

**RESPONSE TO PUBLIC COMMENTS ON
DRAFT NPDES PERMIT NO. MA 0102148 FOR THE
BELCHERTOWN WATER RECLAMATION FACILITY(WRF) LOCATED AT 175
GEORGE HANNUM ROAD, MASSACHUSETTS, 01007**

On October 1, 2003, the U.S. Environmental Protection Agency (“EPA”) and the Massachusetts Department of Environmental Protection (“MADEP”) (together, the “Agencies”) released for Public Notice and comment a draft National Pollutant Discharge Elimination System (“NPDES”) permit to the Town of Belchertown Department of Public Works (“Belchertown” or “Permittee”) authorizing discharges from the Belchertown Water Reclamation Facility (“WRF”) to the Lampson Brook and Connecticut River. The public comment period for this draft permit expired October 30, 2003. This is a response to comments received during the comment period from Tighe & Bond, a consulting firm working on behalf of Belchertown, and from the Massachusetts Riverways Program (“Riverways”).

Belchertown Comments

Comment #1: Part I.A.1 - Page 2 of 10 - Mass Loading Limits (BOD₅ and TSS)

Mass loading limits for monthly and weekly biochemical oxygen demand (BOD₅) and total suspended solids (TSS) were not included in earlier permits. These limits were derived by multiplying the monthly and weekly concentration limits by the annual average flow rate (1.0 MGD) and a conversion factor of 8.34 to arrive at a mass loading value.

We take exception to this approach since it uses an annual average flow to compute weekly mass limits. Since average weekly flow can be significantly greater than average annual flows, any mass limit should be based on flows that correspond with the loading frequency in question, i.e., maximum monthly flow and maximum weekly flow. Additionally, the monitoring requirements in the new permit require sampling once per week. This effectively results in the weekly average condition being the equivalent of a daily maximum limit. The approved basis of design for this facility included a maximum daily peaking factor of 2.5 times annual average flow. [Proposed maximum weekly flow conditions, with mass based BOD₅ limits of 63 lbs/day would result in a required effluent concentration of 3.0 mg/L. An effluent BOD₅ limit of 3.0 mg/L cannot be reliably achieved and was not included in the approved facilities plan and final design.]

While the Town continues to disagree with the basis for the proposed mass based limits for BOD and TSS, the proposed limits would be acceptable to the Town if clarifications are made to the permit to indicate that the calculations of discharge BOD and TSS mass for compliance monitoring purposes are to be made using the same methods used by EPA to derive the permit limits (i.e. permit compliance calculations should be made using the annual average flow rate as required to be reported in monthly monitoring reports and corresponding weekly or monthly

average concentrations). This approach will allow direct comparison of the discharge monitoring data with the permit limitations using the same basis for establishing calculated mass values. This method would be more consistent with the basis for the proposed limits.

Response #1:

MADEP adopted a policy establishing flow limits in POTW permits as an annual average in order to account for seasonal flow variations, particularly those associated with high flow and high groundwater which commonly occur in the spring time. See June 12, 2000, MADEP-DWM NPDES Permit Program Policies Related to Flow and Nutrients in NPDES Permits ("Flow Policy"). The calculation of the Belchertown flow is based on annual average flow rather than the monthly average flow calculation employed in the prior permit. Consistent with the Flow Policy, the Agencies have imposed weekly and monthly mass limits in order to maintain approximate overall pollutant loadings of BOD and TSS in the receiving water.

Mass limits are reasonable in light of the continuing severe impairment of the receiving waters—Lampson Brook, Weston Brook and Forge Pond—caused by Belchertown WRF effluent discharges and other inputs. Each of the receiving waters is each listed on the Massachusetts Year 2002 List of Impaired Waters under Category 5 as water quality limited segments requiring the calculation of a total maximum daily load of pollutants in order to implement water quality standards. Lampson Brook and Weston Brook are impaired by unionized ammonia, chlorine, excessive nutrients and organic enrichment/low DO, while Forge Pond is impaired by nutrients and noxious aquatic plants. As the Agencies explained in the Fact Sheet, the use of the annual average flow to calculate weekly and monthly mass loading limits will tend to offset any increase in loading that might otherwise occur as a result of the new definition of the flow limit. On the other hand, the use of average weekly or monthly flows to calculate mass limits would compound the potential for greater pollutant loadings, because (as Permittee acknowledges) the magnitude of such flows in any given month or week can be significantly higher than average annual flow value. The Permittee's compromise proposal of using of the annual average flow as reported monthly to calculate limits would likewise result in a potential for a net increase in pollutant loadings. The Permittee has failed to demonstrate that its proposed calculation would not cause or contribute to further impairment of the receiving waters. Nor has it demonstrated that its revision would ensure compliance with the anti-degradation provisions of the Massachusetts Surface Water Quality Standards (314 CMR § 4.04) ("Massachusetts WQS") to the extent that it may result in a lowering of water quality. Accordingly, the Agencies have retained the use of the annual average flow to calculate mass limits.

An effluent BOD limit of 3.0 mg/l would only be necessary if the facility discharged at the maximum daily design flow for an entire week in the June - October time period which is an unlikely scenario.

The Agencies consider the frequency of monitoring for BOD₅ and TSS to be appropriate given

the ongoing impairment of the receiving water, specifically the cultural eutrophication of Weston Brook and Forge Pond and the attendant water quality impacts on dissolved oxygen, solids and color and turbidity. The sampling frequency in the Final Permit allows the Agencies to determine whether the permittee's treatment facility is meeting the permit requirements and to determine whether expected water quality improvements are being achieved and maintained. The Agencies disagree with the Permittee's contention that the weekly sampling condition in effect imposes daily maximum mass limits on BOD₅ and TSS. The monitoring frequency of once per week is a minimum monitoring frequency. The Permittee may monitor more frequently provided the monitoring frequency is consistent from week to week. The Permittee may continue to utilize the daily peaking factor so long as the weekly averages for the pollutants do not exceed the permit limits. In any event, the Permittee should note that the Agencies are not bound by the approved facility plan and design of the WRF in setting permit conditions and limitations. Rather, the Agencies are obligated to include in the Final Permit reasonable limitations and conditions with respect to pollutants that are necessary to ensure compliance with Massachusetts WQS. See 33 USC § 301(b)(1)(C); 40 CFR § 122.44(d)(1)(i). Permits must include limits as stringent as necessary to meet Massachusetts WQS irrespective of cost considerations or technological feasibility. In certain instances, permits limits or conditions may necessitate operational or technological improvements beyond an approved facility plan and design.

Comment #2: Part I.A.1 - Page 3 of 10 - Phosphorus Limit, Mass Based Limit Calculation

As with BOD and TSS, the monthly average mass based limit for phosphorus has been calculated by EPA using the annual average flow permit limit. Citing the same concerns as noted above, permit compliance calculations should be made on the same basis as used for establishing the permit limit.

Response #2.

Mass based limits for phosphorus have been added to the permit in order to maintain loadings to the receiving water and to ensure compliance with Massachusetts WQS. Please see Response #1 above. Given that a major cause of impairment of the receiving water is phosphorus-driven cultural eutrophication, the Agencies believe that it is appropriate to minimize the risk of increased phosphorus loading by opting for a limit based on the annual average flow rather than the less conservative alternatives set forth by the Permittee.

Comment #3: Part I.A.1 - Page 3 of 10 - Whole Effluent Toxicity Requirements

The draft permit contains the same requirements for toxicity testing as contained in the current permit issued in 1999 and also as proposed in the September 2000 draft permit. These include requirements for both acute and chronic toxicity testing four times per year. A review of the last two years of toxicity test results indicates that treated effluent is generally not toxic as measured by both acute and chronic toxicity tests. Based on the review of the toxicity test data, on behalf

of the Town of Belchertown, we request that the permit limitations and the monitoring requirements for acute toxicity be eliminated from the permit.

Response #3:

A review of whole effluent toxicity test results from 2003 and 2004 indicates that while permit limits were met, the discharge is not free from chronic toxic effects. On two occasions the chronic permit limit was just met and on several other occasions when the chronic limit was met, there was some indication of chronic toxicity at dilutions less than the permit limit but a clear endpoint was obscured by significant variability amongst replicates. Given the lack of any significant dilution in the receiving water and the potential for POTWs to cause instream toxicity, the requirements for toxicity testing are retained in the Final Permit in accordance with the EPA Policy for Development of Water Quality-Based Permit Limitations for Toxic Pollutants, 40 FR 9016 (March 9, 1984), and the MADEP Toxics Control Policy. These policies require acute toxicity limits of LC50 = 100% and chronic toxicity limits of NOEC = instream waste concentration (1/dilution factor).

Comment #4: Part I.A.1 - Page 3 of 10 - Copper Limit

The copper limit proposed is extremely stringent and may be technically unachievable. In addition, there are numerous technical reasons why the need for copper limits remains in question including, the reduction of copper toxicity due to copper availability associated with complex formation with other materials, the limitations of commercial laboratory testing and the methods used for development of the Gold Book standards. For a number of years EPA has been working with Water Environment Federation (WEF) to develop a biotic ligand model for copper toxicity to account for the influences of wastewater characteristics with the reduction in copper toxicity. However, to date, EPA has not used the results of this research to address the problems numerous communities are facing in regard to extremely stringent copper limitations. For this reason, the Town of Belchertown requested that copper limits not be included in the previous draft permit until these issues were resolved.

While it appears unlikely that EPA will soon modify the criteria values for copper based on the biotic ligand model, the calculation of the copper limit as currently presented by EPA in the Fact Sheet is a function of hardness. EPA has used a hardness value of 60 mg/l for calculating copper limits. The Fact Sheet does not provide a statement of basis for this value and we believe that it is inappropriately low. During 2002 and 2003 the average outfall hardness was 94.5 mg/l and the average instream hardness above the outfall was 72.9 mg/l. Based on the 7Q10 dilution ratio of 1.065, the calculated hardness downstream of the of the outfall is 93.2 mg/l.

Because hardness so strongly effects the theoretical toxicity values used for establishing copper limitations, and because hardness is a parameter the POTW can control, we believe that POTWs should be allowed to control hardness through chemical addition in order to allow a higher

discharge limit. Given the large potential additional cost to provide treatment to remove copper

through other forms of chemical addition, such as poly aluminum chloride to achieve the low limits included in the draft permit, it would be preferable to develop more flexible alternative permit limits that are expressed in the permit as a function of hardness, using the same equations used by EPA to develop the proposed limits. While the limitation could be expressed in the permit directly in the form of the equations used by EPA to develop the proposed limitations, for compliance monitoring and for operational evaluation, it may be simpler to express the limits in tabular form based directly upon EPA's equation as presented in the attached table 1.

The addition of hardness to the treatment process is expected to provide an incremental improvement in copper removal efficiency. While this alone is not expected to be sufficient to bring the facility into compliance with the limits currently contained in the draft permit, combined with the proposed mechanism for hardness based permit limits, addition of hardness may be sufficient to achieve permit compliance without the addition of further amounts of chemicals such as poly aluminum chloride which are known to cause problems with sludge processing and may also interfere with achieving the very low solids limits imposed on the Belchertown POTW. Use of poly aluminum chloride for copper control may also have an undesirable side effect of increasing aluminum concentrations on the final treated effluent.

The permittee recognizes that the inclusion of hardness based limitations for copper expressed directly in the permit may be a new concept. We are unaware of other similar discharge limits. However, we are aware that in other permits, specific limitations for pollutant parameters have been expressed as a function of other discharge parameters, such as if the flow is above a given value, a pollutant discharge limitation may be one value and if the flow is below the given value, the pollutant limitation is another value. Therefore, there is precedent for establishing permit limits to be complied with under different discharge conditions. All of the modifications to the permit proposed in this letter are consistent with the specific methods used by EPA to determine the limits included in the draft permit. There are no adjustments or modifications to State Water Quality Standards used for development of the proposed revised limitations.

The expression of the limitations for copper is consistent with EPA's requirement to express limitations for toxic metals in terms of concentration limits.

While the development and inclusion of permit limitations are expressed as a function of hardness may present minor additional level of effort for both the POTW and EPA to monitor and verify permit compliance, the potential benefits to the Town, including financial benefits, significantly outweigh this potential drawback."

Response #4:

The copper limit is based on national criteria recommendations promulgated by EPA under Section 304(a) of the Clean Water Act and adopted by Massachusetts as a part of its water quality

standards. See EPA National Recommended Water Quality Criteria (2002) and 314 C.M.R. §

4.05(5)(e). Massachusetts WQS require that EPA criteria established pursuant to Section 304(a) be used for toxic constituents, including copper, unless site specific criteria have been established. The Agencies do not believe that it is advisable to defer permitting decisions based on the potential that a revised copper criterion value will be developed in the future. This is particularly true in the case of toxic pollutants, which can adversely impact aquatic life in the short-term. Accordingly, the copper limit will remain in the Final Permit.

The Agencies concur with the analysis of downstream hardness values, and have changed the permit accordingly. Based on the revised hardness value, the new copper limit is 9.4 ug/l monthly average and 14.0 ug/l maximum daily. Monthly average copper values, as documented in Attachment C of the fact sheet, range from 5.0 ug/l - 29.1 ug/l. These values represent a reasonable potential for the Belchertown WRF discharge to cause or contribute to an exceedance of the copper criteria. Under 40 CFR § 122.44(d) of the NPDES regulations, EPA is obligated to include the limit regardless of whether the treatment facility is capable of achieving it. At any time, the Permittee may pursue development of a site specific criterion, and upon approval by DEP and EPA, the permit can be modified to reflect the site specific criterion.

The Agencies do not concur with the proposal to establish a copper limit that varies with hardness. A variable copper limit would be administratively impractical from a compliance monitoring standpoint and is significantly more complex than the example provided by the Permittee. Given the Agencies' resource limitations and the extensive backlog in the NPDES permitting program, this additional level of complexity is not justified. In addition, the Agencies do not believe that it is practical from a facility operations standpoint to ensure compliance with a variable limit. Most POTW facilities achieve copper limits through a combination of source reduction efforts and operational changes at the treatment facility. It is not practical to implement a source reduction program or operational procedures to meet a limit that could regularly change. Furthermore, the Agencies do not consider it to be appropriate to artificially increase the effluent hardness to levels well above the natural instream hardness in order to discharge higher levels of copper with little understanding of the fate and transport of this copper. For instance, copper discharged by the facility may accumulate in the sediments of Forge Pond downstream of the facility. Altering the natural chemistry of the receiving water is not consistent with the goals of the Clean Water Act to maintain the chemical, physical, and biological integrity of ambient waters.

Alternatives for achieving copper limits, including potential indirect impacts of alternatives such as the chemical addition of poly aluminum chloride, may be addressed through an administrative compliance order if the Permittee is unable to meet the permit limit. A "monitor only" requirement for aluminum has been added to the permit in order collect data on the potential for excessive amounts of aluminum in the treated discharge.

Riverways Comments

Comment #1:

The draft permit includes load limits for both BOD₅ and TSS based on allowable seasonal concentrations and the average monthly flow limit of the facility. This is a valuable addition to the permit requirements given the impaired status of the receiving waters affected by this discharge. The reasoning and methodology used is consistent with other permits and with the need to reduce impacts associated with the discharge. While the Riverways staff continues to have issues with the change in the method used to determine monthly average flows, the addition of the mass limitations helps offset some of the problems with the annual averaging and increases in discharge volume. One question arises about the flow limit in the existing NPDES permit for the Belchertown facility. Is the flow in this draft permit greater than the flow in the current permit? If existing permitted average monthly flow is less than 1.0 MGD, then the load limitations for BOD₅ and TSS should be based on the lower flow rate so the allowable load will remain the same despite an allowed increase in flow. This would be in keeping with anti-degradation objectives.

Response #1:

We concur with the importance of the mass loading limits. The average monthly flow limit in the previous permit was 1.0 MGD

Comment #2:

There is a further concern with the mass limitations being based on 1.0 MGD given the status of the receiving waters. The existing TSS and BOD₅ loads, as extrapolated from the DMR information provided with the Fact Sheet, are significantly lower than what the new permit would theoretically allow. This is a concern because the receiving waters are currently impaired by organic enrichment/low D.O. under existing loadings. If the waters are unable to meet state water quality standards presently; it seems likely an increase in BOD₅ and TSS would further exacerbate impairment due to organic enrichment/low DO. The need to have a TMDL completed before determining the allocation for the different inputs to the system is understandable. It is our hope that the TMDL can be completed in a timely fashion and adjustments made to the NPDES permit and the allowable daily load of TSS and BOD₅ if warranted by the TMDL allocations.

Response #2:

Concerns with organic enrichment/low D.O. are primarily related to the excessive phosphorus discharged by the facility. We do not anticipate any significant impact from BOD₅ and TSS if the limits contained in the Final Permit are met. The phosphorus limits contained in the Final Permit are expected to achieve significant improvements in the receiving water quality. If a future assessment or a TMDL indicates that water quality uses and criteria have not been achieved, then future permit actions may require lower limits.

Comment #3:

Ammonia limits vary with the seasons with a transition from cold weather limits to warmer temperature limits occurring in May. The sampling frequency for ammonia is once per month but no guidance is given on when during the month the sampling should take place. Given there will be only one sample in the month of May, and May has its own unique ammonia limit, a request for a sampling mid-month would help the plant operators make sure the transition from the higher winter limits was effective.

Response #3:

While we agree with the concern, the data from this facility indicates that ammonia levels are consistently much lower than the permit limits for November - May. This is also less of a concern given the relatively small transition from the April permit limit of 10.0 mg/l to the May permit limit of 7.0 mg/l.

Comment #4:

The testing methodology for copper appears to be the same as other NPDES permits issued in Massachusetts. We agree with EPA's rationale for using this methodology. We also agree with the phosphorus limits placed on the discharge. The receiving waters are currently listed as impaired with nutrients as a causative factor. The EPA used a defensible and accepted method to arrive at the phosphorous limit for the facility. The intent of the limit is to protect the receiving waters and the 1.0 MGD flow number is simply a convenient figure to use based on a known phosphorus end point. It is our hope more current data than 1986 can be used in determining phosphorus loads in the future so changes in the non point source loads and the total maximum daily load can be factored into the calculation.

Response #4: We concur with the need to have more current non point source loading data and ambient water quality data for future permitting decisions. If a future water quality assessment/analysis and/or a TMDL indicate that water quality criteria are not being met, more stringent permit limits may be necessary.

Comment #5:

The Fact Sheet appendix lists the 7Q10 for the Lampson Brook as 0.1 cfs. Was this derived from flow data taken from Lampson Brook near the discharge or extrapolated from gage data from a near by river or a gage in another reach of the brook?

Response #5:

There are no gages in Lampson Brook. The 7Q10 flow was estimated from the drainage area upstream of the discharge and gage data determined to be representative of Lampson Brook.

Comment #6:

It is commendable that the facility upgraded to the use of UV to disinfect its discharge. Chlorine can prove both acutely and chronically toxic to aquatic systems. Was the chlorine delivery system kept in place at the facility as a contingency should the UV disinfection system experience a failure?

Response #6:

The permit does not authorize the use/discharge of chlorine.