

Mary S. Booth, PhD

April 29, 2008

Ian A. Bowles, Secretary EOEEA  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Suite 900  
Boston 02114

Laurie Burt, Commissioner MassDEP  
Massachusetts Department of Environmental Protection  
One Winter Street, 2nd Floor  
Boston, MA 02108

Michael Gorski, Regional Director DEP WERO  
Western Regional Office, Massachusetts Department of Environmental Protection  
436 Dwight Street  
Springfield, MA 01103

Re: **EOEA # 13635, Russell Biomass Power Plant, Russell  
DEP WMA File # 9P2-1-04-256.04**

Dear Secretary Bowles, Commissioner Burt, and Regional Director Gorski:

While efforts by the EOEEA to promote alternative energy sources in Massachusetts are to be greatly commended, such projects have impacts that must be carefully examined. Permitting based on the best available science will ensure that projects intended to ameliorate climate impacts by energy generation do not actually worsen environmental conditions in other ways.

The purpose of this letter is to comment on the Environmental Impact Report and follow-on documents for the Russell Biomass Plant. The EIR and Water Management Act permit application for the Russell plant appear to contain significant errors or misrepresentations in the analysis of streamflow characteristics and the water quality criterion for phosphorus. In brief,

- The applicant inappropriately uses the USGS program StreamStats to generate river discharge estimates for the Westfield River at the proposed project location,

resulting in inaccurate determination of the 7Q10 value that is central to estimating the proportion of flow taken by the plant, dilution of pollutants in plant effluent, and temperature effects. StreamStats is intended for use in watersheds up to 149 m<sup>2</sup>, but the Westfield watershed at the project location is 331 m<sup>2</sup>. Much evidence exists to suggest that the true 7Q10 of the Westfield River is significantly lower than the applicant's estimate, meaning that a re-evaluation of plant impacts affected by river discharge should occur.

- The applicant, and the review process to this point, have not acknowledged that climate change effects may significantly affect river discharge in the future, meaning that water takings by the Russell plant will have an increasingly negative effect on the viability of the Westfield River. This letter provides evidence that the frequency and severity of low-flow events have in fact increased on the Westfield River in the last 20 years.
- The applicant overstates the EPA water quality advisory criterion for phosphorus by a factor of ten, leading to incorrect evaluation of the impact of plant phosphorus discharges.

These errors or misrepresentations are of a serious material nature, and significantly affect the adequacy of the EIR and any permits, including but not limited to, WMA and NPDES permits, that rely on this incorrect information. I respectfully request that the Secretary review this pursuant to the MEPA regulations at **301 CMR 11.10(5)**:

***Notice of Project Change Upon Secretary's Determination.** If the Secretary determines that a Proponent has, either knowingly or inadvertently, concealed a material fact or submitted false information during MEPA review, or has segmented the Project, the Secretary may consider the determination to be a Notice of Project Change*

I also request that DEP consider these apparent errors in relation to the WMA and NPDES permit and require submission by the applicant of corrected information, prior to issuance of permits. If permits have already been issued, they should be reconsidered and amended accordingly.

Please notify me as to your decision on how to proceed in response to this request. I hope that a month will provide sufficient time, therefore I request a response by May 27<sup>th</sup>.

### **Problems in analysis of river discharge**

StreamStats is a GIS-based program created by USGS that estimates river discharge at ungauged locations based on regression analysis from other, gauged sites.<sup>1</sup> In the case of the Westfield River, there is no gauge at the proposed Russell plant location, but there are gauges on each of the three branches of the river upstream of the site that characterize the majority of the flow at the proposed withdrawal point.

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<sup>1</sup> StreamStats web address: <http://water.usgs.gov/osw/streamstats/massachusetts.html>

The applicant's use of StreamStats to estimate the 7Q10 flow is inappropriate

The applicant utilized StreamStats to estimate the 7Q10 and median flows in the Westfield River, relying on these modeled estimates throughout the environmental impact report and follow-on documents. However, the StreamStats website recommends application of the model only to basins with drainage areas between 1.61 and 149 square miles, supporting error calculation only within this specified range.<sup>2</sup> The drainage area of the project site is 331 square miles, more than twice the accepted limit, but the EIR fails to mention this restriction on the use of the model outside the allowable range. By utilizing a computer model outside its recommended error limits the applicant has engaged in improper use of the model for permitting purposes.<sup>3</sup>

Actual gauging data should be used to calculate flow statistics on the Westfield River

Gauging data for all three branches of the Westfield River are available back to 1935,<sup>4</sup> and can be employed to estimate 7Q10 and median flows, either by summing values from the three branches, or by summing flow statistics computed separately for each branch. The applicant argues summing the individual 7Q10 values to obtain a single 7Q10 value is overly conservative, since dam operation on two of the branches, and differing weather conditions in watershed basins, may cause low flow events to occur at different times on the three branches.<sup>5</sup> However, it can equally be argued that this is a good reason to sum the individual 7Q10 flow values, because it is highly probable that low flow events can and will coincide under dam regulation, particularly during drought periods.

Gauging data from the Westfield River confirms that the 7Q10 flow of 32.4 cfs reported by the applicant is erroneous; in fact, the true 7Q10 value is significantly lower. Historically, gauging data from the three branches has been used by EPA to calculate 7Q10 values in the project vicinity for NPDES permitting. A letter from the Westfield Wild and Scenic Advisory Committee<sup>6</sup> states that the NPDES Permit for the Russell Wastewater Treatment Plant, located only 500 feet upstream of the proposed Russell plant intake structure, is 23.97 cfs, and that the 7Q10 for the downstream Woronoco WTP is 22.41 cfs. The applicant's response to the letter pointing out this discrepancy

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<sup>2</sup> The home page for the StreamStats website also provides a link to a report on methods for estimating low-flow statistics, accompanied by the following statement: "StreamStats reports the uncertainty of the estimates for basins with drainage areas between 1.61 and 149 mi<sup>2</sup>; errors for basins with drainage areas beyond these bounds are unknown. Although the application provides flow statistics at most any site, better estimates of streamflow statistics can generally be obtained by the drainage-area ratio method if the site of interest is between 0.3 and 1.5 times the drainage area of a gauged site on the same stream. The report describes how to implement this method."

<sup>3</sup> Information on the inapplicability of the StreamStats model was actually included in the DEIR; a coversheet for a scanned flow statistics report, included in Appendix H of the DEIR, states "Warning! Drainage area outside allowable range (Page 282 of the pdf containing Appendix H, included on the DEIR cd.)"

<sup>4</sup> Important gaps in the data record for the Middle and East branches exist for the 1990 – 1995, and for low-flow months in 1998. The unbroken gauging station record for the West branch indicates that critical low flow episodes occurred during these times that will thus not be reflected in record for summed gauges.

<sup>5</sup> p. 8-11 FEIR (p. 217 of pdf)

<sup>6</sup> p. 8-14 of FEIR (p. 220 of pdf).

from their 7Q10 value stated that “it may be that those estimates were not developed directly from using the StreamStats application, but rather from use of the individual gauging data from the three upstream stations”. Given the applicant’s inappropriate application of StreamStats data, the dismissal of using actual gauging data is particularly troublesome.

Several analyses of the proposed project’s impacts to the river depend on the estimated 7Q10 flow, therefore it is important to use a 7Q10 value which, if it errs, errs on the side of being protective of aquatic health. Analyses concerning the proportion of water withdrawn from the river by the plant, the effects of phosphorus-containing effluent on in-stream phosphorus concentrations, and the temperature effects of process water return<sup>7</sup> have all been based on the incorrect 7Q10 estimate in the FEIR, and should be revisited using a correct estimate for the 7Q10 flow.

The 7Q10 is not an adequately protective baseline given evidence for decreasing flows

The best available science on streamflow requirements for habitat protection, developed by USGS in cooperation with Massachusetts Department of Conservation and Recreation and the Massachusetts Division of Fisheries and Wildlife,<sup>8</sup> demonstrates that minimum flows to protect fish habitat and aquatic health are significantly greater than 7Q10 flows. While flows may fall below these levels naturally, permitting a project to take water when river discharge has fallen below the 7Q10 level is contrary to science-based conclusions. Further, climate change is expected to increase the frequency and severity of drought events in the Northeast,<sup>9,10</sup> reducing river flows and intensifying riverine pollution,<sup>11</sup> and the permitting process should recognize that water takings will be increasingly damaging to the Westfield River under these conditions.

Unfortunately, however, it appears that recent advances in the scientific understanding of climate change have not been mirrored in the regulatory process, which continues to operate without consideration for the climate of the near future. It is particularly urgent<sup>12</sup> that permitting for a plant intended to operate for decades should look forward, not backward, in projecting effects of water withdrawals, and acknowledge that past climate and river flows are no longer a good indicator of future conditions. This conclusion is

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<sup>7</sup> The incorrect 7Q10 value is repeated on page 6 of the Freshwater Mussel Survey, with regard to temperature impacts of process return water. The survey is included in Appendix F of the FEIR.

<sup>8</sup> Armstrong, D.S., Parker, G.W., and Richards, T.A. 2004. Streamflow characteristics at index streamflow-gauging stations in Southern New England. Water-Resources Investigations Report 03-4332. United States Geological Survey, Reston, VA.

<sup>9</sup> Frumhoff, P.C., et al. 2007. Confronting Climate Change in the U.S. Northeast: Science, Impacts, and Solutions. Synthesis report of the Northeast Climate Impacts Assessment (NECIA), Union of Concerned Scientists (UCS), Cambridge, MA.

<sup>10</sup> Hayhoe, K., et al. 2006. Past and future changes in climate and hydrological indicators in the U.S. Northeast. Climate Dynamics DOI 10.1007/s00382-006-0187-8.

<sup>11</sup> Marshall, E., and Randhir, T. 2008. Effect of climate change on watershed system: a regional analysis. Climatic Change DOI 10.1007/s10584-007-9389-2.

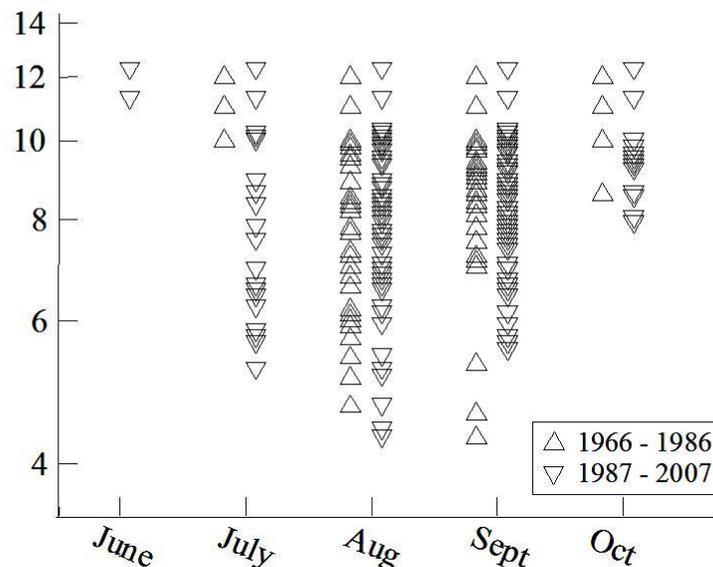
<sup>12</sup> It seems obvious that permitting for an energy plant that will ostensibly mitigate the causes of climate change would especially acknowledge climate warming effects on river flows.

supported by the most current science; indeed, a recent editorial by a USGS scientist in the journal *Science*<sup>13</sup> states,

“In view of the magnitude and ubiquity of the hydroclimatic change apparently now under way... we assert that stationarity is dead and should no longer serve as a central, default assumption in water-resource risk assessment and planning... Projections of runoff changes are bolstered by the recently demonstrated retrodictive skill of climate models. The global pattern of observed annual streamflow trends is unlikely to have arisen from unforced variability and is consistent with modeled response to climate warming.”

It is not necessary to rely on models to demonstrate that flow patterns are already changing on the Westfield River. A simple analysis of flow data from the undammed West branch of the river illustrates that critical low flow periods have increased in frequency and intensity in the last 20 years, relative to the preceding 20-year period. Figure 1 shows a comparison of the number of days in two 20-year blocks, 1966 – 1986 and 1987 – 2007, when flow was less than or equal to 12 cfs on the West Branch of the Westfield River. Data are plotted on a logarithmic scale to increase point separation.

Figure 1. Days when flow was 12 cfs or less, West Branch of the Westfield River  
Comparison of 1966 - 1986 and 1987 – 2007



<sup>13</sup> Milly, P.C.D., et al. 2008. Stationarity is dead: whither water management? *Science* 319: 573-574. Stationarity refers to the assumption that statistical properties such as the mean, variance, etc. are unchanging over time.

Because individual points are stacked and therefore indistinguishable on the graph, the number of points for each month is included in the following table, along with monthly flow averages (in cfs) by 20-year block, and the statistical p-value for t-tests that determine whether differences between the flow averages are significant.

Table 1.

	1966-1986		1987 - 2007		p-value
	<i>number of days</i>	<i>average flow</i>	<i>number of days</i>	<i>average flow</i>	
June	0	n.a.	3	11.3	n.a.
July	15	11.6	41	9.23	0.0008
August	83	9.69	116	9.08	0.049
September	115	9.79	125	9.01	0.001
October	26	11.33	26	9.27	<0.00001

The data above demonstrate that for each month from July to October, average flow was statistically and significantly lower for the 1987-2007 period than the 1966-1986 period. Further, in the 1987-2007 period, low flow events occurred in June, the number of low flow events more than doubled in July, and increased by 40 percent in August. This result is even more surprising given that the earlier of the two periods includes the notable 1965-1967 drought. While low flow conditions do not necessarily coincide with the highest summer temperatures, these data indicate that drought conditions are already occurring progressively earlier into the summer. As noted in the FEIR,<sup>14</sup> operation of the Russell plant will require that the maximum water withdrawal of 885,000 gallons per day occur on the hottest days of the year, meaning that peak water withdrawal needs will increasingly coincide with drought conditions under a changing climate.<sup>15</sup> The situation will be further exacerbated as high temperatures occur progressively later into the summer.<sup>16</sup>

The presence of gaps in gauging data for one or both of the Middle and East branches of the Westfield River means that summed flows for the river cannot be computed for some or all of the months of 1990 – 1995, and 1998. However, there is a continuous record of gauging data for the West branch. The following flow data (Figure 2), plotted on a logarithmic scale with the width of the stripes indicating event frequency, demonstrate that flow patterns on the West Branch are largely representative of patterns from summed flow of three branches. Although significant gaps exist in the summed flow data, extreme low flow events on the West branch during the data gap (events in 1991 and 1995 were among the lowest flows recorded on the West branch for the entire 1966 – 2007 period) indicate that flows were probably critically low on the main stem Westfield River, as well. This is particularly relevant given that data from these periods have been excluded

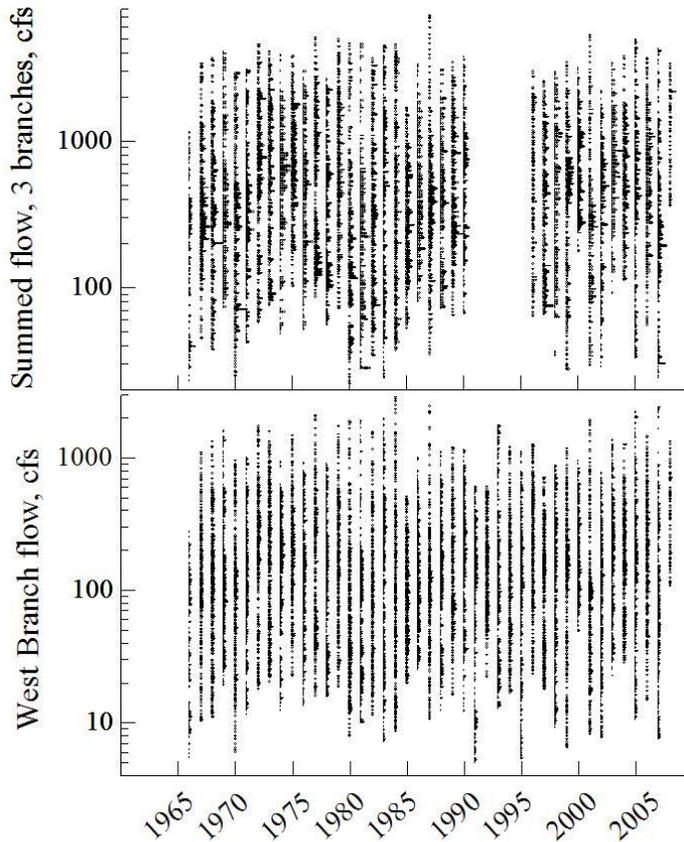
<sup>14</sup> Page 8-2 of FEIR (p. 208 of pdf).

<sup>15</sup> Decreased river discharge in a warmer climate will also impact power generation that relies directly on adequate flow. It is interesting to note that water blown off as steam by the Russell plant will no longer be available to generate hydroelectric power at the Low-Impact certified hydroelectric project located downstream on the Westfield River (<http://www.lowimpacthydro.org/application-details.aspx?id=21>).

<sup>16</sup> Frumhoff et al, 2008.

from consideration in the environmental impact reports, and thus do not contribute to the hydrological analysis.

Figure 2. Comparison of flow patterns for summed flow of West, Middle, and East Branches of the Westfield River, versus flow of West Branch



In general, the applicants understate the frequency and intensity of low flow events on the Westfield River in the environmental impact statements and follow-on documents. For instance, in the FEIR, while referring to the single lowest flow day recorded since construction of the two dams upstream of the project site (17.8 cfs, on August 19<sup>th</sup>, 1970), the applicant states

“dams control flow for two of the three branches of the Westfield River, and, although “run of the river” may be typical operation at the dams, there are times when flow is controlled for one or both dams for repair work, reservoir buildup, or emergency situations. Therefore, the single lowest flow day is not a reliable or useful measurement to determine potential impacts for the proposed withdrawal.”

In the response to the Order to Complete, they again state: “the single lowest flow day may not be a very accurate, or, more importantly, useful measurement to determine potential impacts for the proposed withdrawal.”<sup>17</sup>

These statements are misleading for two reasons. First, this particular day of low flow (on August 19<sup>th</sup>, 1970) was in fact the penultimate day of an 11-day period when combined discharge from the three gauged stations was 33 cfs or below (close to the applicant’s estimate of 32.4 cfs for the 7Q10 at the proposed project site) and within that 11-day period there were four days when flow was 25 cfs or below. Statements that low-flow days are “not representative” therefore obscure the fact that there are multiple instances in the discharge record when summed flow from the three branches has been less than 25 cfs. Second, the statements are misleading because they imply that when low-flow events are derived from direct human factors such as dam operation, they have less of an effect on aquatic organisms than if they are drought-induced. Flows on the Westfield River already differ significantly from natural flow regimes due to dam operation, and such impacts will be exacerbated if water takings at the dams increase.

The applicant repeatedly states in the environmental impact reports and the response to the Order to Complete that water takings by the project will constitute “just” 5, or 6, or upwards of 7 percent of the river’s total flow even at critical low flow periods – reasoning that appears to have been accepted by MassDEP. However, the absence of any minimum protective standard for flows means that decisions about what takings are allowed can be arbitrary and are not based on science, but instead upon precedent, following shifting standards that have served Massachusetts rivers poorly in the past. In any case, the argument that there is little impact from small percentage takings of minimum recorded flows is specious for three main reasons. First, percentages are scale-free, and therefore stating that only a small percentage is being taken obscures the fact that at low flows, fish, mussel, and other invertebrate habitat are already compromised and further water takings can push these animal communities beyond the point of recovery. It takes less than a day of extreme low flow to wipe out fish and other aquatic life. Second, low flow conditions on the river are likely accompanied by elevated phosphorus conditions which will be further increased by phosphorus discharged from the Russell plant, with implications for aquatic health. Finally and most importantly, a range of discharge indices<sup>18</sup> indicate that maintenance of native fish habitat requires maintenance of minimum yields per unit watershed area. Which indices are best or most relevant may be open to argument, but what is beyond dispute is that estimates relevant to the Westfield all exceed basin yield levels that already occur on the Westfield and that will be exacerbated by water takings at the Russell plant.

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<sup>17</sup> Response to Order to Complete, p. 4

<sup>18</sup> Armstrong et al, 2004.

## Problems in analysis of water quality impacts

The applicant misstates the EPA water quality criterion for phosphorus by a factor of 10

Despite claims by the applicant to the contrary, phosphorus discharges by the Russell plant into the Westfield River are likely to compromise the biological integrity of the river. Claims of no impact in the DEIR and FEIR are only possible because the applicant fails to report the Current National Water Quality Criteria for phosphorus, stating the phosphorus criterion to be 0.1 mg/L<sup>19</sup> instead of the correct value of 0.01 mg/L, the value recommended since 2002<sup>20</sup> for rivers and streams of Ecoregion VIII, where the Westfield River is located. In fact, a recent effort by USGS to refine nutrient criteria for Massachusetts waters recommends that the standard for Ecoregion VIII be set at 0.009 mg/L, even lower than the current EPA advisory level.<sup>21</sup>

The analysis of phosphorus effects is also flawed because the applicant has estimated the effect of phosphorus discharges by the Russell plant on in-stream phosphorus concentrations using to the incorrect 7Q10 value of 32.4 cfs as a basis for calculations, thus concluding that the resulting in-stream phosphorus concentration of 0.037 mg/L is well within allowable levels. However, this phosphorus concentration is 370 percent over the current EPA water quality advisory standard, and would be even higher – over 500 percent of the standard – at times when existing in-stream phosphorus concentrations exceeded 0.03 mg/L and when flows were lower than 32.4 cfs.<sup>22</sup>

Elevated phosphorus concentrations will affect in-stream habitat for endangered species. Along with providing habitat to numerous species of fish and supporting the state's program to reintroduce Atlantic salmon, the Westfield River is home to endangered freshwater mussel species, which are among the most endangered groups of animals in

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<sup>19</sup> Page 11-30 of DEIR (p. 215 of pdf)

<sup>20</sup> The table of “non-priority pollutants”

(<http://www.epa.gov/waterscience/criteria/wqcriteria.html#P2>) refers to EPA's Ecoregional Criteria documents for setting nutrient criteria for freshwater systems. The document containing the 0.01 mg/L recommendation for phosphorus in Nutrient Ecoregion VIII is downloadable at [http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/rivers/rivers\\_8.pdf](http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/rivers/rivers_8.pdf)

<sup>21</sup> From page 1 of the report's executive summary: “The U.S. Environmental Protection Agency (USEPA) recommends the 25th-percentile value of a water-quality constituent as the numerical nutrient criterion when using all available data for the constituent. In this study of Massachusetts waters, the 25th percentiles of median values at all sampling stations were: total phosphorus, 0.019 milligram per liter (mg/L)... When the data are sorted by the two USEPA nutrient ecoregions in Massachusetts (VIII and XIV), the new values are: for **Ecoregion VIII, total phosphorus, 0.009 mg/L.**” (From Zimmerman, M.J. and K.W. Campo. 2007. Assessment of data for use in the development of nutrient criteria for Massachusetts rivers and streams. USGS Scientific Investigations Report 2007-5022. United States Geological Survey, Reston, Virginia.)

<sup>22</sup> The applicant's value of 0.1 mg/L for the phosphorus criterion also renders incorrect their statement (FEIR, p. 9-10; p. 239 in the pdf) that “if the Massachusetts Water Quality Criteria were used to calculate a discharge limitation for phosphorus in the plant discharge, the resulting limitation would be calculated as 15.8 mg/L. This is far greater than the estimated maximum discharge concentration of 1.2 mg/L.” This calculation depends on the incorrect value for the 7Q10 flow, as identified above, as well as the assumption that there is zero phosphorus in riverwater diluting effluent from the plant.

the United States.<sup>23</sup> Even relatively small increases in riverine phosphorus concentrations have been linked<sup>24</sup> to declines in freshwater mussel populations and species diversity. While the environmental impact reports for the Russell plant included an assessment of in-stream habitat for freshwater mussels in the vicinity of the proposed water intake, no consideration has been given to the possibility that mussel and fish habitat can be compromised by nutrient loading, which will affect the entire river downstream of the project site.

Existing data are not adequate to characterize phosphorus levels in the Westfield River

In the environmental impact reports, the entire evaluation of phosphorus loading effects by the Russell plant was based on four water quality samples collected by DEP at two sites on four dates in 2001. These data are not adequate to characterize the present state of phosphorus loading in the Westfield River, particularly during low flow periods. Phosphorus in aquatic systems is usually derived from a combination of point and non-point sources. Where point sources (like municipal discharges) are important sources of phosphorus loading, in-stream phosphorus concentrations are likely to increase when river flow is low and dilution potential diminished. The 2001 DEP Water Quality Assessment found a high reading of 0.03 mg/L phosphorus, exceeding the EPA phosphorus criterion of 0.01 mg/L, but river discharge on the measurement dates was seasonally moderate and river phosphorus concentrations are therefore unlikely to have been representative of those at low-flow conditions.<sup>25</sup> Further, historical data from EPA's Storet database indicate that phosphorus concentrations on the river can be considerably higher than those measured in 2001. Phosphorus<sup>26</sup> concentrations below the Littleville Dam ranged from 0.05 to 0.29 mg/L in June, July and August of 1973 and 1974; measurements taken at a site in Dayville above the dam were 0.23 mg/L; measurements from the same period at the Knightville Dam ranged from 0.07 to 0.17 mg/L. All three of these sites are located upstream of significant population centers. Phosphorus concentrations of 0.24 to 0.53 mg/L measured downstream of the City of Westfield in August 1971 were probably high due to minimal water treatment facilities at that time, but the current state of the lower part of the river, ranked by the state as impaired for taste, odor, color, noxious aquatic plants, and turbidity<sup>27</sup>, suggests that phosphorus levels are likely still high and contributing to cultural eutrophication.

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<sup>23</sup> Allen Press. "Why Are Freshwater Mussels In Decline?." ScienceDaily 21 September 2007. 20 April 2008 <<http://www.sciencedaily.com/releases/2007/09/070914163735.htm>>

<sup>24</sup> USGS (2000). What makes a healthy environment for freshwater mussels? USGS Fact Sheet 124-00. United States Geological Survey, Washington, DC. Available online at <http://ublib.buffalo.edu/libraries/e-resources/ebooks/records/eel1264.html>

<sup>25</sup> Summed flow from the three upstream gauges, adjusted for ungauged area, on sample collection dates: 8/01/01: 83.1cfs; 8/22/01: 45.2 cfs; 9/12/01: 72.6 cfs; 10/03/01: 115 cfs. These flow levels do not represent low-flow conditions on the Westfield River, when flows are in the low- to mid-20's. On three of the dates (not 9/12/01), flow was higher in the five days previous and decreased to the sample date. There are no samples from periods when prolonged low flow conditions preceded nutrient measurement.

<sup>26</sup> Phosphorus is variously measured as phosphate and total P; all concentrations reported here were converted as necessary and are expressed as the concentration of phosphorus, only.

<sup>27</sup> Dunn, W. and Kennedy, L. 2005. Westfield River Watershed 2001 Water Quality Assessment Report, report number 32-AC-1. Massachusetts Department of Environmental Protection, Division of Watershed Management, Worcester, Mass.

Photographs<sup>28</sup> from the Westfield River, taken on October 8 2007 slightly downstream of the site of the proposed Russell plant, provide evidence that cultural eutrophication is occurring during low flow events far above the section of the river than has been ranked as impaired (Figure 3).

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<sup>28</sup> Used with permission from Henry Warchol



Figure 3 Westfield River, October 8, 2007

Flow at the project site on the picture date of October 8, 2007 (calculated as the summed flow of the three upstream branches, adjusted upward to reflect additional watershed area not included in gauged data) was 35.1 cfs, slightly higher than the 32.4 cfs 7Q10 flow calculated by the proponent. Along with illustrating what a flow in the mid-30's cfs actually looks like, these pictures of the Westfield River clearly show extensive algal

growth, similar to conditions reported further downstream<sup>29</sup> in sections of the river that are acknowledged by MassDEP as impaired.

Although the approval process for the Russell plant is nearly completed, there have been surprisingly few efforts to characterize and summarize water quality and permitted discharges on the Westfield River.<sup>30</sup> The 17.8 mile stretch of the Westfield from Huntington to Westfield appears on the list of “Waters requiring a TMDL” included in the Massachusetts Year 2006 Integrated List of Waters. However, the project applicant states in the FEIR<sup>31</sup> that MADEP has “not identified a time-frame to initiate TMDL for this basin. This has not been identified as having high priority for the MADEP or for the USEPA.” The recently issued Certificate from the Secretary appears to accept this as a valid reason for not requiring an assessment of potential phosphorus loading impacts on the river, stating “The Proponent states in the FEIR that it consulted with MassDEP who indicated that the development of a TMDL has not been identified as a high priority for MassDEP or the USEPA.”<sup>32,</sup>

Failure to characterize the state of water quality on the Westfield prior to permitting more water takings and pollutant discharges is an abrogation of the state’s responsibility – a responsibility to protect a river that has been identified as premier habitat for fish and endangered mussel species, that supports a multi-million dollar effort by the state to reintroduce Atlantic salmon, and that is already impaired by cultural eutrophication. Given the lack of phosphorus data on the Westfield River, and the obvious evidence of cultural eutrophication, it is imperative to develop permissible loading scenarios before another facility is permitted to discharge phosphorus at even higher concentrations than have been allowed on the river.<sup>33</sup>

## **Conclusions**

In summary:

1. The applicant inappropriately applied the StreamStats program to estimate low flows, resulting in overestimation of the 7Q10 and median flows at ungauged location of the proposed Russell plant. Actual gauging data should be used to calculate streamflow statistics, taking into account that some recent low flow events have not been recorded due to gaps in the gauging data record. Following

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<sup>29</sup> Dunn and Kennedy, 2005.

<sup>30</sup> It appears, for instance, that despite the proposal by the applicant to discharge relatively high concentrations of aluminum into the Westfield River, the only background data on current in-stream aluminum concentrations is taken from Texon NPDES monitoring data. The DEIR reports that concentrations of aluminum were more than an order of magnitude higher than the EPA aquatic health criterion, but dismisses the data, stating that the high concentrations probably reflect “naturally occurring aluminum in soils particles” and are thus not bioavailable (p 11-5 DEIR, p. 190 of pdf). However, it appears that no follow-up testing has been conducted to test this supposition.

<sup>31</sup> FEIR page 9-8; page 237 of pdf.

<sup>32</sup> Page 28 of the Certificate of the Secretary of Energy and Environmental Affairs on the Final Environmental Impact Report, March 28, 2008

<sup>33</sup> The NPDES permit for the Westfield WPCF allows phosphorus discharges at 1 mg/L; permitted discharges for the Russell plant will be at 1.2 mg/L.

estimation of properly conservative streamflow statistics, analyses of environmental impacts that depend on the 7Q10 and median flows should be revisited, including the proportion of total flow proposed to be taken by the proposed plant, phosphorus loading effects, and temperature effects.

2. The applicant, as well as the review process of the environmental impact reports up to this point, have not acknowledged that past river discharge records are likely to be a poor indicator of future conditions under a changing climate. The permitting process should acknowledge that frequency and severity of low flow events in the Westfield River system are increasing and that there is a significant degree of uncertainty regarding future flows in the river.
3. The applicant overstated the current Water Quality Criterion for phosphorus by an order of magnitude, leading to erroneous estimates of project-related phosphorus impacts to the Westfield River. The entire rationale for allowing phosphorus discharges by the applicant into the Westfield River is based on samples collected at two locations on four dates in 2001, data which almost certainly do not represent phosphorus concentrations in the river during low-flow events. Responsible planning and impact assessment of phosphorus loading by the Russell plant is also hampered by the use of the incorrect 7Q10 value, and the lack of a TMDL for the Westfield River. More data on water quality in the Westfield River, particularly during low-flow events, should be collected to evaluate impacts by the proposed plant.

In light of the information presented above, I request that the Secretary and DEP review the apparent errors in the information and analysis presented by the applicant, and require further MEPA review and adjustments to permit applications and permits as appropriate. Kindly notify me as to your decision on how to proceed in response to this request by May 27<sup>th</sup>.

Sincerely,

Mary S. Booth

cc:

Deerin Babb-Brott, MEPA

Briony Angus, MEPA

Jim D. Bumgardner, MassDEP

Paul Hogan, MassDEP

Mark.Schleeweis, MassDEP

Robert McCollum, MassDEP

Mary Griffin, Fish and Game

Representative Rosemary Sandlin

Senator Michael Knapik

Senator Stan Rosenberg

Representative Steven Kulik

Representative Peter Kocot

Representative Ellen Story

Senator Frank Smizik

Senator Pam Resor

Timothy Brennan, PVPC

Judith Eisman, Kestrel Trust

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Heidi Ricci, Mass Audubon