

Response to Public Comments

From December 23, 1998 to February 20, 1999, the United States Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP) solicited Public Comments on 5 draft NPDES permits developed pursuant to applications from the Towns of Millbury, Grafton, Northbridge and Uxbridge and the Upper Blackstone Water Pollution Abatement District for the reissuance of permits to discharge sanitary and industrial wastewater from outfalls to an unnamed brook (a.k.a. Madigan's Brook) for the Town of Northbridge and to the Blackstone River for the other 4 discharges.

After a review of the comments received, EPA has made a final decision to issue these permits authorizing these discharges. The following response to comments describes the changes that have been made to these permits from the drafts and the reasons for these changes and briefly describes and responds to the comments on the draft permits. Copies of the final permits may be obtained by writing or calling EPA Planning and Administration (SPA), JFK Federal Building, Boston, MA 02203; Telephone: (617) 918-1579.

The following parties commented on the permit and the responses to each one's comments begin on the following pages:

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A) Comments submitted by the UBWPAD on 2/18/99:

Comment #1: The configuration of the (Waste Load Allocation) Model on which the limits are based is conceptually flawed. A primary failing of the model is the lack of any relationship between pollutant loads and sediment oxygen demands (SOD) used in the model. The Agency has made no attempt to quantify the relationship between pollutant discharges and SOD reductions that might result in a potential 25% reduction. To the extent that there are reductions in SOD from other sources, comparable reductions ought to have been taken in each of the several other control strategies evaluated by the Agency.

Response: Dissolved oxygen modeling rarely simulates the creation of SOD through settling of oxygen demanding substances. Values for SOD are often selected from the literature and sometimes are measured. In this case SOD rates are based on measured values. The measured values are high but are within the range of literature values and are not unexpected for a river with 14 significant dams and a major pollutant source at the headwaters. The SOD values used in the model are highest in reaches 2-6 which are directly below the UBWPAD discharge and include two major dams and four smaller dams. Values are somewhat lower in reaches 7-10 which include three major dams and four smaller dams. Values are even lower in reaches 11-19 which is a relatively free flowing section of the river including a ten mile stretch that contains no impoundments. Values then increase again below the Woonsocket discharge for a 12.8 mile stretch that includes six significant dams and some of the highest chlorophyll-a values.

The assumption of an improvement in SOD values is not the result of a lack of relationship between loadings and SOD but rather the recognition of the significance of the SOD rates and the fact that SOD improvements have been documented in other rivers. Algal productivity is believed to be a significant contributor to the SOD rates but not the only contributor.

Comment #2: The Model is not adequately calibrated.

Response: The SAB report recommended some modifications to "fine tune" the model calibration. The agencies, in cooperation with URI, have agreed to evaluate these modifications (see response to SAB posted on the EPA web page at www.epa.gov/sab/briresp.pdf). If the modifications result in a significant change to the recommended permit limits, the permits will be reopened.

Adjustments were made to UBWPAD measured loadings to address a much greater than expected reduction in mass loadings for several parameters between the UBWPAD discharge and the first downstream station. It is believed that this shallow rocky reach is functioning in a similar manner as a trickling filter treatment process. While the adjustments were made to reflect actual instream conditions, the river functioning as a treatment process is not acceptable under the Clean Water Act.

Comment #3: The Model's hydraulic configuration is flawed

Response: For a river with as many dams as the Blackstone River has it is a challenge to segment the river without having some mixing of impounded sections with free flowing sections. We believe that the selection of reaches has minimized this problem. Reach 7 and reach 8 are examples where more detailed segmentation may make sense. Reach 7 was chosen to isolate the Quinsigamond River input but includes a portion of Fisherville impoundment with areas downstream of the impoundment. While the Farnumsville dam downstream of the Fisherville dam prevents this area from being totally free flowing, it would have a higher velocity and lower depth than Fisherville impoundment. Splitting reach 7 into two reaches would result in the upper part of the reach being modeled as an impoundment which would decrease the predicted dissolved oxygen sag at reach 7 element 2 and modeling the lower part of the reach as more free flowing would increase the magnitude of the recovery. The issue is similar for reach 8. While splitting these two reaches into four reaches would result in a more accurate model, we do not believe that the difference would be significant. For reaches 22-25 there are five significant dams in an 8 mile stretch which essentially create one continuous impoundment.

The areal increase in the bottom area that results from the imperfect hydraulic relationships represents less than 7% of the total bottom area for the reaches of concern. While the greater bottom area would result in a greater SOD impact it would also result in a greater reaeration rate. The effect on the model results are believed to be insignificant.

Comment #4: Since many of the underlying factors that are based on the hydraulics of the system are nonlinear equations, it is not possible to average these characteristics and accurately represent the River .

Response: See previous response.

Comment #5: The coefficients/rates used in the Model are questionable. Model calibration for BOD appears to contain several errors. By not filtering the BOD samples, the BOD test measured both algal respiration and subsequent algal decay. Hence, the BOD measurements will overestimate the true BOD in the river. It does not appear that any of the BOD tests were inhibited for nitrification. The QUAL2E model does not account for the BOD in algae. The model is inconsistent in having high SOD, but setting the BOD settling rate at 0.0 as settled BOD is the source of SOD. Because of the very low concentrations during monitoring, the BOD decay rate of 0.1 liters/day selected for the calibration of BOD is very tenuous, as stated in the BRI report.

Response: The BOD values instream are very low and not a significant component of the dissolved oxygen dynamics. BOD measurements were inhibited for nitrogen but were not filtered due to resource constraints. The instream BOD measured values did increase slightly as chlorophyll a values increased but were still very low.

Comment #6: The calibration of the nitrogen series is not representative of the data. Simulating nitrogen separately double counts the oxygen demand of nitrification. Secondly, the algal ammonia preference factor is set to 0.0. This forces all ammonia to be consumed through nitrification, overestimating the oxygen demand of the ammonia. Lastly, the decay rate for ammonia is highly variable and often very high.

Response: The oxygen demand of nitrification was not double counted since BOD measurements included nitrogen inhibition. The algal preference factor will be reevaluated as part of further calibration efforts. Nitrification rates are affected by many factors and rates of 1.0 liter/day are within the range of values in the literature.

Comment #7: Organic phosphorus was not measured in the monitoring program. This ignores the large amount of phosphorus that exists in the river system as algae, an important part of the overall phosphorus cycle. This also ignores organic phosphorus for all point sources WWTPs, and tributaries, which again can be a large component of the phosphorus cycle. Secondly, the decay rate of organic phosphorus to ortho phosphorus is very high, set at 0.35 liters/day. This forces all organic phosphorus to be quickly converted to ortho phosphorus and be available for algal growth.

Response: The organic phosphorus is an insignificant component of the total phosphorus in the UBWPAD effluent and is expected to be similar in the other discharges. The SAB commented that including measurements of organic phosphorus would provide a useful check of model calibration. Organic phosphorus measurements were not included due to resource limitations. The organic phosphorus decay rate will be reevaluated as part of the recalibration efforts.

Comment #8: There are several concerns with the rates and parameters selected for stimulating algal dynamics.

Response: See response to Comment A.2.

Comment #9: Because of the above problems in the development and application of the model, the UBWPAD believes that the TMDLs determined by modeling are not based on firm science. Specifically, we object to the proposed inclusion of the following limits in the permit. CBOD (All limits for May), Total Ammonia (All limits for May through November), for total phosphorus (all limits for April through October). In addition, the fact sheet does not adequately present the conditions upon which non-summer limits have been derived.

Response: Further refinements to water quality models can always be made and these refinements will generally provide some marginal improvement in the accuracy of the model. We believe that the model in its current form is scientifically sound and that further refinements will have little effect on the model predictions. Some further refinements have been committed to as discussed above and permits can be reopened if appropriate. It is important to note that permit limits reflect a phased approach and are based on a WLA designed to increase minimum predicted dissolved oxygen levels to 5.0 mg/l. The model indicates that under the permit conditions chlorophyll-a values and diurnal dissolved oxygen variations will still be at levels of concern relative to eutrophication impacts. If these problems persist then more stringent phosphorus limits, such as the highest and best practical treatment based limits that have recently been imposed on other municipal treatment facilities, will need to be implemented. We strongly encourage the Blackstone River facilities, in particular the UBWPAD which represents the single greatest load of phosphorus to the river, to evaluate this potential as part of any facilities planning efforts.

Comment #10: Permit limits for ammonia, CBOD and total phosphorus should be managed according to the temperature in the receiving water.

Response: The limits established in the WLA are based on critical receiving water temperatures. In addition to the maximum summer temperature, seasonal temperatures were evaluated and used to develop seasonal permit limits.

Comment #11: The flow limitation should be calculated as a 12 month moving average

Response: The 56 MGD design flow was based on a projected peak monthly flow value. Accordingly, it is consistent to incorporate this design flow as a maximum monthly average limit.

Comment #12: There is no basis for the TSS limits. The limits should be those required for secondary treatment, or 30 mg/l monthly average and 45 mg/l weekly average. The draft permit states that the Model was used to set these limits. This is incorrect, as neither the Model nor the WLA contain any analyses for TSS limits.

Response: The draft permit was incorrect in stating that the TSS limits are based on the model. The TSS limits are based on state water quality standards related to aesthetics and the protection of the benthic biota. Secondary treatment limits are inappropriate for effluent dominated receiving waters with numerous impoundments such as the Blackstone River.

Comment #13: The computation of the ammonia levels for the months of December to April appears incorrect.

Response: The ammonia limit for December - April is based on an instream criteria of 9.0 mg/l. The critical low flow for this period was estimated at a factor of 1.5 times the summer low flow. The resulting effluent limit was calculated to be 10 mg/l, as the dilution factor was only fractionally higher than that of the summer low flow dilution factor. See response to Comment F.5. Weekly average ammonia limits equal to twice the monthly average limits have been established as recommended by the 1998 Update of Ambient Water Quality Criteria for Ammonia.

Comment #14: All limits for settleable solids should be removed from the permit. This parameter is not associated with any specific water quality parameter, nor is it included in the definition of secondary treatment.

Response: We are removing this parameter from the permit, since it is more a measure of operational control than a water quality concern.

Comment #15: Metals limits should be based on the MA DEP's alternative metal limits procedures.

Response: There is insufficient data on how the discharge partitions between the particulate and dissolved phases in the receiving water to determine a permit limit based on the dissolved metal.

Comment #16: The UBWPAD requests that effluent trading guidelines be included in the permit allowing effluent trading between all sources within the Blackstone River watershed.

Response: We would consider effluent trading proposals and may modify these permits in the future to incorporate any effluent trading which will involve at least a 2 for 1 trade or combination of trades. We would want to see an overall benefit from any trading proposals as well as a high degree of assurance that it will be accomplished within the time frame specified and will achieve the overall benefit proposed. To date, we have not seen any proposals put forth. The final permit includes a reopener clause which could allow us to modify the permit based on any effluent trading mechanisms which are proposed to and eventually approved by the EPA and DEP.

Comment #17: The 7Q10 stream flow is an extreme drought condition. It is inappropriate to assume that a municipal WWTP discharges at its design flow under such a condition in calculating the dilution factor to be used in converting water quality criteria to effluent limitations.

Response: Basing permit limits on a design flow that is less than the permitted flow is a complex issue that has merit in some cases. In an effluent dominated situation such as this it would have little effect on the final permit limits.

Comment #18: The UBWPAD requests that the maximum daily limit for C-NOEC remain as "report" in lieu of being changed to a numeric limit consistent with its existing permit. While the UBWPAD consistently meets the proposed C-NOEC numeric limit, the test for C-NOEC exhibits extreme variability and is under scrutiny by the Agency.

Response: The C-NOEC limit of greater than 90% will remain in the permit. This limit is consistent with EPA Region 1 toxicity policy. The UBWPAD has shown 4 test results between August of 1996 and July of 1998 that have been below this requirement.

Comment #19: Section B of the permit should be deleted as it is inapplicable to the UBWPAD. The UBWPAD does not own or operate the sewer systems which discharge to its facility.

Response: The UBWPAD is responsible for this section as it pertains to the treatment plant, since the plant is considered a part of the sewer system. We understand that the District's member communities own and operate their own systems and are responsible for their maintenance. Therefore, this requirement will remain in the permit. For infiltration and inflow, the District shall work with its member communities to satisfy this requirement and the District will be responsible for submitting the annual I/I report.

Comment #20: Regarding Section C of the permit, we doubt that 3 months is adequate time for the district to meet with the Agency and subsequently develop a revised set of local limits. We request a 6 month time period.

Response: We believe that 3 months is adequate to meet this requirement and this will remain.

Comment #21: Section E (CSO overflows) should be deleted as it is inapplicable

Response: This item was mentioned as a point of fact since the CSO facility in the City of Worcester is in the vicinity of the district's service area. This facility is owned and operated by the Worcester DPW and it provides detention, chlorination and dechlorination of CSO discharges. CSO discharges from small or lower intensity storms are routinely sent to the District, while discharges from most other storm events are pumped to the CSOTF for treatment. Therefore, Section E will remain.

Comment #22: The sludge conditions in the permit should be revised to agree with the new air pollution control equipment that we have installed.

Response: These changes have been made to the final permit.

Comment #23: The facility address should be corrected to read "50 Route 20".

Response: This is acknowledged in this response and changed in the final permit.

Comment #24: The fact sheet incorrectly refers to the UBWPAD facility as an "advanced" wastewater treatment facility. This should be corrected to read "secondary" WTF.

Response: We acknowledge this point of fact in this response, but we cannot change the fact sheet subsequent to the public noticing of the draft permit.

Comment #25: Table 1 of the fact sheet incorrectly indicates that there were 4 violations of the CBOD permit limit during the period August 1996 to July 1998. This should be corrected to read "0" violations

Response: There *were* 4 violations of CBOD during this period. These were in October of 1996, October of 1997 (2) and June of 1998.

B) Comments submitted by the Town of Millbury on 2/9/99:

Comment #1: The flow used in the model is based on projections that the flow from the Millbury WWTF will be 2.7 MGD. This flow number was generated some time ago and is no longer valid. The river model should be rerun using 1.2 MGD in order to provide more valid data on any imposed effluent limits.

Response: The 2.7 MGD figure represents the flow which the Town had previously planned on achieving following earlier facility expansion plans. Since that time, the decision was made by the Town to tie in all of its sanitary flows to the UBWPAD. This model will not be run to reflect the lower flow from the POTW, since these previously proposed higher flows will be instead transferred to the UBWPAD. See the next response regarding the possibility of a compliance schedule.

Comments #2, 3 and 4: If BOD is to be removed to 20 mg/l and ammonia to 5.0 mg/l, extensive modifications will be required to the trickling filter plant. It is estimated that the improvements needed to the secondary process part of the treatment plant would be \$2.6 million and would take at least 4 years to implement. By then, Millbury will have long since decommissioned the plant and sending its flow to the UBWPAD.

The statement in the fact sheet that Millbury has a phosphorus removal system in place is incorrect as Millbury has no such capabilities. To remove phosphorus to a 1.0 mg/l will require that Millbury install a chemical feed system at the primary tanks, which is estimated to cost about \$ 104,000 to design and construct and will take about 18 months to install. This would necessitate an

additional burden of a chemical sludge and its handling. This chemical feed system will increase sludge production by about 50% and require a capital cost of another \$ 300,000 in order to adopt a more labor and capital intensive sludge treatment and handling procedure. These costs do not seem justified since we will be tying in our flow to the UBWPAD within a 36 month period of time after implementing these changes.

The proposal for a dissolved oxygen residual will require the installation of a post aeration tank after the chlorination facilities. The costs of these improvements are estimated at \$217,000 and Millbury feels that this would be an unnecessary financial burden on the town and requests that it be deleted from the permit.

Response: This permit allows for a one year time period for compliance with the phosphorus limit. After that point, a compliance schedule may be developed as needed to allow any necessary additional time to upgrade to meet certain limits or eliminate the discharge. A compliance schedule has not been put into this permit, as the time line for tying in the facility flows to the UBWPAD are uncertain.

Comment #5: The TRC calculation is based on a flow of 2.7 MGD when the actual flow will be 1.2 MGD. Recalculating the TRC limit based on 1.2 MGD results in a chronic value of 0.59 mg/l and an acute value of 1.02 mg/l. Since Millbury meets a 0.5 mg/l residual and the installation of dechlorination facilities is not necessary, the TRC limit should be recalculated for the flow of 1.2 MGD.

Response: These limits have been calculated using the design flow of 1.2 MGD, which is appropriate, since the POTW has decided not to expand its plant capacity and instead to tie in to the UBWPAD over the next 2 to 3 years. Accordingly, the TRC limits, which are based on the dilution factor of 53, have been changed to 0.58 mg/l and 1.0 mg/l for the chronic and acute values, respectively.

Comment #6: The UBWPAD is already involved in BMP activities with its own staff and for Millbury to set up a similar program would be an unnecessary burden. Millbury takes no exception to providing a PPP.

Response: We request that the Town submit the BMP/PPP as required by the permit. Upon reviewing your submittal, we will consider the ongoing activities of the District in order to assure that the work on certain areas will not be duplicative.

Comment #7: The three per week requirement for influent and effluent BOD and TSS is considered to be an excessive amount of sampling and will not provide any long term benefit. Influent BOD and TSS has been relatively stable over the years due to the residential nature of a trickling filter plant.

Response: This sampling is consistent with that of the other Blackstone River dischargers.

Comment #8: The CWMP for Millbury determined that I/I in town is widespread and not cost effective to remove. The town allocates money every year to I/I removal and maintains an active program of sump pump removal and reviews of all new sewer connections for compliance with the town's ordinance.

Response: This is precisely the type of discussion that would satisfy a portion of the annual I/I requirement.

C) Comments submitted by the Town of Uxbridge on 2/19/99:

Comment #1: We feel that removing phosphorus and ammonia at this time may be premature. It may not be fiscally responsible to our users to fund a project that will provide little if any measurable improvement to the Blackstone River. An alternative could be to step our limits down annually towards the desired point in conjunction with UBWPAD's planning and construction stages, so that all facilities on the river reach the necessary limits at about the same time.

Response: Reductions in phosphorus and ammonia discharges will result in incremental improvements and associated environmental benefit to the Blackstone River. The permit allows for a compliance period for phosphorus during the first April to October period. The EPA and DEP had prepared for the permit to be issued before April of 1999, but since it is being issued now and will be effective at about the end of October, the permit has been changed to reflect that the monitoring only period will be from April to October of 2000.

Comment #2: Since the QUAL2E model does not contain any TSS analysis, we feel that this limit was improperly lowered and should be returned to secondary treatment limits of 30 mg/l monthly average and 45 mg/l daily maximum.

Response: See response to comment A.12.

Comment #3: Since we were given a compliance schedule for meeting our new phosphorus limit, we also request a compliance schedule to meet our new ammonia limits.

Response: Your secondary treatment facility should be able to meet the ammonia limits without having to resort to extraordinary plant modifications and expense.

Comment #4: Uxbridge has to date not been adversely affected by I/I. With the programs we have in place and our present low flows, we feel we are aggressively addressing any I/I problems we may have.

Response: The final permit requires that you submit a report by April 1st that describes all of your I/I identification and reduction efforts. There is an annual reporting requirement for I/I issues and activities but you may request a waiver from this requirement if excessive levels of I/I are not experienced.

Comment #5: This draft permit gives us a dilution factor of 22:1 compared to that of 36.5 :1 in our previous permit, effectively lowering our TRC limit. We request a return to our previous dilution.

Response: Attachment A of this document shows how the updated 7Q10 flow was calculated for your facility's discharge. These flows are derived from measured values that were obtained during the Blackstone River Initiative (BRI) work along with USGS gage data from Woonsocket, Rhode Island and reflect drought conditions. The previous dilution factor was based on a projection of future 7Q10 values that have not been realized.

D) Comments submitted by CDM for the Town of Northbridge on 2/19/99:

Comment #1: The actual capacity of the upgraded treatment facility will be greater than the plant's rated capacity of 2.0 MGD in order to handle flow variations. Therefore, we ask that the new permit flow limit be on an average annual flow, on a moving average of the prior 12 months flow.

Response: See response to comment A.11.

Comment #2: The drainage area for the Unnamed Brook at the Northbridge outfall location on the Uxbridge USGS quad sheet should be 1.42 square miles. The town requests that the Fact Sheet be updated to reflect a revised dilution calculation resulting in a dilution factor of 1.18.

Response: We agree with this assessment. This change has been made resulting in updated limits for lead, zinc and acute copper limits, but not for TRC or chronic copper limits. See Attachment B.

Comment #3: Attachment B of the Fact Sheet appears to contain an error in the first line which states that the parameters are "cadmium, copper and zinc" and does not include the derivation of monthly average limits.

Response: This attachment should read "copper, lead and zinc". We intended to include only the daily maximum derivations in the fact sheet. All the final permit metals limits have been changed to reflect the revised dilution factor of 1.18. See revised Attachment B at the end of this document.

Comment #4: Upon acceptance of the ultraviolet disinfection system, chlorine will no longer be added to the effluent and we ask that measurement and reporting of TRC not be required..

Response: Once the UV system is installed and operating, we can then issue a minor modification to your permit to remove the TRC requirements. After installation occurs, but before the modification has occurred, you may enter the no discharge code of "C" in your DMR for TRC.

Comment #5: Northbridge requests that its permit limits for metals be based only on the dissolved fraction of the metal which occurs in the receiving water.

Response: See response to comment A.15.

Comment #6: The documentation in the Fact Sheet of the ammonia limit is insufficient. The town requests that EPA provides a revised Fact Sheet (along with additional review time) that clarifies the derivation of these limits as plant upgrades to meet these limits will be very costly. It is also unclear why the specific intervals of May 1 to October 31 and November 1 to April 30 were selected to be representative of the warm and cold season receiving water temperatures. The Fact Sheet provides insufficient justification for the reduction in the summertime ammonia from 3 mg/l to 2 mg/l. The town requests that summertime ammonia levels be based on toxicity concerns and dilution in the brook.

Response: The basis for the ammonia limits is described in the fact sheet. The "warm season" period for purposes of the ammonia criteria is climate specific and is determined on a case by case basis upon consideration of factors such as early life stages of vertebrate species and stream temperature. The warm season period was also chosen to encompass the low flow of a warm temperature period in this small tributary. The summer ammonia limits have been established to maintain instream dissolved oxygen levels in a receiving water that provides minimal dilution. These final permit limits are different than the previous permit's limits, which were based on the prior ammonia criteria. See also response to Comment A.13.

Comment #7: We request that the phosphorus discharge limits be removed from the draft permit. These stringent limits do not seem reasonable considering that the UBWPAD is not prepared to remove phosphorus at this time and will not be for the entire time period of the proposed permit. Disposal of phosphorus sludge will require additional costly sludge handling facilities to be designed and constructed. Chemical costs for alum of \$43,000 per year are expected in addition to costs for additional liquid handling of thickened sludge or other disposal.

Response: See response to Comment C.1. The issue of phosphorus will be addressed in an administrative order along with other items after the effective date of the permit.

Comment #8: The FS does not provide a basis for the inclusion of a minimum DO limit of 5.0 mg/l. The Town asserts that there is no reasonable basis for inclusion of a DO limit as there are no data to suggest that this limit will be violated. The Town requests that the DO limit be removed from the permit.

Response: Minimum dissolved oxygen limits are frequently included for discharges to effluent dominated streams to prevent dissolved oxygen sags in the vicinity of the discharge. The limit is established to ensure that levels will not drop below the instream standard.

Comment #9: We request that this permit include the same allowance that the Town may request for reduced whole effluent toxicity (WET) testing monitoring frequency after one year provided the effluent from the new facilities does not show any positive toxicity result during a one year period.

Response: This allowance has been added to the final permit stating that WETT requirements may be reduced after at least four tests are completed and reviewed.

Comment #10: The draft permit does not specify what is excessive I/I. Please explain what constitutes an excessive quantity.

Response: EPA defines excessive I/I as " the quantities of I/I which can be economically eliminated from a sewer system as determined in a cost-effectiveness analysis that compares the costs for correcting the I/I conditions to the total costs for transportation and treatment of the I/I." As a quantitative measure, according to the MA DEP's guide for the Design of Wastewater Treatment Works (Publication TR-16), a normal range of infiltration to a POTW is 250 - 500 gpd/inch diam/mile of sewer (0.24 - 0.48 cubic meters /cm of pipe diam/km/day). In designing a POTW, infiltration rates above these levels could be allowed with proper documentation. Therefore, these figures could be used as guidance. Determinations of excessive I/I should consider impacts related to groundwater and stream flow depletion and the elimination of all sanitary sewer overflows.

Note: When Northbridge's permit was drafted in December of 1998, the town was in the process of discontinuing its on site disposal of sludge generated at the plant. The Town now contracts with New England Treatment Company (NETCO) to haul its sludge away and incinerate it at its Rhode Island facility. The Town is in the process of closing or capping of its on-site disposal area and the section of the permit which spells out requirements related to on-site disposal will not apply.

E) Comments submitted by the Town of Grafton's Wastewater Treatment Plant on 2/12/99:

Comment #1: It does not appear reasonable to require the Grafton facility to remove phosphorus when the UBWPAD is not prepared to remove phosphorus at this time. The consumption of resources for the removal of the phosphorus include aluminum, sulfur and energy associated with pump operation and control systems, the extra fuel for transporting the increased sludge to the UBWPAD and the extra fuel and conditioning chemicals required at the UBWPAD for incineration of the sludge. In light of these facts, I feel that it is unreasonable from an environmental point of view to require this removal.

Response: See response to C.1.

Comment #2: The nitrogen limit's development seems to neglect the use of a dilution factor.

Response: The ammonia limits are developed from the water quality model and account for upstream concentrations of ammonia.

Comment #3: There is no basis for TSS limits for June through October. The limits should be 30 mg/l monthly average and 45 mg/l weekly average. Neither the model nor the WLA contain analyses for TSS limits.

Response: See response to Comment A.12.

Comment #4: The C-NOEC test was added to our draft permit based on a dilution factor of 19:1. This factor is in conflict with previous dilution factors.

Response: Since the permitted flow was changed to 2.4 MGD, there was a corresponding change to the dilution factor. The dilution factor calculation was derived from the WLA flows and was calculated similar to Uxbridge's 7Q10 flow as shown in Attachment A. Since the dilution available to your facility is less than 20:1, EPA Region 1 policy requires a quarterly monitoring for C-NOEC. It is important to note that the majority of the available dilution is effluent from the UBWPAD.

Comment #5: The dilution factor of 28:1 should be used to calculate the TRC limit. TRC from upstream dischargers would be zero by the time the flows reached Grafton's discharge, due to the effects of aeration, sunlight and adsorption by organic matter not previously exposed to the chlorine.

Response: As previously stated, your higher permitted flow has resulted in the dilution factor of 19:1, with a corresponding decrease in the TRC limit. The revised 7Q10 figure has also reduced the available dilution. You were granted the higher flow limit of 2.4 MGD, as you requested in your last permit application of March 1, 1994. The TRC limit is based on an assumption of zero TRC upstream.

Comment #6: Please list a numerical value for excessive I/I. I respectfully reserve the right to contest the numerical value that you consider excessive.

Response: See response to Comment D.10.

Comment #7: We request a compliance schedule for the development and implementation of the operational procedures necessary to attain the proposed (ammonia nitrogen) limits. A period of time to test for and examine how the process control system handles the possible stresses that could be encountered (in meeting this limit) is necessary.

Response: See response to C.3.

Comment #8: We request the inclusion of effluent trading guidelines in the permit. This trading should occur between facilities and between facilities and storm water discharges.

Response: See response to Comment A.16.

Comment #9: Further reviews of WLA and the Model are needed. There was only one public hearing on the Model and the WLA and no public comment meetings were scheduled. I have concerns regarding the SOD and feel that it was overestimated. I request that you supply us with documents in narrative form including all necessary schedules, figures and tables for Scenarios 7,8,9 and 9a; please include all calculations, formulae and assumptions used to determine SOD.

Response: This area was covered with the UBWPAD's comments. The model has undergone extensive review including a review by EPA's Science Advisory Board. There were two public hearings on the draft permits which included the discussion of the basis for the permit limits. All figures and tables are included in the WLA report which was provided to all permittees. The report on sediment oxygen demand rates is included as an attachment.

F) Comments submitted by the Massachusetts Department of Fisheries, Wildlife and Law Enforcement's Division of Fisheries and Wildlife on 2/16/99:

Comment #1: Generic opposition to the implementation of new ammonia criteria. By basing its new ambient water criterion for ammonia on a 20% reduction in survival, growth and/or reproduction of aquatic life, the EPA has made a radical departure from the goals of state wildlife agencies concerned about resource protection and restoration. MDFW must go on record as being strongly opposed to the application of EC20 criterion to wildlife resources managed by this Division.

Response: The previous criteria were based on chronic values for individual test species that represented reductions from the control ranging from a few percent to more than 50 percent. The updated criteria is based on chronic values standardized to a 20 percent change from the control. The 20 percent is intended to represent a small change while still being statistically significant. Other conservative assumptions utilized in developing permit limits may reduce the risk associated with the use of EC20s. For instance, the use of a critical receiving water flow with a recurrence interval of once every ten years is a conservative assumption relative to an instream criteria that is not to be exceeded more than once every three years.

Comment #2: The application of the new ammonia criteria require determination by the state of the presence or absence of sensitive life stages of aquatic organisms and if present, their numbers with respect to their populations at large. MDFW objects to the issuance of the draft ammonia discharge limits set at three times existing limits without prior MDFW consultation and approval.

Response: The permit limits for ammonia are more stringent than existing limits and not less stringent as the comment implies. The draft permit specifically requests input relative to the appropriate instream numeric criteria that should be used to establish discharge limits. Informal consultation was conducted with the Massachusetts Division of Fisheries and Wildlife before the draft permits were issued and further consultation was conducted before the final permits were issued.

Comment #3: MDFW objects to the issuance of new ammonia criteria without an analysis of affected population metrics to substantiate populations are sustainable under elevated ammonia concentrations of 10 -15 mg/l N, about 3-5 times higher than the chronic EC20 value at pH 7. None of the five draft permits involves any provisions for in-river baseline and subsequent biological monitoring of impacted populations.

Response: While there is limited fish population data, there is substantial evidence that the benthic biological community throughout the Blackstone River is currently impaired. The causes of impairment are complex and there are many possible sources. There are also many efforts ongoing to control these sources, including the issuance of these permits which reflect a reduction in current

ammonia discharge levels. The WLA is a phased effort that will require follow up monitoring once significant reductions in pollutants have been achieved. EPA will work with MADEP and MDFW to conduct follow up monitoring with a biological component, including fish population sampling.

Comment #4: The MDFW notes that for 13 out of 15 years between 1979 and 1993, temperatures exceeded 50 F during April, suitable for spawning of redbfin pickerel, chain pickerel, yellow perch and white sucker. Such species are also expected to enter the main stem in transit between tributaries during spawning. The draft permits provide no analysis on the sensitivity of early life stages of these species to the proposed high ammonia concentrations.

Response: Of the species listed, toxicity data cited in the criteria document indicates that the white sucker is the most sensitive. The white sucker has a species mean chronic value at pH=7.0 of 10.4 mg/l. The instream criteria applicable during April is 9.0 mg/l which is protective of white sucker early life stages.

Comment #5: MDFW notes for most species, that survival, hatchability and biomass drops off too sharply not to warrant a daily maximum discharge limit. MDFW is therefore opposed to the issuance of these permits which require no maximum daily or average weekly discharge limits for ammonia.

Response: The commenter is correct and in accordance with the criteria document, weekly average permit limits equal to twice the monthly average limit have been included in the final permits. This is recommended in the revised ammonia criteria. The exception to this was that where monthly average limits of 15 mg/l were established, weekly average limits of 30 mg/l were not established since it would not be expected that these levels would be approached in the effluent.

Comment #6: The MDFW anticipates the new draft ammonia discharge limits set at 10 -15 mg/l N will result in ammonia concentrations in excess of EC20 values along the entire Blackstone River for extended time periods during periods of low flow to the detriment of aquatic resources.

Response: The water quality modeling conducted indicates that with dilution and instream nitrification, the ammonia limits will not exceed the applicable seasonal ambient criteria except in small localized mixing zones.

Comment #7: The MDFW goes on record with EPA in opposition to the implementation of these permits which violate important premises of the 1998 EPA guidance document. MDFW further questions the authority of DEP to make decisions that may adversely impact wildlife resources without approval from our agency.

Response: It is EPA's position that, after further consultation with MDFW and MADEP, and associated changes to the draft permits, that these permits do not violate premises of the 1998 ammonia criteria document. EPA issues permits in close coordination with MADEP which is responsible for providing a water quality certification for each permit. While EPA will not comment on Massachusetts interagency coordination issues, EPA does value, and will continue to seek, MDFW's advice on fishery issues.

G) Comments submitted by the Massachusetts Department of Fisheries, Wildlife and Law Enforcement's Riverways Programs on 2/17/99:

Comment #1: At the present time, effluent from the UBWPAD's WWTP is discharged into a concrete-lined channel. Other than some chlorine removal, I doubt that significant biological or other pollution attenuating activity occurs within this channel. If this flow were instead directed into a constructed wetland, it is highly likely that the same if not better chlorine removal results would be obtained, along with a beneficial reduction in many other desirable effluent constituents.

Response: Although this proposal does have merit and could further reduce pollutant levels in the effluent, the EPA and the DEP cannot mandate specific effluent treatment, but have the authority to set effluent limits which the permittee then has to decide how to comply with.

Comment #2: I would like to encourage the town of Millbury, which will be shutting down its POTW in the foreseeable future, to naturalize and beautify the site by removing the buildings and other concrete on the site and replanting the area with suitable vegetation.

Response: This decision is up to the Town and we would encourage you to work with the Town and other interested local partners to try to agree on a desirable use for this parcel of land once it is decommissioned.

Comment #3: I would like to second a suggestion Mike Toomey made at the public hearing on 2/10 that the main stem of the Blackstone River be tested for elevated levels of estrogen, which, if present, may be disrupting the endocrine systems of fish and other aquatic organisms, resulting in substantial impairment of their reproductive and other biological functions.

Response: This type of monitoring is still in the research arena. We would encourage you to work through local and volunteer groups to undertake these types of studies. The Massachusetts EOE Blackstone Team is quite active and has created an effective partnership of local constituencies which could offer support or assistance for such efforts.

Comment #4: We are concerned that there are no daily max limits for BOD, CBOD and TSS which is standard. Why monitor these parameters only 3 times per week, isn't daily more typical?

Response: The WLA established average monthly limits only and the permitting regulations do not require maximum daily limits. However, maximum daily limits can be an important component of a water quality based permit, in particular for combined sewer facilities that experience extremely high flows at times. Accordingly, maximum daily limits consistent with the previous permit have been included in the UPWPAD permit.

Comment #5: The DO of 5.0 mg/l is too low given this is the state standard. Should be asking better from the facility.

Response: The effluent dissolved oxygen limit is a minimum limit. The limit is designed to prevent dissolved oxygen sags below the state standard in the immediate vicinity of the discharge due to mixing with a low dissolved oxygen effluent.

Comment #6: Why is the permitted flow for Uxbridge 2.5 MGD when it is a 2.48 MGD plant.

Response: The previous permit includes a 2.5 MGD monthly average flow limit which will remain in the final permit. This is essentially the same as the facility listed design flow of 2.48 MGD.

Comment #7: April is a sensitive time in the life cycle of many aquatic organisms. How low a DO is predicted? Is the low DO predicted for the effluent or for the river itself, because of the waste stream discharge?

Response: The WLA utilized a single receiving water flow (152 cfs) for the period of November through May. While the WLA concluded that slightly more stringent ammonia limits would be necessary in April in order to maintain river dissolved oxygen levels above 5.0 mg/l, receiving water flows in April are much higher than at other times. Consequently, we are not anticipating dissolved oxygen violations during April.

Comment #8: For UBWPAD, what percentage of flow is industrial? What is population served by the plant? Has the septage acceptance ever resulted in problems with any parameters? Is septage accepted from out of the watershed/service area?

Response: According to Thomas Walsh of the UBWPAD, the current population served by the plant is about 210,000. With the planned addition of those currently served by the Millbury POTW, that number would approach 220,000. The UBWPAD accepts septage from communities which are not among its member communities. We cannot determine whether the acceptance of

septage in and of itself has caused any permit violations. Our records indicate that about 5% of the flow to the UBWPAD is from significant industrial users.

Comment #9: The flow dilution of 1.1:1 makes it seem like there is 1.1 gallons of effluent for every 1 gallon of river water and not 56 MGD effluent for the 4.4 MGD river water at 7Q10.

Response: The commenter appears to be correct. The dilution ratio should be 0.1:1 with a dilution factor of 1.1. Accordingly, the calculated limits only allow for values of 10% above the criteria levels were there to be no dilution.

Comment #10: Nitrogen loading is problematic in Narragansett Bay and a TMDL is being done. Will the permit for the UBWPAD be revised when the TMDL is determined? Is there a time line for the completion of the TMDL analysis?

Response: This TMDL is being conducted by the RI DEM. Depending on the findings of this TMDL, these permits may be modified to reflect its findings. In the interim, monthly nitrate and nitrite monitoring has been added to the all of the permits except for the UPWPAD, which had already included such a monitoring requirement.

Comment #11: We feel that the C-NOEC limit should be a minimum of 93%, since at 7Q10 flows the effluent is greater than 93% of the river, not 90. Also, on Table 1, the NOEC failures are not listed as violations.

Response: This limit will remain at 90%, as calculated in the fact sheet attachment. When the last permit for the UBWPAD was issued, the permittee appealed its NOEC limit. This effectively stayed this limit and it remained a monitor only requirement from that point on.

Comment #12: Why is this facility (UBWPAD) under an enforcement order?

Response: UBWPAD's enforcement order addressed the metals cadmium, copper, and zinc and chronic toxicity exhibited by the effluent.

Comment #13: Given the nitrogen sensitivity of the ultimate receiving water, Narragansett Bay and the possibility the nitrogen loading investigations will identify the need to lower the dry weather loading of nitrogen, should the ammonia limit be 3 mg/l all year long? At the very least, the lower "summer" limit should begin much earlier than May.

Response: The ammonia limits have minimal effect on total nitrogen levels reaching Narragansett Bay. Ammonia limits are achieved at WWTPs through a nitrification process that converts ammonia to nitrate and nitrite which are still bioavailable forms of nitrogen.

Comment #14: Considering how few users there are for this facility (Northbridge) the flow is high. What is the industrial contribution in gpd? Why is the number of customers not known?

Response: The permit application asks for a range of users. As of April of 1997, the Town provided a customer (user) range of 5,000 to 10,000. More recently, the Town has stated that it has a sewer population of just over 11,000. If Northbridge's residents consume large amounts of water contributing to capacity problems at the plant, we would encourage the facility to educate its users about water conservation measures and how the increased flows eventually may lead to higher plant costs which could translate to higher user rates. Some of this flow is attributable to infiltration and inflow (I/I) and we believe the permittee is currently addressing and will continue to work on measures to reduce these flows to the plant. Annual I/I reporting is required in this final permit.

Comment #15: If Northbridge is a 1.8 MGD plant, why is the flow limit set at 2.0 MGD? Is this an increase over the existing permit? If so, why increase flows to a plant which is experiencing problems, has violations of flow and other parameters and is under an enforcement order?

Response: The Northbridge WWTP will be undergoing a major upgrade that will result in a significant reduction in the total pollutant load. The 2.0 MGD limit reflects future capacity needs.

Comment #16: If Millbury is a 1.2 MGD plant, how can the flow be increased to 2.7 MGD? Why was this increase requested and is it justified? The facility has had numerous violations of many parameters so how can increasing the flow possibly be consistent with water quality standards and antidegradation?

Response: The value of 2.7 MGD represents that which was used in the WLA and which the Town had previously expected to expand to over a 20 year period. However, since that time, the Town has voted to and begun to take actions to tie in all of its flows to the UBWPAD. Therefore, the final permit flow limit has been changed back to 1.2 MGD, to reflect the current flows to the plant. Accordingly, the TRC limits, which are based on the dilution factor of 53, have been changed to 0.58 mg/l and 1.0 mg/l for the chronic and acute values, respectively.

H) Comments submitted by the Rhode Island Department of Environmental Management on 2/19/99:

Comment #1: The draft permits do not contain any daily maximum limits for CBOD, BOD, TSS or ammonia. RIDEM suggests that EPA/DEP calculate daily maximum limits for these and all other parameters.

Response: Weekly average limits for ammonia toxicity have been included for all permits as discussed in response to Comment F5. Maximum daily limits are not required and have not been developed in the WLA. However, maximum daily limits are important in low dilution situations and for treatment facilities that experience high wet weather flows. Accordingly, the maximum daily limits from the previous UBWPAD permit have been retained in the reissued permit.

Comment #2: The WET testing requirement to test for influent and effluent metals, cyanide and arsenic would be better tracked, via PCS, if it were required in Part IA of the permit. We understand that this data is not currently entered into PCS and is therefore not readily available to permit writers for use in reasonable potential analysis.

Response: The WET testing protocols require effluent sampling for several parameters, including metals, but does not require sampling of the influent or sampling for cyanide or arsenic. At this time, there are no plans to include this data in the Permit Compliance System. However, WET test results are incorporated into a MADEP data base along with the effluent monitoring data. The WET testing results are available for review by anyone at any time.

In addition, the permits for Millbury, Grafton and Uxbridge require that these municipalities minimize the discharge of metals in their effluent by looking at items such as industrial user input, corrosion control measures and treatment plant modifications. These issues are to be addressed in the BMP/PP plans which are required in the permits. The UBWPAD and the Town of Northbridge have already undergone these types of efforts to address metals discharges from their plants.

Comment #3: Woonsocket's draft (and previous) RIPDES permit contains limits for several metals that are not in any of these draft permits. The fact sheets do not contain any documentation to verify that there is no reasonable potential to exceed standards for these parameters (e.g hexavalent chromium, lead, silver and cyanide). RIDEM would like to see a comparison of all available effluent data to allowable discharge levels to verify that these permittees have no reasonable potential to exceed any pollutants that are not included in their permits.

Response: The WET test chemical analyses do include results for several metals. The UBWPAD is required in its pretreatment program to do an annual influent and effluent analysis for several metals and cyanide. Based on available dilution at these plants, only metals limits were warranted for the UBWPAD and the Northbridge plants. The EPA and DEP typically set metals limits for those parameters when it is believed that their effluent levels could cause or contribute to water quality standards violations. Based on review of UB pretreatment reports, it appears that cyanide in the effluent may have the potential to violate water quality standards. Instream criteria for free cyanide are 5 ug/l and 22 ug/l for chronic and acute values, respectively. Therefore, the final permit has added a monthly monitoring requirement for free cyanide.

Comment #4: Monitoring requirements for winter levels of phosphorus were not included in the draft permits. We suggest that year-round monitoring of phosphorus be added to the permits at a once per month frequency.

Response: EPA agrees with this comment. Winter phosphorus loadings may become an issue if there is an indication that these loadings are being retained in impoundments and are available to contribute to algal growth in the summer period. Winter monitoring requirements for phosphorus have been included in the final permits.

I) Comments submitted by Save the Bay on 2/19/99:

For UBWPAD:

Comment #1: The final permit should contain an enforceable schedule for the facility to reduce its I/I problems. Between 1996 and 1997 flow exceeded 80% of the design flow in seven out of the 24 months and exceeded its permit limit 2 times. (Similar comment made for Uxbridge, Grafton, Northbridge and Millbury)

Response: Only if the permittee discharged its effluent for 90 consecutive dates at greater than 80% of its design flow would it have to take action. If this would happen, Page 3 of the permit specifies that the permittee would have to submit a report to EPA and DEP to show how the treatment plant would maintain satisfactory treatment levels at these increased flows. However, there is an annual reporting requirement to describe I/I minimization efforts by the permittee. The UBWPAD and Northbridge plants are undergoing facilities planning which will include a major effort to reduce infiltration and inflow to their collection systems. The UBWPAD receives flows from combined sewerage areas in Worcester and that both Worcester and UBWPAD facilities planning will address management issues related to wet weather flows to the treatment plant. The EPA and MA DEP will take appropriate actions during the permit terms if necessary, depending on what is reported annually by the permittees regarding infiltration and inflow.

Comment #2: The draft permit lacks daily maximum limits and represents a less stringent permit. The draft permit's upper pH limit of 8.3 is also less stringent than the existing permit. These limits should remain in order to be consistent with anti-backsliding provisions of the CWA. (Similar comment made for Uxbridge, Grafton, Northbridge and Millbury)

Response: See Response to H.1. The upper pH limit of 8.3 reflects the change in Massachusetts water quality standards from the previous limit of 8.0.

Comment #3: There are no mass loading limits in the draft as required by 40 CFR 122.45(f). (Similar comment made for Uxbridge, Grafton, Northbridge and Millbury)

Response: The final permits include mass limits for BOD, CBOD and TSS which are based on the permitted flow and concentration limits.

Comment #4: The calculations for metals and TRC should use the 1Q10 stream flow not the 7Q10. This will give a more appropriate limit based on a worst case dilution scenario of toxics exposed to aquatic organisms. (Similar comment made for Uxbridge, Grafton, Northbridge and Millbury)

Response: The Massachusetts Water Quality Standards (WQS) incorporate the use of the 7Q10 receiving water flow for determining compliance with ambient criteria. Although national guidance recommends the use of 7Q10 for establishing chronic toxicity based limits and the use of 1Q10 to establish acute toxicity based limits, in Massachusetts both limits are based on the 7Q10 flow until such time as the State WQS are revised to reflect national guidance.

Comment #5: Continuous measurement of TRC should be required instead of one measurement per day as proposed in the draft. If the effluent were to develop toxic levels of chlorine and discharged for almost a full day between sampling events it could be devastating to aquatic organisms that are exposed. (Similar comment made for Uxbridge, Grafton, Northbridge and Millbury)

Response: Generally, the EPA and DEP do not require continuous TRC monitoring, although some facilities may have this capability. If so, such facilities would have to report the highest of all sample results in a particular month, since the maximum daily limit is an instantaneous limit. Each of the final permits has added a requirement that the permittees submit to EPA and DEP a report which will address how flow variability and chlorine demand variability affect compliance with the TRC and fecal coliform limits at all times. The goal is for the POTWs to take appropriate measures and have procedures in place to comply with these limits at all times.

Comment #6: We recommend that the scope of pollutants which are limited/monitored in the final permit be expanded to include at least limits for silver, lead, mercury, cyanide, nickel and chloroethylene compounds. These limits are justified due to occasional failures of past toxicity testing. (Similar comment made for Grafton, Northbridge and Millbury)

Response: See response to H.3.

Comment #7: We recommend at least one time per year an effluent analysis for priority pollutants listed in 40 CFR 122, Appendix D, tables II and III be performed. (Similar comment made for Uxbridge, Grafton, Northbridge)

Response: It is our experience that these scans do not reveal anything unusual or unexpected for municipal discharges. Therefore, we will rely on the extensive permit sampling and WET test analytical results as measures of whether there are elevated levels of metals or other parameters that could cause or contribute to water quality violations.

Comment #8: The permit should require the plant to be certified as Year 2000 compliant by June of 1999. This will alert the operator of EPA's commitment to ensure uninterrupted treatment operations beyond 12/31/99 and allow time to rectify known or unanticipated problems. (Similar comment made for Uxbridge, Grafton, Northbridge and Millbury)

Response: Neither the EPA nor the DEP can require or have any certification procedures in place for Y2K compliance for permittees. Although we appreciate your mention of this, we can only encourage the facilities to do what they can to plan for and anticipate any disruptions that may be caused by the turn of the calendar.

For Uxbridge:

Comment #9: The term excessive I/I needs to be defined. An enforceable schedule should be incorporated into the permit to ensure that steps are taken to reduce I/I problems, if in fact they exist. (Similar comment made for Grafton)

Response: See response to comment D.10.

Comment #10: The facility failed one WET test in 1996. Therefore, we recommend that WET testing be increased to 4 times per year using two species to give a clearer picture of the effluent's toxicity on a seasonal basis.