{Plant Design Flow}} = \text{Dilution Factor}$$

$$\frac{4.01\ \text{MGD} + 0.052\text{MGD}}{0.052\ \text{MGD}} = 78.1$$

Effluent Limitations - Conventional Pollutants

The limitations on conventional pollutant are the same for the discharge to the wetlands and to the Sudbury River. It was determined that there is no need for water quality-based limits for biochemical oxygen demand or total suspended solids for either discharge scenario, and the fecal coliform and pH limits are based on water quality criteria in both sets of limits pursuant to state certification requirements.

Biochemical Oxygen Demand (BOD_5) - Publicly Owned Treatment Works (POTWs) are subject to the secondary treatment requirements set forth at 40 CFR 133.102 (a)(1), (2) and 40 CFR 122.45 (f). The secondary treatment limitations are a monthly average BOD_5 concentration of 30 mg/l, and a weekly average concentration of 45 mg/l. The maximum daily concentration shall be reported. The mass limitations for BOD_5 are based on the 52,000 gallon per day design flow.

Total Suspended Solids (TSS) - Publicly Owned Treatment Works (POTWs) are subject to the secondary treatment requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). The secondary treatment limitations are a monthly average TSS concentration of 30 mg/l, and a weekly average concentration of 45 mg/l. The maximum daily concentration shall be reported. The mass limitations for TSS are based on the 52,000 gallon per day design flow.

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:

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

L = Maximum allowable load in lbs/day or kg/day.

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

DQ = 0.052 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) [30] X 0.052 (design flow) X 8.34 (Constant) = 13 lb/day

(Concentration limit) [30] X 0.052 (design flow) X 3.79 (Constant) = 5.9 kg/day (rounded to 6.0 kg/day)

(Concentration limit) [45] X 0.052 (design flow) X 8.34 (Constant) = 19.5 lb/day (rounded to 20 lb/day)

(Concentration limit) [45] X 0.052 (design flow) X 3.79 (Constant) = 8.86 kg/day (rounded to 9 kg/day)

Eighty-Five Percent (85%) BOD_5 and TSS Removal Requirement - the provisions of 40 CFR §133.102 (a)(3) and 40 CFR §133.102 (b)(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 [6.0-9.0 standard units (su)] set forth at 40 CFR 133.102(c). Class B waters shall be in a range of 6.5 su through 8.3 su 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)(b).

The proposed limits in the draft permit are a geometric mean of no more than 200 colony forming units (cfu)/100 ml for the average monthly limit and shall not exceed a daily maximum of 400 colony forming units (cfu)/100 ml for the maximum daily limit. These limits are consistent with Class B surface water quality requirements of the MassDEP. The limitations, and associated monitoring requirements, are in effect year-round given the presence of downstream drinking water intakes.

EFFLUENT LIMITS - NON CONVENTIONAL POLLUTANTS

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). MassDEP 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 that in-stream phosphorus concentrations not exceed 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 impoundments, and 0.025 mg/l within the lake or reservoir.

In December 2000, EPA released "Ecoregional Nutrient Criteria", which was 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. Wayland 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 found in the *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV*, (USEPA 2000).

More recently, Mitchell, Liebman, Ramseyer, and Card (in draft 2004), in conjunction with the New England States, developed potential nutrient criteria for rivers and streams in New England. Using several river examples representative of typical conditions for New England streams and rivers, they investigated several approaches for the development of river and stream nutrient criteria that would be dually protective of designated uses in both upstream reaches and downstream impoundments. Based on this investigation an instream total phosphorus concentration of 0.020 - 0.022 mg/l was identified as protective of designated uses for New England rivers and streams. The development of this New England-wide total phosphorus concentration was based on more recent data than the

National Ecoregional nutrient criteria, and have been subject to quality assurance measures. Additionally, the development of the New England-wide concentration included reference conditions for waters presumed to be protective of designated uses.

While phosphorus is often used as a causal indicator of eutrophication because its presence results in plant growth, chlorophyll *a* is a response indicator. Measures of chlorophyll *a* in surface waters may be correlated with the amount of suspended algae ("phytoplankton"). The recommended total chlorophyll *a* criteria for aggregate Ecoregion XIV streams is 3.75 ug/l (USEPA 2000).

Instream Monitoring Data and Results

As a requirement of the existing permit, instream monitoring data was collected at points upstream and downstream of the WWTF for total phosphorus (TP), chlorophyll *a* (chl *a*), dissolved oxygen (DO), nitrate-nitrogen, nitrite - nitrogen, and pH. Data was reviewed for two monitoring seasons; May through November during 2003 and 2004. See Table Two. The results of this monitoring are indicative of eutrophic conditions in the Sudbury River. For example, average upstream and downstream TP measured 0.083 mg/l and 0.11 mg/l, respectively. Each of these results exceed the recommended Ecoregional Nutrient Criteria (0.024 mg/l), and the New England-wide criteria (0.020-0.022 mg/l). Furthemore, on several occasions, the upstream and downstream TP values exceeded the Gold Book criteria for free-flowing streams (0.1 mg/l), with maximum reported values of 0.53 mg/l and 0.68 mg/l, respectively. Upstream conditions are likely influenced by the Marlborough East WWTF discharge to Hop Brook, a tributary to the Sudbury River upstream of the WWTF, and urban runoff from Framingham, MA.

Chlorophyll *a* results for upstream and downstream locations further indicate that eutrophic conditions exist in the Sudbury River. The average chl *a* concentration for upstream and downstream points was 5.4 ug/l and 6.5 ug/l. These values both exceed the recommended Ecoregional Nutrient Criteria value for chl *a*, 3.75 ug/l (USEPA 2000). Similarly, upstream conditions are likely influenced by the Marlboro East WWTF discharge to Hop Brook, and urban runoff from Framingham, MA.

Proposed Phosphorus Limit

The current permit includes a 0.5 mg/l average monthly limit for TP. Consistent with 314 CMR 4.05(5) and 314 CMR 4.04, and based on the results of the instream monitoring, which demonstrate exceedances of the Gold Book, Ecoregional Nutrient Criteria, and New England-wide criteria, EPA proposes to reduce the average monthly effluent limit to 0.2 mg/l (April 1 - October 31) in the draft permit.

The total phosphorus warm weather limit (0.2 mg/l) is applied April 1st to October 31st. During the warm weather months, it is necessary to limit phosphorus because this is the period when eutrophication is considered most detrimental to water quality goals. The total phosphorus cold weather limit (0.5 mg/l) applies November 1st to March 31st. Limiting phosphorus during the cold weather months is also necessary to ensure that phosphorus discharged during the cold weather months does not result in the accumulation of phosphorus in the sediments, and subsequent release during the warm weather growing season. Finally, a monitoring requirement for orthophosphorus has been included for the cold weather months (November 1 - March 31) in order to determine the particulate fraction.

Metals: Certain metals in water can be toxic to aquatic life. The Massachusetts Water Quality Standards require that surface waters be free from pollutants in concentrations or combinations that are toxic to humans, aquatic animals, or wildlife, and that recommended limits published by EPA pursuant 33U.S.C.12510 Section 304(a) be used as the allowable receiving water concentration for the affected waters, unless a site-specific limit is established. The most current EPA water quality criteria are found in *National Recommended Water Quality Criteria: 2002.*

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 causes, or has "reasonable potential" to cause or contribute to an excursion of any water quality criterion.

In determining reasonable potential, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from the permit application, Monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in *Technical Support Document for Water Quality-based Toxics Controls*, (USEPA 1991) in Section 3; and, where appropriate, (5) dilution of the effluent in the receiving water.

The reasonable potential for metals to cause or contribute to excursions of water quality standards shows there is reasonable potential for aluminum, copper and lead (see evaluations below) for the discharge to the wetland; there is no reasonable potential for any of the metals for the discharge to the Sudbury River.

In order to determine reasonable potential for the discharge of a particular metal to cause or contribute to excursion of water quality standards, an allowable effluent concentration is calculated using the allowable instream concentration from the *National Recommended Water Quality Criteria: 2002* and the appropriate dilution factor. This value is then compared to effluent data from the discharge. If the effluent data shows that the pollutant is discharged at a concentration which has the reasonable potential to exceed the calculated allowable effluent concentrations, then a limit equal to the calculated effluent concentration is included in the permit.

The equation used to calculate the allowable effluent concentration is:

$Cd = (Cr)(DF)$

where:

Cd = allowable pollutant concentration in effluent

Cr = allowable instream pollutant concentration (from *National Recommended Water Qaulity Criteria: 2002*)

DF = dilution factor

As discussed previously, the discharge to the wetland has no dilution, so a dilution factor of 1 has been assigned. Thus, for the wetland discharge the above equation is reduced such that the resulting instream pollutant concentration (Cr) is equivalent to the pollutant concentration in the effluent (Cd). The following calculations below, therefore, uses this equation (Cr = Cd) to determine whether there is reasonable potential for individual pollutants to cause or contribute to water quality criteria excursions, and for establishing effluent limitations where reasonable potential is demonstrated.

The calculated dilution factor for the potential discharge to the Sudbury River is 78.1. This dilution factor has been to used in determining whether there is reasonable potential for individual pollutants to cause or contribute to water quality criteria excursions, and for establishing effluent limitations where reasonable potential is demonstrated.

ALUMINUM: TREATED EFFLUENT DISCHARGED TO THE ADJACENT WETLANDS

Aluminum data was provided in the monthly discharge monitoring reports (DMRs) for a review period twenty three months (January 2002 through November 2004). This data was used to

determine whether aluminum may be discharged at a level that causes, or has "reasonable potential" to cause or contribute to an excursion of its water quality criterion.

Given:

Criteria Maximum Concentration (CMC) = 750 ug/l (*National Recommended Water Quality Criteria;* USEPA, 2002)

Criteria Chronic Concentration (CCC) = 87 ug/l (*National Recommended Water Quality Criteria;* USEPA, 2002)

Dilution Factor (DF) = 1

Allowable Acute Effluent Concentration:

Cd = Cr* DF

Cd = 750 ug/l * 1 = 750 ug/l

Allowable Chronic Effluent Concentration:

Cd = Cr * DF =

Cd = 87 ug/l * 1 = 87 ug/l

Conclusion: The maximum aluminum concentration discharged during review period was 900 ug/l (see Table One). A concentration of 900 ug/l of aluminum is much greater that the allowable acute and chronic effluent concentrations. Therefore, reasonable potential exists for the discharge of aluminum to cause or contribute to excursions of water quality criteria in the wetland. The allowable chronic and acute effluent concentrations have been included in the draft permit as monthly average and maximum daily limits, respectively.

ALUMINUM: BASED ON TREATED EFFLUENT DISCHARGED TO THE SUDBURY RIVER

Given:

CMC = 750 ug/l (*National Recommended Water Quality Criteria;* USEPA, 2002)

CCC = 87 ug/l (*National Recommended Water Quality Criteria;* USEPA, 2002)

Dilution Factor (DF) = 78.1

Allowable Acute Concentration in Effluent

Cd = Cr* DF

Cd = 750 ug/l * 78.1 = 58,500 ug/l (58.5 mg/l)

Allowable Chronic Concentration in Effluent

Cd = Cr * DF

Cd = 87 ug/l * 78.1 = 6,794.7 ug/l (6.79 mg/l)

Conclusion: The maximum aluminum concentration discharged during review period was 900 ug/l (see Table One). A concentration of 900 ug/l of aluminum is much less than the

allowable acute and chronic effluent concentrations. Therefore, no reasonable potential exists for the discharge of aluminum to cause or contribute to an excursion of water quality criteria in the Sudbury River and no effluent limits will be included for this discharge. Aluminum monitoring will continue as part of Whole Effluent Toxicity (WET) testing.

Water Quality Criteria for Hardness-Dependent Metals: Copper, Nickel, Lead, and Zinc

1. Hardness Values

Water quality criteria for copper, nickel, lead and zinc are hardness dependent. Higher hardness values result in higher (less stringent) criteria. The hardness of the effluent is estimated at 98 mg/l, based on information submitted in conjunction with WET tests. Because the dilution factor for the discharge to the wetland is one, the effluent hardness has been used in these calculations.

For the potential discharge to the Sudbury River, the receiving water hardness of 53 mg/l is used. The receiving water hardness is from WET test data from October 2003, which represents the most conservative value among the WET test data evaluated (October 2002, 2003 and 2004)

2. Acute and Chronic Criteria Calculations for Hardness-Dependent Metals:

The following equations from *National Recommended Water Quality Criteria* (USEPA 2002) were used to determine the acute and chronic criteria for copper, lead, nickel and zinc;

Acute criteria (dissolved) = $\exp\{ m_a [\ln(\text{hardness})] + b_a \}$ (CF)

m_a = pollutant specific coefficient

b_a = pollutant specific coefficient

h = hardness

ln = natural logarithm

CF = pollutant specific conversion factor used to convert total recoverable to dissolved metal

Chronic criteria (dissolved) = $\exp\{ m_c [\ln(\text{hardness})] + b_c \}$ (CF)

m_c = pollutant specific coefficient

b_c = pollutant specific coefficient

h = hardness

ln = natural logarithm

CF = pollutant specific conversion factor used to convert total recoverable to dissolved metal

COPPER

Copper data was taken from sampling analyses that were submitted as part of the yearly WET tests conducted during October 2002, 2003, and 2004. A total of three rounds of samples were collected during this time period. Federal Register, December 10, 1998, National Recommended Water Quality Criteria is used with a hardness of 98 mg/l for treated effluent discharged to the adjacent wetlands and 54 mg/l for treated effluent discharged to the Sudbury River. The maximum copper concentration discharged during review period was 86 ug/l (WET test data for maximum effluent copper concentration; October 2004)

COPPER: TREATED EFFLUENT DISCHARGED TO THE ADJACENT WETLAND

1. Calculation of Acute Criterion and Limit for Copper:

$m_a = 0.9422$ $b_a = -1.700$ CF = 0.960 h = 98

Acute criteria (dissolved) = exp {0.9422 [ln (98)] + -1.700} * (0.960) = 13.186 ug/l

Acute Effluent Limit (dissolved) = 13.186 ug/l * 1 = 13.186 ug/l

Acute Effluent Limit (total recoverable) = 13.186 ug/l/0.960 = 13.74 ug/l**[p17]

2. Calculation of Chronic Criterion and Limit for Copper:

$m_c = 0.8545$ $b_c = -1.702$ CF = 0.960 h = 98

Chronic criteria (dissolved) = exp {0.8545 [ln (98)] + -1.702} * (0.960) = 8.8024 ug/l

Dilution Factor = 1

Chronic Effluent Limit (dissolved) = 8.8024 ug/l * 1 = 8.8024 ug/l

Chronic Effluent Limit (total recoverable) = 8.8024 ug/l / 0.960 = 9.16 ug/l or 9.2 ug/l **[p17]

3. Conclusion: The maximum copper concentration discharged during review period was 86 ug/l (WET test data for maximum effluent copper concentration; October 2004). This concentration of copper is much greater that the allowable acute and chronic effluent concentrations. Therefore, reasonable potential exists for the discharge of copper to cause or contribute to excursions of water quality criteria in the wetland. The allowable chronic and acute effluent concentrations have been included in the draft permit as monthly average and maximum daily limits, respectively.

COPPER: TREATED EFFLUENT DISCHARGED TO THE SUDBURY RIVER

1. Calculation of Acute Criterion and Limit for copper:

$m_a = 0.9422$ $b_a = -1.700$ CF = 0.960 h = 53

Acute criterion (dissolved) = exp {0.9422 [ln (53)] + -1.700} * (0.960) = 7.39 ug/l

Dilution Factor = 78.1

Acute Effluent Limit (dissolved) = 7.39 ug/l * 78.1 = 577.16 ug/l

Acute Effluent Limit (total recoverable) = 577.16 ug/l/0.960 = 601.2 ug/l **[p17]

2. Calculation of Chronic Criterion and Limit for Copper:

$m_c = 0.8545$ $b_c = -1.702$ CF = 0.960 h = 53

Chronic criteria (dissolved) = exp {0.8545 [ln (53] + -1.702} * (0.960) = 5.21 ug/l

Dilution Factor = 78.1

Chronic Effluent Limit (dissolved) = 5.21 ug/l * 78.1 = 406.9 ug/l

Chronic Effluent Limit (total recoverable) = 406.9 ug/l / 0.960 = 423.9 ug/l **[p17]

3. Conclusion: The maximum copper concentration discharged during review period was 86 ug/l (WET test data for maximum effluent copper concentration; October 2004). A concentration of 86 ug/l of copper is much less than the allowable acute and chronic effluent concentrations. Therefore, no reasonable potential exists for the discharge of copper to cause or contribute to an excursion of water quality criteria in the Sudbury River, and no effluent limits will be included for this discharge. Copper monitoring will continue as part of Whole Effluent Toxicity (WET) testing.

LEAD

Lead data was taken from sampling analyses submitted as part of the yearly WET tests conducted during October 2002, 2003, and 2004. A total of three rounds of samples were collected during this time period. Federal Register, December 10, 1998, National recommended Water Quality Criteria is used with a hardness of 98 mg/l for treated effluent discharged to the adjacent wetlands and 54 mg/l for treated effluent discharged to the Sudbury River. The maximum lead concentration discharged during review period was 13 ug/l (WET test data for maximum effluent lead concentration; October 2003).

LEAD: TREATED EFFLUENT DISCHARGED TO THE ADJACENT WETLAND

1. Calculation of acute criterion for lead:

$m_a = 1.273$ $b_a = -1.460$ $h = 98$ CF = 1.46203-[(ln hardness) (0.145712)] = 0.79394

Acute criterion (dissolved)=exp{1.273[ln(98)]+-1.460}*{1.46203-[(ln hardness)(0.145712)](0.960)}
= 63.175 ug/l

Dilution Factor = 1

Acute Effluent Limitation (dissolved) = 63.175 ug/l * 1 = 63.175 ug/l

Acute Effluent Limitation (total recoverable) = 63.175 ug/l/0.79394 = 79.57 ug/l**p17

2. Calculation of Chronic Criterion and Effluent Limit for lead:

$m_c = 1.273$ $b_c = -4.705$ $h = 98$ CF = 1.46203-[(ln hardness) (0.145712)] = 0.79394

Chronic criteria (dissolved) = exp {1.273 [ln (98)] + - 4.705} * 1.46203-[(ln hardness) (0.145712)]
= 2.46186 ug/l

Dilution Factor = 1

Chronic Effluent Limitation (dissolved) = 2.46186 ug/l * 1 = 2.46186 ug/l

Chronic Effluent Limitation (total recoverable) 2.46186 / 0.79394 = 3.10 ug/l**p17

3. Conclusion: The maximum lead concentration discharged during review period was 13 ug/l (WET test data for maximum effluent lead concentration; October 2003). A concentration of 13 ug/l of lead is greater than the allowable chronic effluent concentration (3.10 ug/l). Therefore, a reasonable potential exists for the discharge of lead to cause or contribute to an excursion of water quality criteria in the wetland. The allowable chronic and acute effluent concentrations have been included in the draft permit as monthly average and maximum daily limits, respectively.

LEAD: TREATED EFFLUENT DISCHARGED TO THE SUDBURY RIVER

1. Calculation of Acute Criterion and Effluent Limit for Lead:

$m_a = 1.273$ $b_a = -1.460$ $h = 53$ CF = 1.46203-[(ln hardness) (0.145712)] = 0.8835

Acute criterion(dissolved)=exp{1.273[ln (53)]+-1.460}*{1.46203-[(ln hardness)(0.145712)](0.960)}
= 32.147 ug/l

Dilution Factor = 78.1

Acute Effluent Limitation (dissolved) = 32.147 * 78.1 = 2510.68 ug/l

Acute Effluent Limitation (total recoverable)=2510.68 ug/l / 0.8835 = 2,841.7 ug/l**[p17]

2. Calculation of Chronic Criterion for Lead:

$m_c = 1.273$ $b_c = -4.705$ $h = 53$ CF = 1.46203-[(ln hardness) (0.145712)] = 0.8835

Chronic criterion (dissolved) = exp {1.273 [ln (53)] + -4.705} * 1.46203-[(ln hardness) (0.145712)]
= 1.2527 ug/l

Dilution Factor = 78.1

Chronic Effluent Limitation (dissolved) = 1.2572 ug/l * 78.1 = 97.836 ug/l

Chronic Effluent Limitation (total recoverable) = 97.836ug/l / 0.8835=110.73 ug/l, or 110.7 ug/l**[p17]

3. Conclusion: The maximum lead concentration discharged during review period was 13 ug/l (WET test data for maximum effluent lead concentration; October 2003). A concentration of 13 ug/l of lead is much less than the acute and chronic criteria (2,838.1 ug/l and 110.6 ug/l, respectively). Therefore, no reasonable potential exists for lead to cause or contribute to an excursion of water quality criteria in the Sudbury River. Lead monitoring will continue as part of WET testing.

NICKEL

Nickel data was taken from sampling analyses that were submitted as part of the yearly WET tests conducted during October 2002, 2003, and 2004. A total of three rounds of samples were collected during this time period. Federal Register, December 10, 1998, National recommended Water Quality Criteria is used with a hardness of 98 mg/l for treated effluent discharged to the adjacent wetlands and 54 mg/l for treated effluent discharged to the Sudbury River. The maximum nickel concentration discharged during review period was 10 ug/l (WET test data for maximum effluent lead concentration; October 2003)

NICKEL: TREATED EFFLUENT DISCHARGED TO THE ADJACENT WETLAND

1.Calculation of Acute Criterion and Effluent Limit for Nickel:

$m_a = 0.8460$ $b_a = 2.255$ CF = 0.998 $h = 98$

Acute criterion (dissolved) = exp {0.8460 [ln (98)] + 2.255} * (0.998) = 460.301ug/l

Dilution Factor = 1

Acute Effluent Limitation (dissolved) = 460.301ug/l * 1= 460.301 ug/l

Acute Effluent Limitation(total recoverable) = 460.301ug/l / 0.998 = 461.22 ug/l**p17

2. Calculation of Chronic Criterion and Limit for Nickel:

$m_c = 0.8460$ $b_c = 0.0584$ CF = 0.997 h = 98

Chronic criterion (dissolved) = exp {0.8460 [ln (98)] + 0.0584} * (0.997) = 51.125 ug/l

Dilution Factor = 1

Chronic Effluent Limitation (dissolved) = 51.125 ug/l * 1 = 51.125 ug/l

Chronic Effluent Limitation (total recoverable) = 51.125 ug/l / 0.997 = 51.28 ug/l**p17

3. Conclusion: Based on WET test data, the maximum effluent concentration of nickel, 10 ug/l (WET test October 2003), is lower than the allowable acute and chronic limitations as calculated above. Therefore, no reasonable potential exists for nickel to cause or contribute to an excursion of water quality criteria in the wetland. Nickel will continue to be monitored as a part of the WET testing.

NICKEL: TREATED EFFLUENT DISCHARGED TO THE SUDBURY RIVER

1. Calculation of Acute Criterion and Limit for Nickel:

$m_a = 0.8460$ $b_a = 2.255$ CF = 0.998 h = 53

Acute criterion (dissolved) = exp {0.8460 [ln (53)] + 2.255} * (0.998) = 273.6541 ug/l

Dilution Factor = 78.1

Acute Effluent Limit (dissolved) = 273.6541 ug/l * 78.1 = 21,372.39 ug/l

Acute criterion (total recoverable) = 21,372.39 ug/l / 0.998 = 21,415.2**p17

2. Calculation of Chronic Criterion and Limit for Nickel:

$m_c = 0.8460$ $b_c = 0.0584$ CF = 0.997 h = 53

Chronic criterion (dissolved) = exp {0.8460 [ln (53)] + 0.0584} * (0.997) = 30.3945 ug/l

Dilution Factor = 78.1

Chronic Effluent Limitation (dissolved) = 30.3945 ug/l * 78.1 = 2,373.8

Chronic Effluent Limitation (total recoverable) = 2,373.8 ug/l / 0.997 = 2,380.9 ug/l**p17

3. Conclusion: Based on WET test data, the maximum effluent concentration of nickel, 10 ug/l (WET test October 2003), is lower than the allowable acute and chronic limitations as calculated above. Therefore, no reasonable potential exists for nickel to cause or contribute to an excursion of water quality criteria in the Sudbury River. Nickel will continue to be monitored as a part of the WET testing.

ZINC

Zinc data was taken from sampling analyses that were submitted as part of the yearly WET tests conducted during October 2002, 2003, and 2004. A total of three rounds of samples were collected during this time period. Federal Register, December 10, 1998, National recommended Water Quality Criteria is used with a hardness of 98 mg/l for treated effluent discharged to the adjacent wetlands and 54 mg/l for treated effluent discharged to the Sudbury River. The maximum zinc concentration discharged during review period was 96 ug/l (WET test data for maximum effluent lead concentration; October 2003).

ZINC: TREATED EFFLUENT DISCHARGED TO THE ADJACENT WETLAND

1. Calculation of Acute Criterion for Zinc:

$m_a = 0.8473$ $b_a = 0.884$ CF = 0.978 h = 98

Acute criteria (dissolved) = exp {0.8473 [ln (98)]+ 0.884} * (0.978) = 115.192 ug/l

Dilution factor = 1

Acute Effluent Limitation (dissolved) = 115.192 ug/l * 1 = 115.192 ug/l

Acute Effluent limitation (total recoverable) = 115.192 ug/l/0.978 = 117.78 ug/l**[p17]

2. Calculation of Chronic Criterion for Zinc:

$m_c = 0.8473$ $b_c = 0.884$ CF = 0.986 h = 98

Chronic criteria (dissolved) = exp {0.8473 [ln (98)] + 0.884} * (0.986) = 116.134 ug/l

Dilution factor = 1

Chronic Effluent Limitation (dissolved) = 116.134 ug/l * 1 = 116.134 ug/l

Chronic Effluent Limitation (total recoverable) = 116.134 ug/l / 0.986 = 117.78 ug/l**[p17]

3. Conclusion: Based on the WET test data, the maximum concentration of zinc, 96 ug/l (WET test October 2003) is lower than acute and chronic limitations as calculated above. Therefore, no reasonable potential exists for zinc to cause or contribute to an excursion of water quality criteria in the wetland. Zinc will continue to be monitored as a part of the WET testing.

ZINC: TREATED EFFLUENT DISCHARGED TO THE SUDBURY RIVER

1. Calculation of Acute Criterion and Limit for Zinc:

$m_a = 0.8473$ $b_a = 0.884$ CF = 0.978 h = 53

Acute criteria (dissolved) = exp {0.8473 [ln (53)]+ 0.884} * (0.978) = 68.4280 ug/l

Dilution factor = 78.1

Effluent limitation for dissolved zinc = 68.4280 ug/l * 78.1 = 5,344.2268 ug/l

Effluent limitation for total recoverable zinc = 5,344.2268 ug/l/0.978 = 5,464.4 ug/l**[p17]

ZINC: TREATED EFFLUENT DISCHARGED TO THE SUDBURY RIVER

1. Calculation of Acute Criterion and Limit for Zinc:

$m_a = 0.8473$ $b_a = 0.884$ CF = 0.978 h = 53

Acute criteria (dissolved) = exp {0.8473 [ln (53)]+ 0.884} * (0.978) = 68.4280 ug/l

Dilution factor = 78.1

Effluent limitation for dissolved zinc = 68.4280 ug/l * 78.1 = 5,344.2268 ug/l

Effluent limitation for total recoverable zinc = 5,344.2268 ug/l/0.978 = 5,464.4 ug/l**[p17]

2. Calculation of Chronic Criterion and Limit for Zinc:

$m_c = 0.8473$ $b_c = 0.884$ CF = 0.986 h = 53

Chronic criteria (dissolved) = exp {0.8473 [ln (53)] + 0.884} * (0.986) = 68.9878 ug/l

Dilution factor = 78.1

Effluent limitation for dissolved zinc = 68.9878 ug/l * 78.1 = 5,387.95 ug/l

Effluent limitation for total recoverable zinc = 5,3887.95 ug/l / 0.986 = 5,464.4 ug/l**[p17]

3. Conclusion: Based on the WET test data, the maximum concentration of zinc, 96 ug/l (WET test October 2003) is lower than acute and chronic limitations as calculated above. Therefore, no reasonable potential exists for zinc to cause or contribute to an excursion of water quality criteria in the wetland. Zinc will continue to be monitored as a part of the WET testing.

** The conversion factor is used to determine total recoverable metal. EPA Metal Translator Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion (EPA-823-B96-007) is used as the basis for using the criteria conversion factor. National guidance requires that permit limits be based on total recoverable metals and not dissolved metals. Consequently, it is necessary to apply a translator in order to develop a total recoverable permit limit from a dissolved criteria. The translator reflects how a discharge partitions between the particulate and dissolved phases after mixing with the receiving water. In the absence of site specific data on how a particular discharge partitions in the receiving water, a default assumption is equivalent to the criteria conversion factor used in accordance with the Translator Guidance.

Ammonia: Based on WET test data collected October 2002, 2003, 2004 the maximum effluent ammonia value reported was 1.06 N-mg/l in October 2002. Values of less than 0.1 N-mg/l were recorded for October 2003 and 2004. Given that total ammonia, as nitrogen, was not monitored in the previous permits, insufficient data exists to determine whether permit limits are necessary. Therefore, the draft permit contains monitoring requirement for total ammonia (as nitrogen) on a weekly sampling basis. Data from this monitoring will be used to determine whether future permit limits for ammonia are necessary.

Compliance Schedule: As discussed earlier, the Town is currently evaluating, among other options (i.e., water conservation measures, groundwater discharge etc.), whether to continue the discharge to the wetland or to extend the outfall to the Sudbury River. It is recognized that during the term of the reissued permit, the Town may upgrade their WWTF and/or choose to relocate the discharge to the

Sudbury River. In the event that the Town decides to relocate their outfall to the river during the term of the permit, a second set of limits has been included in the permit. If, and until the outfall is relocated to the river, the limits appearing in Part I.A.1. will be effective.

In order to comply with the limits for total phosphorus, aluminum, copper and lead, the draft permit provides a compliance schedule in Section F. The Permittee is required to evaluate, select and complete construction of the selected option within 4 years of the effective date of the final permit.

As noted in the draft permit, the Permittee shall comply with the limits appearing in Part I.A.1(pages 2 and 3), or alternatively, Part I.A.2. (pages 6 and 7) in accordance with the compliance schedule appearing in Section F. During the interim, a limit of 0.5 mg/l total phosphorus shall apply with monitoring once per week (1/Week). In addition, aluminum, copper and lead shall be monitored once per month (1/Month) using 24 hour composite samples. These interim requirements will be in effect until the conditions of the compliance schedule are completed.

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 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.) Review of the annual WET reports (October 2002, 2003, and 2004) demonstrated that the Wayland WWTF met the LC_{50} limit of 100% for each year. Provided below are WET test requirements based on the discharge of effluent to the adjacent wetland and the Sudbury River. As stated in the draft permit, the limits appearing in Part I.A.2, will apply beginning with the first full calendar month after commencing discharge to the Sudbury River. Until then, limits appearing in the draft permit Part I.A.1 will remain effective.

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.

WET TEST REQUIREMENTS BASED ON EFFLUENT DISCHARGE TO ADJACENT WETLAND

Pursuant to EPA Region I policy, a minor discharge having a dilution ratio of less than 10:1 requires 7-day chronic and modified acute toxicity testing four (4) 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 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 the permittee to conduct 7-day chronic (and modified acute) toxicity tests four times per year, and will test the daphnid, *Ceriodaphnia dubia*. Toxicity test samples will be collected during the second week in March, June, September and December. The test results will be submitted by the last day of the month following the completion of the test. The results are due April 30th, July 31st, October 31st, and January 31st , respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

WET TEST REQUIREMENTS BASED ON TREATED EFFLUENT DISCHARGE TO THE SUDBURY RIVER

The draft permit requires that the permittee conduct acute WET testing for the Outfall 001 effluent once per year and that each test include the use of two species, Ceriodaphnia and Pimphales promelas, in accordance with EPA Region I protocol 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 species used for WET testing. After four consecutive WET tests, which demonstrate 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 draft permit requires that the permittee comply with all existing federal and state laws that apply to sewage sludge use and disposal practices, and with the Clean Water Act Section 405(d) technical standards (see 40 CFR Section 503). Sludge from the Wayland WWTF is currently sent to the Wayland/Sudbury Septage Plant. Because the final disposal or use of the permittees sludge is done by others, the permittee is not subject to the requirements of 40 CFR Section 503. However, if the ultimate sludge disposal method changes, the permittee is responsible for complying with the applicable state and federal requirements.

VII. ANTI-BACKSLIDING

Anti-backsliding, as described in CWA Section 402(o) and at 40 CFR §122.44(l)(1) requires reissued permits to contain limitations as stringent as those of the previous permit unless the circumstances allow application of one of the defined exceptions.

VIII. ANTI-DEGRADATION

The Massachusetts Anti-degradation Regulation is found at Title 314 CMR 4.04. All existing uses of the unnamed wetland adjacent to the Sudbury River, and the Sudbury River, must be protected. This draft permit has discharge limits as stringent, or more stringent, than the current permit with the exception of a maximum daily limit for BOD and TSS, which is now a report-only requirement and a limit for settleable solids which has been eliminated from the permit because MassDEP no longer requires it as a condition for obtaining state certification. There has been no change in the outfall location.

As noted earlier, the existing effluent limits are based on an assumed direct discharge to the Sudbury River, when in fact it discharges to an adjacent wetland, in which there is no dilution. Thus, two sets of limits are proposed in the draft permit to be protective of the wetland, or , if it is later decided to relocate the outfall to the Sudbury River, to be protective of the Sudbury River. The limits proposed for discharging to the wetland are more stringent than existing limits, therefore, antidegradation requirements are met. Also, limits proposed for discharge to the Sudbury River are equally protective as the existing permit. In some cases, the proposed limits for discharge to the Sudbury River are more stringent than the existing permit. Therefore, antidegradation requirements are met for proposed limits set for the discharging to the Sudbury River. Furthermore, if the Town decides to discharge to the Sudbury River, the proposed permit and limits do not authorize any changes in the discharge by adding more pollutants or increasing the discharge to the Sudbury River.

IX. 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. The Sudbury River is not covered by the EFH designation for riverine systems and thus EPA has determined that a formal EFH consultation with NMFS is not required.

X. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in

the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species, where as the National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

As the federal agency charged with authorizing the discharge from this facility, EPA consulted with the USFWS as required under section 7 (a)(2) of the Endangered Species Act (ESA), for potential impacts to federally listed species. Based on a letter received from the USFWS (July 11, 2005), it is EPA's understanding that no federally-listed or proposed, threatened or endangered species or critical habitat, under the jurisdiction of the US Fish and Wildlife Service, are known to occur in the Sudbury River or vicinity of the Wayland WWTF. Furthermore, the effluent limitations and other permit requirements identified in this Fact Sheet are designed to be protective of all aquatic species.

XI. 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 MassDEP Commissioner who has designated signature authority to the Director of the Division of Watershed Management pursuant to M.G.L. Chap. 21, §43.

XII. STATE CERTIFICATION REQUIREMENTS

The staff of the Massachusetts Department of Environmental Protection (MassDEP) 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.

XIV. 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.

XV. 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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U.S. Environmental Protection Agency
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Paul Hogan
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Date

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

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Table 1. Outfall 001 Effluent Characteristics Based on Average Monthly Data

Date	Flow (GPD)		BOD_5 (mg/l)		TSS (mg/l)		Fecal Coliform (cfu/100 ml)		pH (su)		LC50		Total Aluminum (mg/l)	Total Phosphorus (mg/l)	
	MonthlyAverage	Maximum Daily	MonthlyAverage	Maximum Daily	MonthlyAverage	Maximum Daily	Geometric Mean	Maximum Daily	Minimum	Maximum	Ceriodaphina	Pimphales	Report Only 1/month	MonthlyAverage	Maximum Daily
Existing Limits	52000	65000	30	50	30	50	200	400	6.5	8.3	≥100%	≥100%	*****	0.5	***
Jan. 2002	13,515	37,963	18.2	26	19.75	28	<10	<10	7.9	8.2	*****	*****	0.4	0.65	0.95
Feb. 2002	12,516	18,479	6	9	<10	<10	77	3,600	7.5	8.2	*****	*****	0.3	0.287	0.34
Mar. 2002	12,192	17,411	5	7	<10	<10	7.5	66	7.2	8.2	*****	*****	<0.2	0.32	0.40
Apr. 2002	12,199	16,928	2.6	3	<10	<10	<2	<2	7.2	8.0	*****	*****	<0.2	0.267	0.32
May. 2002	13,015	19,813	3	3	<10	<10	<2	<2	7.2	8.1	*****	*****	<0.2	0.212	0.25
June 2002	12,723	19,044	<2	<2	<10	<10	<2	<2	7.0	7.9	*****	*****	0.4	0.255	0.34
July 2002	13,350	22,537	<2	<2	<10	<10	<2	<2	7.1	7.8	*****	*****	<0.2	0.26	0.30
Aug. 2002	15,514	25,164	<2	<2	<10	<10	<2	<2	6.9	7.6	*****	*****	<0.2	0.30	0.46
Sept. 2002	9,857	15,684	<2	<2	<10	<10	<2	<2	6.6	7.5	*****	*****	<0.2	0.437	0.71
Oct.. 2002	7,611	12,564	3	3	<10	<10	<2	4	6.5	7.3	>100	>100	<0.2	0.55	0.58
Nov. 2002	7,190	12,332	3	4	<10	<10	<2	<2	6.6	7.6	*****	*****	0.9	0.35	0.46
Dec. 2002	6,662	9,763	5	7	<10	<10	4.5	54	6.7	7.6	*****	*****	<0.2	0.21	0.25
Jan. 2003	7,537	11,626	5.2	6	<10	<10	4.53	125	7.1	8.1	*****	*****	<0.2	0.33	0.44
Feb. 2003	7,311	12,083	9.5	15	11.5	12	14.7	146	7.1	7.6	*****	*****	<0.2	0.552	0.72
Mar. 2003	9,316	13,838	10	13	11	11	<2	<2	7.2	7.8	*****	*****	<0.2	0.48	0.73
Apr. 2003	11,807	23,046	4	6	<10	<10	<2	<2	6.6	7.7	*****	*****	<0.2	0.358	0.68

Date	Flow (GPD)		BOD_5 (mg/l)		TSS (mg/l)		Fecal Coliform (cfu/100 ml)		pH (su)		LC50		Total Aluminum (mg/l)	Total Phosphorus (mg/l)	
	Monthly Average	Maximum Daily	Monthly Average	Maximum Daily	Monthly Average	Maximum Daily	Geometric Mean	Maximum Daily	Minimum	Maximum	Ceriodaphina	Pimphales	Report Only 1/month	Monthly Average	Maximum Daily
Existing Limits	52,000	65,000	30	50	30	50	200	400	6.5	8.3	≥100%	≥100%	*****	0.5	***
May 2003	11,718	22,294	4	7	<10	<10	<2	<2	6.5	7.5	*****	*****	<0.2	0.43	0.50
June 2003	12,486	25,439	2.6	4	<10	<10	<2	<2	6.5	7.3	*****	*****	0.5	0.0648	0.14
July 2003	11,787	19,566	2	2	<10	<10	<2	<2	6.7	7.8	*****	*****	<0.2	0.236	0.42
Aug. 2003	10,179	15,428	3	3	<10	<10	<2	<2	6.8	7.6	*****	*****	<0.2	0.175	0.23
Sept. 2003	8,438	13,050	2.5	3	<10	<10	<2	<2	6.6	7.3	*****	*****	<0.2	0.11	0.14
Oct. 2003	8,618	17,017	6	6	<10	<10	<2	<2	6.7	7.5	>100	>100	<0.02	0.15	0.26
Nov. 2003	6,201	10,024	4	6	<10	<10	<2	6	6.8	7.5	*****	*****	<0.2	0.264	0.32
Dec. 2003	6,514	9,148	3	4	<10	<10	<2	<2	6.8	7.6	*****	*****	<0.2	0.12	<0.05
Jan. 2004	8,231	13,113	7	9	12	12	<2	<2	6.8	7.8	*****	*****	<0.2	0.342	0.43
Feb. 2004	8,602	13,336	8.5	9	11	11	<2	<2	6.9	7.6	*****	*****	<0.2	0.37	0.42
Mar. 2004	8,188	11,454	5.2	7	<10	<10	<2	<2	6.8	7.7	*****	*****	<0.2	0.38	0.54
Apr. 2004	10,585	17,265	4.2	5	<10	<10	<2	<2	6.8	7.8	*****	*****	0.3	0.36	0.42
May 2004	8,217	10,845	3	4	<10	<10	<2	16	6.7	7.5	*****	*****	<0.2	0.34	0.41
June 2004	7,695	11,167	3.4	4	<10	<10	<2	6	6.7	7.4	*****	*****	0.3	0.298	0.38
July 2004	8,012	15,448	3	4	<10	<10	<2	<2	6.7	7.2	*****	*****	<0.2	0.23	0.27
Aug. 2004	9,815	18,225	4.25	5	<10	<10	<2	2	6.9	7.5	*****	*****	<0.2	0.18	0.24
Sept. 2004	11,111	22,006	3	3	<10	<10	6.9	8	6.9	7.7	*****	*****	<0.2	0.284	0.34

Date	Flow (GPD)		BOD_5 (mg/l)		TSS (mg/l)		Fecal Coliform (cfu/100 ml)		pH (su)		LC50		Total Aluminum (mg/l)	Total Phosphorus (mg/l)	
	Monthly Average	Maximum Daily	Monthly Average	Maximum Daily	Monthly Average	Maximum Daily	Geometric Mean	Maximum Daily	Minimum	Maximum	Ceriodaphina	Pimphales	Report Only 1/month	Monthly Average	Maximum Daily
Existing Limits	52,000	65,000	30	50	30	50	200	400	6.5	8.3	≥100%	≥100%	*****	0.5	***
Oct. 2004	8,460	12,855	3.6	5	<10	<10	19.3	82	7.1	8.2	*****	*****	<0.2	0.39	0.90
Nov. 2004	7,881	11,276	3	3	<10	<10	<2	<2	6.8	8.1	*****	*****	<0.2	0.19	0.22
Maximum	15514	37963*	18.2	26	19.75	28	77	3600	7.9	8.2	100	100	0.9	0.65	0.95
Minimum	6201	9148	2	2	10	10	2	2	6.5	7.3	100	100	0.02	0.0648	0.05
Average	10344	17510	4.57	6.04	10.51	10.88	6.43	168.46	6.91	7.72	100	100	0.255	0.307	0.416

Table 2. Instream Monitoring Data

Date	Phosphorus (mg/l)		Chlorophyll *a* (mg/m³)		Dissolved Oxygen (mg/l)		Nitrate-Nitrogen (mg/l)		Nitrite-Nitrogen (mg/l)		pH (su)	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
May 6, 2003 (am)	0.03	0.06	5.0	6.9	*****	*****	0.33	0.30	BRL*	BRL	6.7	6.6
May 6, 2003 (pm)	0.04	0.05	7.3	9.1	*****	*****	0.35	0.29	BRL	BRL	6.8	6.9
May 7, 2003 (am)	0.03	0.07	5.2	9.7	*****	*****	0.36	0.32	BRL	BRL	6.6	6.7
May 7, 2003 (pm)	0.13	0.04	35.9	7.1	*****	*****	0.34	0.32	BRL	BRL	7.3	7.2
May 8, 2003 (am)	0.08	0.04	4.7	5.1	*****	*****	0.36	0.33	BRL	BRL	6.6	6.7
May 8, 2003 (pm)	0.06	0.05	8.4	8.9	*****	*****	0.36	0.34	BRL	BRL	6.7	6.8
June 3, 2003 (am)	0.023	0.11	3.4	0.9	6.8	4.8	0.34	0.12	BRL	0.03	5.8	5.9
June 3, 2003 (pm)	0.051	0.024	3.1	4.0	7.3	5.8	0.13	0.36	BRL	BRL	6.8	6.8
June 4, 2003 (am)	0.10	0.028	3.3	2.6	7.0	4.6	0.33	0.11	BRL	BRL	5.8	6.0
June 4, 2003 (pm)	0.051	0.051	4.4	3.8	6.5	5.0	0.32	0.09	BRL	BRL	6.2	6.3
June 5, 2003 (am)	0.032	0.029	3.2	2.2	6.6	4.5	0.33	0.14	BRL	0.04	5.8	6.0
June 5, 2003 (pm)	0.023	0.027	3.8	4.1	6.5	4.5	0.31	0.15	BRL	BRL	6.2	6.2
July 8, 2003 (am)	0.16	0.19	5.0	3.7	5.8	4.3	0.16	0.15	BRL	BRL	6.7	6.9
July 8, 2003 (pm)	0.13	0.16	14.0	7.1	4.0	4.2	0.17	0.15	BRL	BRL	6.9	6.9
July 9, 2003 (am)	0.15	0.072	11.9	5.7	4.0	2.9	0.23	0.20	0.04	0.03	6.7	6.5
July 9, 2003 (pm)	0.11	0.077	12.3	7.2	4.1	3.1	0.20	0.21	0.03	0.04	6.7	6.7
July 10, 2003 (am)	0.11	0.17	3.6	9.8	4.0	3.0	0.25	0.25	0.03	0.04	6.6	6.7
July 10, 2003 (pm)	0.50	0.15	6.7	14.0	4.6	4.0	0.29	0.26	0.03	0.03	6.5	6.6

Date	Phosphorus (mg/l)		Chlorophyll *a* (mg/m^3)		Dissolved Oxygen (mg/l)		Nitrate-Nitrogen (mg/l)		Nitrite-Nitrogen (mg/l)		pH (su)	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Aug. 5, 2003 (am)	0.09	0.067	3.7	4.2	5.0	4.7	0.23	0.22	0.03	0.03	6.7	6.7
Aug. 5, 2003 (pm)	0.057	0.075	4.0	5.6	5.6	5.3	0.20	0.20	0.05	0.03	6.7	6.7
Aug. 6, 2003 (am)	0.13	0.081	3.6	3.2	5.1	4.7	0.23	0.21	0.02	0.03	6.8	6.7
Aug. 6, 2003 (pm)	0.067	0.12	3.8	37.4	5.2	5.7	0.22	0.18	0.03	0.02	6.6	6.6
Aug. 7, 2003 (am)	0.14	0.077	2.7	8.6	4.6	3.7	0.23	0.18	BRL	0.03	7.0	6.5
Aug. 7, 2003 (pm)	0.13	0.20	8.2	15.5	5.1	5.0	0.21	0.19	BRL	0.03	6.5	6.6
Sept. 2, 2003 (am)	0.18	0.066	5.0	3.0	*****	*****	0.26	0.26	BRL	BRL	7.0	7.0
Sept. 2, 2003 (pm)	0.039	0.059	3.7	6.6	*****	*****	0.23	0.25	BRL	BRL	6.9	6.9
Sept. 3, 2003 (am)	0.037	0.15	6.1	8.7	*****	*****	0.26	0.29	BRL	BRL	6.6	7.1
Sept. 3, 2003 (pm)	0.040	0.053	4.1	14.8	*****	*****	0.30	0.28	BRL	BRL	7.1	7.0
Sept. 4, 2003 (am)	0.048	0.18	6.3	5.0	*****	*****	0.22	0.26	0.08	0.07	6.9	6.9
Sept. 4, 2003 (pm)	0.38	0.68	5.1	5.1	*****	*****	0.19	0.21	0.09	0.08	7.0	6.9
Oct. 7, 2003 (am)	0.06	0.36	4.0	6.6	*****	*****	0.41	0.36	0.05	0.04	6.8	6.9
Oct. 7, 2003 (pm)	0.033	0.071	1.9	6.9	*****	*****	0.40	0.36	BRL	0.04	6.8	7.0
Oct. 8, 2003 (am)	0.53	0.077	2.2	5.6	*****	*****	0.50	0.42	0.06	0.06	6.9	7.0
Oct. 8, 2003 (pm)	0.037	0.061	2.4	9.0	*****	*****	0.36	0.42	0.05	0.04	7.0	7.0
Oct. 9, 2003 (am)	0.058	0.081	3.2	2.3	*****	*****	0.34	0.36	0.04	0.03	7.2	7.3
Oct. 9, 2003 (pm)	0.042	0.084	5.4	4.7	*****	*****	0.60	0.33	0.04	0.03	6.9	6.9
Nov. 4, 2003 (am)	0.039	0.032	3.8	6.5	*****	*****	0.17	0.19	BRL	BRL	6.5	6.8
Nov. 4, 2003 (pm)	0.025	0.034	4.0	8.3	*****	*****	0.16	0.18	BRL	BRL	6.5	6.6

Date	Phosphorus (mg/l)		Chlorophyll *a* (mg/m^3)		Dissolved Oxygen (mg/l)		Nitrate-Nitrogen (mg/l)		Nitrite-Nitrogen (mg/l)		pH (su)	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Nov. 5, 2003 (am)	0.041	0.034	3.3	3.3	*****	*****	0.18	0.17	BRL	BRL	6.8	7.0
Nov. 5, 2003 (pm)	0.032	0.042	3.0	2.9	*****	*****	0.17	0.16	BRL	BRL	6.4	6.6
Nov. 6, 2003 (am)	0.017	0.035	3.8	3.1	*****	*****	0.18	0.15	BRL	BRL	6.5	6.5
Nov. 6, 2003 (pm)	0.054	0.042	3.7	2.9	*****	*****	0.47	0.15	0.02	BRL	6.4	6.4
May 4, 2004 (am)	0.070	0.093	12.8	5.9	*****	*****	0.32	0.14	BRL	BRL	6.5	6.5
May 4, 2004 (pm)	0.028	0.073	5.6	4.4	*****	*****	0.32	0.16	BRL	BRL	7.2	7.3
May 5, 2004 (am)	0.035	0.047	5.9	4.4	*****	*****	0.30	0.18	BRL	BRL	6.5	6.7
May 5, 2004 (pm)	0.028	0.027	5.7	4.4	*****	*****	0.29	0.17	BRL	BRL	7.1	6.9
May 6, 2004 (am)	0.032	0.48	5.7	4.6	*****	*****	0.31	0.23	BRL	BRL	6.6	6.5
May 6, 2004 (pm)	0.031	0.11	6.3	2.5	*****	*****	0.31	0.20	BRL	BRL	7.1	7.0
June 2, 2004 (am)	0.059	0.055	9.1	4.1	7.4	7.1	0.30	0.28	0.03	0.02	6.5	6.5
June 2, 2004 (pm)	0.038	0.52	6.0	4.2	7.6	7.1	0.32	0.29	0.03	0.03	7.1	7.0
June 3, 2004 (am)	0.049	0.12	4.9	13.6	6.8	6.6	0.33	0.29	BRL	0.03	6.8	6.7
June 3, 2004 (pm)	0.039	0.049	2.8	4.3	7.8	7.5	0.29	0.27	BRL	0.02	7.5	6.8
June 4, 2004 (am)	0.043	0.061	2.9	3.5	6.9	6.8	0.31	0.26	BRL	0.02	7.0	6.9
June 4, 2004 (pm)	0.049	0.043	4.2	3.6	7.6	7.8	0.30	0.28	0.02	BRL	6.9	6.9
July 6, 2004 (am)	0.063	0.093	4.7	6.9	5.5	5.6	0.26	0.22	BRL	BRL	6.6	7.2
July 6, 2004 (pm)	0.058	0.065	5.7	7.2	6.6	6.8	0.26	0.22	BRL	BRL	7.0	6.8
July 7, 2004 (am)	0.061	0.070	3.8	5.1	6.2	6.4	0.22	0.19	BRL	0.02	6.7	7.0
July 7, 2004 (pm)	0.054	0.068	5.6	5.8	6.3	6.6	0.23	0.18	0.02	0.02	7.0	7.1

Date	Phosphorus (mg/l)		Chlorophyll *a* (mg/m^3)		Dissolved Oxygen (mg/l)		Nitrate-Nitrogen (mg/l)		Nitrite-Nitrogen (mg/l)		pH (su)	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
July 8, 2004 (am)	0.062	0.058	4.0	5.8	6.1	6.4	0.22	0.21	BRL	BRL	6.9	7.5
July 8, 2004 (pm)	0.069	0.054	7.5	8.2	5.9	7.0	0.19	0.19	0.02	BRL	6.7	6.8
Aug. 3, 2004 (am)	0.14	0.086	3.4	2.0	5.0	4.5	0.15	0.09	0.03	0.08	6.5	6.5
Aug. 3, 2004 (pm)	0.16	0.095	4.1	3.8	5.0	5.7	0.15	0.16	0.03	0.04	7.0	7.0
Aug. 4, 2004 (am)	0.095	0.077	2.9	7.1	5.3	5.7	0.24	0.20	BRL	0.04	7.3	7.3
Aug. 4, 2004 (pm)	0.064	0.085	3.1	4.7	5.5	5.7	0.20	0.21	0.03	0.03	7.0	6.9
Aug. 5, 2004 (am)	0.070	0.053	3.3	2.5	5.1	5.7	0.17	0.20	0.03	0.03	7.0	7.2
Aug. 5, 2004 (pm)	0.061	0.067	3.0	19.7	6.5	6.0	0.18	0.20	BRL	0.03	7.0	6.9
Sept.7, 2004 (am)	0.041	0.042	3.0	4.6	*****	*****	0.14	0.14	BRL	BRL	7.0	6.9
Sept.7, 2004 (pm)	0.018	0.077	2.9	7.2	*****	*****	0.15	0.13	BRL	BRL	7.1	7.2
Sept.8, 2004 (am)	0.076	0.046	3.9	3.9	*****	*****	0.14	0.14	BRL	BRL	6.7	7.4
Sept.8, 2004 (am)	0.067	0.15	4.9	27.5	*****	*****	0.20	0.17	BRL	BRL	7.2	7.1
Sept.9, 2004 (am)	0.56	0.054	7.9	5.0	*****	*****	0.22	0.19	BRL	BRL	7.0	6.9
Sept.9, 2004 (pm)	0.041	0.065	4.2	4.8	*****	*****	0.24	0.21	BRL	BRL	7.0	7.5
Oct. 5, 2004 (am)	0.032	030.7	3.2	3.1	*****	*****	0.18	0.15	BRL	BRL	6.6	6.6
Oct. 5, 2004 (pm)	0.026	0.028	2.8	2.8	*****	*****	0.16	0.14	BRL	BRL	7.0	6.8
Oct. 6, 2004 (am)	0.025	0.035	2.4	2.5	*****	*****	0.18	0.15	0.03	0.02	6.7	6.6
Oct. 6, 2004 (pm)	0.047	0.14	3.9	4.3	*****	*****	0.18	0.17	0.03	BRL	6.7	6.8
Oct. 7, 2004 (am)	0.093	0.067	7.3	5.3	*****	*****	no sample	0.18	0.21	BRL	6.5	7.1
Oct. 7, 2004 (pm)	0.036	0.026	3.1	3.1	*****	*****	.018	0.15	0.02	0.02	6.3	7.3

Date	Phosphorus (mg/l)		Chlorophyll *a* (mg/m^3)		Dissolved Oxygen (mg/l)		Nitrate-Nitrogen (mg/l)		Nitrite-Nitrogen (mg/l)		pH (su)	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Nov. 2, 2004 (am)	0.22	0.034	2.0	3.6	*****	*****	0.17	0.20	BRL	BRL	6.7	7.2
Nov. 2, 2004 (pm)	0.022	0.059	2.1	4.3	*****	*****	0.19	0.21	BRL	BRL	7.1	7.0
Nov. 3, 2004 (am)	0.051	0.022	2.8	2.1	*****	*****	0.26	0.23	BRL	BRL	6.5	6.8
Nov. 3, 2004 (pm)	0.023	0.038	1.6	2.4	*****	*****	0.21	0.24	BRL	BRL	7.6	7.2
Nov. 4, 2004 (am)	0.23	0.055	1.0	4.8	*****	*****	0.19	0.20	BRL	BRL	6.7	6.8
Nov. 4, 2004 (pm)	0.018	0.046	1.5	3.3	*****	*****	0.19	0.20	BRL	BRL	7.1	7.1
Maximum	0.53	0.68	35.9	37.4	7.8	7.8	0.6	0.42	0.09	0.08	7.5	7.3
Minimum	0.017	0.024	1.9	0.9	4	2.9	0.13	0.09	0.02	0.02	5.8	5.9
Average	0.0851	0.108	5.72	6.51	5.9	5.1	0.29	0.237	0.041	0.036	6.71	6.74

*BRL: Below reporting limit.

*****: sampling not required for dissolved oxygen during September, October, November and May.