

Response to Public Comments

From November 16, 2005 to December 15, 2005, the United States Environmental Protection Agency (“EPA”) and the Massachusetts Department of Environmental Protection (“MassDEP”) (together, the “Agencies”) solicited public comments on a draft NPDES permit developed pursuant to a permit renewal application from the Town of Northbridge, Massachusetts (“Permittee”) for the reissuance of a National Pollutant Discharge Elimination System (“NPDES”) permit to discharge treated domestic sewerage effluent from Outfall 001 to an unnamed tributary to the Blackstone River.

This response to comments briefly describes and responds to the comments received by the Agencies during the public comment period and describes the changes that have been made to this permit from the draft upon consideration of the comments. Copies of the final permit (“Permit”) may be obtained by writing or calling EPA’s NPDES Municipal Permits Branch (CMP), Office of Ecosystem Protection, 1 Congress Street, Suite 1100, Boston, MA 02114-2023; Telephone: (617) 918-1579.

A) Comments submitted by Camp, Dresser & McKee for the Town of Northbridge:

Comment A1: The Town has determined that compliance with the new phosphorus limits of 0.2 mg/l in the summer and 1.0 mg/l in the winter could require as much as a \$3 million investment and have a significant increase in the Town’s annual operating costs to reduce the amount of phosphorus in its effluent by a tiny amount. The Town has recently completed a \$9 million upgrade to its wastewater facility and a review of this draft permit suggests that there is no new information presented to justify the more stringent limitations. Water Quality data as far back as the early 1990’s is being used in conjunction with literature references from the mid 1980’s and early 1990’s about the possible effects of different levels of phosphorus on receiving streams. These data were available at the time of the last permit.

Response A1: The original phosphorus limit of 1.0 mg/l was based on meeting the minimum dissolved oxygen criteria but it is insufficient to control cultural eutrophication. The criteria for nutrients are found at 314 CMR § 4.04(5) of the Massachusetts Surface Water Quality Standards (MA SWQS), as part of the state’s antidegradation provisions. This section requires that “any existing point source discharge containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients”. After the 1999 permit was issued, the MADEP established that a monthly average total phosphorus limit of 0.2 mg/l represents highest and best practical treatment (HBPT) for POTWs. As noted in the fact sheet, it has been documented that most reaches of the Blackstone River suffer from eutrophication. This phosphorus-driven eutrophication of the Blackstone River prevents attainment of the designated uses as defined in the MASWQS. These uses include habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation.

Comment A2: This WLA study also establishes post implementation activities, when it says: Post implementation monitoring should focus on evaluating sediment oxygen demand (SOD) reduction levels at key locations and the effect of any changes made to Fisherville Dam, as well as how treatment improvements at the WWTF are being translated into water quality improvements in the River. Thus, the Town would have thought that this permit would continue with the 1.0 mg/l limit and would have incorporated more stringent limits only after the recommendations of the WLA had been followed.

Response A2: The WLA was based on meeting minimum DO criteria and not eutrophication criteria. The WLA made some assumptions relative to changes in SOD rates and recommended some follow up monitoring to verify those assumptions. The new permit limit is based on controlling cultural eutrophication and is not dependent on SOD rates.

Comment A3: This permit ignores the work on phosphorus control done by EPA, MassDEP, RIDEM and others to develop the 1.0 mg/l permit limit contained in the Town's current permit. The existing limit of 1.0 mg/l was established using a wasteload allocation (WLA) study and mathematical model of the River and was shown to be protective of the WQS in the receiving water.

Response A3: See response to Comments A1 and A2.

Comment A4: The fact sheet claims that RIDEM conducted modeling to estimate nitrogen loads from Massachusetts sources. In fact, RIDEM conducted no such modeling. RIDEM did analyze data from various sources to reach some general conclusions concerning the sources of nitrogen discharged to RI waters. These conclusions are considered faulty by some, including dischargers in RI who are appealing RIDEM's permit modifications and by the MassDEP, among others.

Response A4: RIDEM used a physical model to evaluate the water quality impairment associated with nitrogen loads. It is clear that the majority of nitrogen loading at the MA/RI state line on the Blackstone River is from POTW effluents and that water quality in Upper Narragansett Bay is impaired by nitrogen.

Comment A5: The discussion on Page 6 of the FS concerning the applicability of 314 CMR 4.04(5) is incorrect. According to the MADEP that section applies only to lakes and ponds. While proceedings are underway to possibly expand the applicability of this section to all waters, such expansion is now only proposed.

Response A5: Part 314 CMR 4.04(5) of the MASQWS cites discharges to lakes and ponds early in this paragraph. However, the sentence that begins, " Any existing point

source discharge containing nutrients in concentrations which encourage eutrophication”, applies to all surface waters and not only to lakes and ponds. Therefore, it is appropriate to apply this standard to this discharge.

Comment A6: The last paragraph on Page 6 of the FS recites information concerning EPA’s ecoregional nutrient criteria and then claims that limits based on those criteria are *not* being established at this time. If the permit writer believes this to be true, then either the discussion does not belong here, or an expanded discussion should be included that would explain why such steps are not now being taken. Such discussion should include information concerning the Commonwealth’s programs for the development of Massachusetts specific nutrient criterion presently being developed and the schedule for completion of this work.

Response A6: The ecoregion criteria were discussed in the fact sheet to establish the range of recommended criteria. We did not use these criteria to establish the effluent limit for this permit because the MassDEP has not yet adopted these as numeric criteria. The MassDEP will be proposing numeric criteria in the future which may be as low as the ecoregion criteria recommendation.

Comment A7: The second paragraph on Page 7 of the FS suggests that EPA has produced a total phosphorus criterion for receiving waters. This is incorrect as the Gold Book referenced here clearly indicates that there is no such criterion. The discussion on phosphate phosphorus concludes with the following, “No national criterion is presented for phosphate phosphorus for the control of eutrophication”. The Gold Book can generally be said to endorse an approach similar to that embodied in the Blackstone River Initiative, which was the basis for the existing 1.0 mg/l summer limit.

Response A7: Although the Gold Book did not establish a national criterion for phosphorus, it did establish guidance which included instream phosphorus levels. The 2002 ecoregion criteria document established recommended national criteria. Both documents are useful for interpreting the narrative criteria for the control of cultural eutrophication that are in the MASWQS. The EPA Gold Book does not endorse controlling cultural eutrophication by focusing solely on achieving minimum DO criteria.

Comment A8: Contrary to the discussion presented on Page 6 of the FS, the top of Page 7 states that the summer time phosphorus limit is based on the State’s HBPT standard. As mentioned above, this is not now a water quality standard in Massachusetts applicable to streams and thus cannot be used as a rationale for a permit limit.

Response A8: See response to Comment A5.

Comment A9: Page 8 of the FS indicates that the purpose for the 1.0 mg/l winter time phosphorus limit is to prevent higher levels of phosphorus that would otherwise be discharged in the winter from accumulating in the sediments. However, the logic presented in the paragraph clearly supports the conclusion that no winter time limit is warranted: it claims that the vast majority of the phosphorus discharged from the WWTP would be in the form of dissolved, which will pass through the system given the lack of plant growth in the water. Thus, contrary to the assertions of the paragraph, there would be no need for winter time phosphorus control. If the Agency believes that other phosphorus fractions are a water quality problem, it should present calculations showing that these fractions do cause problems, and should compare that to the phosphorus load from all other sources in the same time frame to validate their conclusions.

Response A9: The higher winter time limit is a less stringent alternative to applying the 0.2 mg/l limit year round. Without any treatment during the winter, effluent phosphorus loads can contain a significant quantity of particulate phosphorus. Particulate phosphorus is more likely to settle in downstream impoundments and then recycle into the water column, contributing to algae blooms. The treatment required to meet the 1.0 mg/l limit will primarily remove particulate phosphorus leaving predominantly dissolved phosphorus in the effluent. The winter limit is intended to protect the water quality gains associated with the summer limit. Additional sources may also need to be controlled to prevent accumulation of phosphorus in the river sediments.

Comment A10: The Town has had exemplary compliance with the coliform standard, with only one violation in the last 2 years. Thus, we think that the additional sampling for coliform called for in this permit is an unwarranted expense. Accordingly, it is requested that the testing level be maintained at twice per week, consistent with the existing permit.

Response A10: The test for fecal coliform is inexpensive and we have determined that more frequent sampling is required due to the variability of fecal coliform in the discharge. Although there was only one violation in the 2 year period reviewed for the draft permit, the rest of the data was quite variable. The primary focus of monitoring requirements is to ensure that the treatment system is capable of maintaining compliance with permit limits at all times. To this end, increased monitoring frequency can be useful and can serve as an early indicator to the POTW personnel of any decreased effectiveness of its UV disinfection system that may require corrective measures.

B) Comments by Cindy Delpapa of the Riverways Program of the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement:

Comment B1: We would like to recommend an addition to the permit that requires the permittee to maximize phosphorus removal at all times to further strengthen the permit requirements.

Response B1: Language in Part 1.A.12 of the permit states, “Consistent with Section B.1 of Part II of the Permit, the Permittee shall properly operate and maintain the phosphorus removal facilities in order to obtain the lowest effluent concentration possible.” We believe that this is consistent with the commenter’s request. Also refer to the response to Comment A9 which discusses the establishment of a winter phosphorus limit of 1.0 mg/l.

Comment B2: While it is likely the dissolved oxygen (DO) in the effluent fluctuates markedly through the day it still would be preferable to coordinate the DO sampling with the most stressed time in the receiving water and require a morning grab sample. We would like to see continued monitoring of the effluent should the routine grab sample show DO concentrations below the permit limitation. Ideally, monitoring would be required until such time as the effluent reaches acceptable DO concentrations.

Response B2: We believe that the once per week DO monitoring requirement with a minimum level of 5.0 mg/l is sufficient. A requirement to monitor effluent DO at a particular time or to conduct instream DO monitoring is not required at this time. The permittee has exhibited acceptable compliance history for DO, with only 2 minor violations in the 2 year period analyzed for the draft permit. Although the receiving water may exhibit daily fluctuations in DO, we do not expect there to be significant variability in effluent DO.

Comment B3: While Northbridge may have a relatively small percent contribution of nitrogen loading to the overall Narragansett Bay loadings, it is important to control all sources to the extent possible. Any reduction in nitrogen loading can only help to bring about improvements to the Bay. We hope the permittee will, at a minimum, be asked to maximize nitrogen removal at all times to the extent feasible.

Response B3: Based on water quality studies conducted in the Blackstone River basin, it has been found that nitrogen loading associated with this discharge is small relative to other nitrogen loadings from POTWs. Therefore, EPA has determined that nitrogen limits are not appropriate for this facility at this time. However, monthly monitoring for nitrate and nitrite nitrogen and total Kjeldahl nitrogen is required and we believe this monitoring is adequate given the available data outlined in the fact sheet. The Agencies have also determined that optimization for treatment of nitrogen is appropriate during this permit term and specific optimization language has been included in footnote 13 on Page 6 of the final permit. The Agencies also encourage the Town to consider treatment for nitrogen for any future upgrade that it plans and implements.

Comment B4: There have been many instances of extremely elevated copper in the effluent which can adversely affect aquatic organisms in a wastewater dominated brook. Has consideration been given to requiring toxic identification or some other strategy that would address the metals problem in the discharge? Has there been any effort to investigate the impacts that metals may be having on the receiving brook and wetlands?

Since there have been 44 violations of the copper limit in the last 2 years some action is warranted and it would be wise to increase monitoring frequency to better understand the metal loadings released from this facility.

Response B4: The EPA has taken enforcement actions against the Town of Northbridge for its permit violations and with the upgrade that was recently completed, the frequency of these violations has decreased. In the meantime, these metals limits have been maintained in the permit. For the period that was analyzed in the fact sheet, the permittee had only one violation of the no observed effect concentration (NOEC) limit for one test specie's toxicity testing. This toxicity testing compliance was ongoing as copper and zinc limits were consistently being exceeded, indicating that these metals were apparently not exhibiting chronic toxic effects in the discharge.

C) Comments submitted by Angelo Liberti of the Rhode Island Department of Environmental Management (RIDEM):

Comment C1: RIDEM requests that EPA add a condition to the draft permit that requires the Town to develop and implement a plan to reduce nitrogen.

Response C1: See response to Comment B3.

Comment C2: The draft permit does not require monitoring or impose an effluent limitation on fecal coliform concentrations during the period of November 1 through March 31. DEM has determined that the discharge of effluent that has not been disinfected from the Northbridge WWTF would result in instream fecal coliform bacteria concentration of approximately 20,000 colony forming units (cfu)/100 ml at the Woonsocket gage in Woonsocket, RI, well in excess of the 200 cfu/ml RI water quality standard. This assumes no background levels of bacteria in the Blackstone River, un-disinfected effluent concentration of 1,000,000 cfu/100 ml. No instream bacteria decay and a 7Q10 low flow computed using data during that period. EPA must require compliance with the effluent limit of 200 cfu/100 ml year round or develop alternative limits that will ensure compliance with the RI WQS.

Response C2: In the draft permit, EPA required seasonal disinfection of this discharge consistent with Massachusetts water quality standards, which allow seasonal disinfection for discharges to Class B waters, and MassDEP's "Implementation Policy for the Control of Toxic Pollutants in Surface Waters" which establishes seasonal disinfection from April 1 through October 15 for segments designated for primary contact.

As RIDEM has asserted, EPA is obligated to ensure that this discharge does not cause or contribute to violations of RI water quality standards, and so must evaluate whether winter limits for bacteria are necessary for this discharge. The applicable RI water quality criteria for bacteria are a geometric mean fecal coliform value not to exceed 200

MPN/100 ml and that 20 % of values are not to exceed 500 MPN/100 ml. RI criteria are in effect year-round.

The analysis provided by RIDEM in its comments, which estimated a fecal coliform count of 20,000 cfu at the Woonsocket gaging station due to the Northbridge WTP discharge is based on very conservative assumptions regarding dilution and bacterial die-off. To confirm whether water quality standards are in fact violated at the state line, EPA reviewed the most recent water quality data collected from the Blackstone River at the state line during months when the MA POTWs were not disinfecting.

The Louis Berger Group conducted water quality sampling for RIDEM in the Blackstone River in 2005 and 2006. The sampling station for this data was in Millville, MA, upstream of the Tupperware Dam. This station was chosen as the last accessible point on the main stem of the Blackstone River prior to its crossing the MA-RI border. This sampling included monthly samples collected during dry weather from November 2005 through February 2006, a period during which the upstream MA POTWs were not disinfecting. Fecal coliform counts of 1700, 1300, 700, and 1700 MPN/100 ml were the highest counts recorded during this period. The geometric mean of these samples is 1273 mpn/100 ml, and all of the samples exceed 500 MPN/100 ml, therefore violating RI water quality standards. During dry weather, the only significant source of fecal coliform bacteria in the river is the upstream POTWs. Therefore, EPA believes that the discharge from the MA POTWs has the reasonable potential to cause or contribute to violations of RI water quality standards, and winter limitations must be included for these NPDES permits.

Based on this information, EPA has determined that winter bacteria limitations are required. Therefore, the fecal coliform limits in the final permit have been extended to be year-round limits.

The Rhode Island comments also included a few suggested minor clarifications to language contained in the fact sheet. These are:

Comment C3: The fact sheet states, “it was found that the nitrogen input from the Northbridge WWTP to the mainstem of the Blackstone River was negligible”. It should be clarified that the monitoring data was actually the more detailed sampling along the Massachusetts portion of the Blackstone River that was conducted by URI on behalf of the Army Corps found in the document entitled: “DRAFT Dry Weather Water Quality Sampling and Modeling Blackstone River Feasibility Study Phase 1: Water Quality Evaluation and Modeling of the MA Blackstone River”.

Response C3: Although the fact sheet cannot be changed after the public comment period, this clarification is noted for the record.

Comment C4: The fact sheet states, “In its Section 305(b) report, the State of RI assessed the health of its receiving waters. Significant nutrient impairments to shellfish harvesting

and swimming, due to nitrogen, were noted in the Providence River, Seekonk River and Upper Narragansett Bay. These waters were given the highest priority consistent with the State of RI's goal of restoring such waters."

These particular impairments are not due to nitrogen. Page III.F-3 of the RI Section 305(b) report states: "The major impacts on designated uses for the estuarine waters of RI are due to bacterial contamination, low DO, and nutrient enrichment. The major sources of bacterial contamination are due to combined sewer overflows (CSOs). CSOs, urban runoff and point source discharges are sources of the nutrient enrichment and low DO problem in the Upper Bay and its coves". Other statements in the fact sheet correctly identify the impact from excessive nitrogen loadings.

Response C4: We agree that we misstated the specific impairments associated with nitrogen loadings. This clarification is noted for the record.

Comment C5: The fact sheet states, "The State of Rhode Island conducted water quality modeling to estimate the nitrogen loading that was being contributed to Upper Narragansett Bay from Massachusetts sources. It was found that WWTFs contributed over 90% of the nitrogen loading to the MA/RI state line". While the above statement is true, perhaps even more compelling is that modeling has shown that MA WWTFs contribute 80% of the loading at the mouth of the Blackstone River (under low flow, design WWTF flows and currently required permit limits for ammonia and phosphorus).

Response C5: We acknowledge this for the record.

D) Comments submitted by Marci Cole of Save the Bay:

Comment D1: The State of Rhode Island is working hard to improve water quality by reducing its nitrogen load to Narragansett Bay. In order to achieve water quality goals in Narragansett Bay, Massachusetts must also reduce its nitrogen loads to the Bay's tributaries. In the case of this permit, while we support the limits on ammonia release and continued monitoring of all nitrogen species, we recommend that the Northbridge WWTF maximize facility operations to reduce the discharge of total nitrogen to the best of their ability. To achieve water quality goals in Narragansett Bay, both RI and MA must continue to enforce strict nitrogen limits at all major WWTFs.

Response D1: See response to Comment B3.

9/5/06