

**DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**BOARD ORDER**

IN THE MATTER OF

|                                     |   |                            |
|-------------------------------------|---|----------------------------|
| RUMFORD PAPER COMPANY               | ) | MAINE POLLUTANT DISCHARGE  |
| Rumford, Oxford County              | ) | ELIMINATION SYSTEM PERMIT  |
|                                     | ) | AND                        |
|                                     | ) | WASTE DISCHARGE LICENSE    |
| PULP & PAPER MANUFACTURING FACILITY | ) | FINDINGS OF FACT AND ORDER |
| #ME0002054 and #W000955-5N-G-R      | ) | ON APPEAL                  |

Pursuant to the provisions of 38 M.R.S.A. Section 341-D and *Rules Concerning the Processing of Applications and Other Matters*, 06-096 CMR 2 (effective April 1, 2003), the Board of Environmental Protection has considered the appeals of (a) RUMFORD PAPER COMPANY, (b) FPL ENERGY MAINE HYDRO LLC, and (c) CONSERVATION LAW FOUNDATION, MAINE RIVERS, ANDROSCOGGIN RIVER ALLIANCE, and ANDROSCOGGIN LAKE IMPROVEMENT ASSOCIATION of the Department's Order of September 21, 2005 issuing a combined waste discharge license and Maine Pollutant Discharge Elimination System permit, with conditions, for the discharge of treated industrial process and other wastewaters to the Androscoggin River from a kraft pulp and paper mill. Based on a review of the materials submitted by the appellants and the applicant, the record of the Board's public hearings on this and related appeals, and other related materials on file, the Board makes the following findings of fact, conclusions, and decision.

1. INTRODUCTION

The Rumford Paper Mill, located in Rumford, Oxford County, Maine, is an integrated pulp and paper mill that manufactures bleached kraft pulp and fine coated papers. Process waste waters and other waste waters associated with the facility receive primary clarification, biological treatment using activated sludge, aeration, and secondary clarification at an on-site waste water treatment plant. The treatment plant also receives and treats leachate from the Farrington Mountain Landfill.

By Order #W000955-5N-G-R and #ME0002054 dated September 21, 2005, the Department issued a combined waste discharge license and Maine Pollutant Discharge Elimination System permit (hereinafter "permit") for the discharge of up to a monthly average of 34 million gallons per day of treated industrial process and other waste waters to the Androscoggin River from the Rumford mill, subject to a number of conditions. These conditions included, among other things: specified limitations on the discharge of various pollutants (including biochemical oxygen demand, total suspended solids, total phosphorus, and ortho-phosphorus); and the injection of specified amounts of additional oxygen into Gulf Island Pond, or other equivalent measures. These conditions were imposed so that the discharge from the mill, either by itself or in combination with other discharges, will not

lower the quality of the Androscoggin River below its assigned Class C water quality standards.<sup>1</sup>

The Rumford Paper Mill is owned and operated by Rumford Paper Company (“RPC”).

On October 21, 2005, timely appeals of the Department’s September 21, 2005 decision were filed by RPC, by FPL Energy Maine Hydro LLC (“FPLE”), and by the Conservation Law Foundation, Maine Rivers, Androscoggin River Alliance, and Androscoggin Lake Improvement Association (collectively, “CLF, et al.”).<sup>2</sup>

On May 11, 2006, the Department circulated for public comment a draft modification to the permit that would eliminate or shorten the schedules of compliance for several pollutants. By Order #W000955-5N-H-M and #ME0002054 dated August 7, 2006, the Department modified the license and permit as per the May 11, 2006 draft.<sup>3</sup> Both FPLE and CLF, et al. filed timely appeals of the modification of the RPC permit.

By letter dated November 13, 2006, RPC submitted a response to the issues raised on appeal by FPLE and CLF, et al.

## 2. APPLICABLE STANDARDS OF APPEAL

Title 38 M.R.S.A. Section 341-D(4) provides that, in acting on an appeal, “the Board is not bound by the Commissioner’s findings of fact or conclusions of law but may adopt, modify or reverse findings of fact or conclusions of law established by the Commissioner.” The Board is required to make its own findings and draw its own conclusions based upon the record before it, as well as its interpretation and application of the relevant law. Section 24(B)(7) of the Department’s Chapter 2 Rules provides that “the Board shall, as expeditiously as possible, affirm all or part, affirm with conditions, order a public hearing to be held as expeditiously as possible, or reverse all or part of the decision” that has been appealed to the Board.

## 3. STANDING

Appellant RPC is the licensee and owner of the waste water treatment plant that is subject to the Department’s September 21, 2005 licensing decision for the Rumford mill. RPC is thus an aggrieved person as defined by the Department’s Chapter 2 *Rules Concerning the*

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<sup>1</sup> In its September 21, 2005 order, the Department found Gulf Island Pond to be in non-attainment of Class C water quality standards for dissolved oxygen and for the designated use of recreation in and on the water. The Department also found the Livermore Falls impoundment to be in non-attainment of Class C water quality criteria for aquatic life.

<sup>2</sup> A summary of the appeals and appeal proceedings is appended hereto and incorporated herein.

<sup>3</sup> In a First Procedural Order dated July 10, 2006, the Board’s Presiding Officer for the consolidated Androscoggin River appeals ruled that the Department may proceed to finalize the proposed modification of RPC permit and that the Board would incorporate the modified permit, and any appeals thereof, into the record of the pending appeals of that permit. See attached summary of appeals and appeal proceedings, page 17.

*Processing of Applications and Other Matters* and has standing to bring an appeal before the Board.

Appellant FPLE is the licensee and owner of the hydropower project that creates Gulf Island Pond, which receives waste water from the Rumford mill. FPLE may suffer particularized injury as a result of the Department's September 21, 2005 licensing decision for the Rumford mill, in that FPLE is also being required to inject supplemental oxygen into Gulf Island Pond under the terms of the Department's September 21, 2005 water quality certification for the Gulf Island-Deer Rips Hydro Project. FPLE is thus an aggrieved person as defined by the Department's Chapter 2 *Rules Concerning the Processing of Applications and Other Matters* and has standing to bring an appeal before the Board.

Finally, Appellants Conservation Law Foundation, Maine Rivers, Androscoggin River Alliance, and Androscoggin Lake Improvement Association (collectively, "CLF, et al.") are all non-profit corporations or associations whose members may suffer particularized injury as a result of the Department's September 21, 2005 decision for the Rumford mill. Conservation Law Foundation's mission is to conserve natural resources, protect public health and promote vital communities in New England. Maine Rivers' mission is to preserve and enhance the quality of all Maine rivers. Androscoggin River Alliance and Androscoggin Lake Improvement Association are organized to improve and protect the environmental quality of the Androscoggin River. Each of these organizations is thus an aggrieved person as defined by the Department's Chapter 2 *Rules Concerning the Processing of Applications and Other Matters* and has standing to bring an appeal before the Board.

#### 4. BASIS OF THE RPC APPEAL

Appellant RPC argues that the provision of the permit requiring that RPC participate in the installation and operation of an additional oxygen injection system is based on a flawed and inadequate analysis of oxygen injection, an improper rejection of attainment of standards through improved mixing, and establishes requirements that may be impossible to implement.

Appellant RPC further argues that the requirement of the permit that RPC participate in ambient water quality monitoring is inconsistent with other monitoring provisions, in that it fails to set an annual cap on expenditures, contains no endpoint criteria or date for terminating the monitoring program, and is too broad in the scope of sampling locations.

Appellant RPC requests that the Board eliminate RPC's requirement to provide additional oxygenation into Gulf Island Pond, or in the alternative, that the Board make any requirements for additional oxygen injection contingent upon the guaranteed availability of a fully permitted site to build the oxygen injection system. Appellant RPC further requests that a proper analysis of options for improving mixing in the pond not be precluded as a means of achieving attainment of dissolved oxygen standards.

## 5. BASIS OF THE FPLE APPEAL

Appellant FPLE argues that the provisions of the Department's decision regarding the allocation of responsibility to RPC for additional oxygen injection into Gulf Island Pond are legally and factually erroneous, and incorporates by reference its appeal of the water quality certification for the Gulf Island-Deer Rips Project. Specifically, FPLE contends that RPC and the other point sources discharging into Gulf Island Pond are responsible for bearing the burden of additional oxygen injection.

In its appeal of the water quality certification for the Gulf Island-Deer Rips Hydro Project, Appellant FPLE requests that the Board eliminate the requirement for FPLE to inject additional oxygen into Gulf Island Pond, and further requests that the Board reallocate this responsibility to RPC and other appropriate parties.

## 6. BASIS OF THE CLF, et al. APPEAL

Appellant CLF, et al. argues that the five year schedule of compliance for final effluent limitations for various pollutants (including total phosphorus, ortho-phosphorus, and summertime TSS), as well as the five year schedule of compliance for the oxygenation injection system imposed in the September 21, 2005 permit violates state and federal law. Specifically, and in summary, CLF, et al. contends that: (1) state and federal law prohibit the use of a compliance schedule when setting final effluent limitations that are necessary to attain the pre-July 1, 1977 dissolved oxygen standard of 5 parts per million, and that this prohibition extends to the oxygenation system requirement because oxygenation is being used to achieve compliance with the dissolved oxygen standard; (2) the approved compliance schedules violate the requirement of state law that schedules of compliance must be as short as possible, based on consideration of the technological, economic and environmental impact of the steps necessary to attain water quality standards; and (3) the approved compliance schedules violate the requirement of the Department's rules that schedules of compliance exceeding one year must include interim requirements and the dates for their achievement.

Appellant CLF, et al. requests that the Board modify the permit approved by the Department to require immediate attainment of all final effluent limitations and immediate completion of the additional oxygen injection system or, if the Board determines that a compliance schedule for additional oxygen injection is legal, to require attainment of water quality standards in as short a time as possible and to impose specific interim enforceable requirements.

## 7. RESPONSE TO APPEALS

In response to the appeals filed by FPLE and CLF, et al., RPC argues that:

- The Department has the authority to (1) require that FPLE remedy any and all adverse effects of Gulf Island Dam on the water quality of the river and (2) impose oxygen injection conditions on the water quality certification for FPLE's hydropower project;

- Gulf Island Dam causes or contributes to the non-attainment of dissolved oxygen standards;
- FPLE should bear the vast majority, if not all, of the additional oxygen injection allocation; and
- Schedules of compliance are lawful in general, and the schedules of compliance set forth in the RPC license, as modified by the Department, are both lawfully structured and supported by substantial evidence in the record.

## 8. PROCEDURAL HISTORY

On August 3, 2006, the Board voted to schedule a consolidated public hearing on the pending appeals of the permit for RPC's Rumford pulp and paper mill and the related appeals of the water quality certification for FPLE's Gulf Island-Deer Rips Hydro Project<sup>4</sup> and the permit for Verso Paper's Jay pulp and paper mill.<sup>5</sup>

An adjudicatory hearing to receive testimony from the parties and the general public on whether the legal standards for wastewater discharge permits and for water quality certification, as set forth in federal and state law and applicable regulations, have been met was held on May 2, 3, 4, 8 and 9, 2007 in Auburn and on May 10 in Augusta. Daytime sessions were devoted to testimony from and cross-examination of witnesses called by the parties. Evening sessions on May 3 and 8 were devoted to receiving testimony from members of the general public.

## 9. DISCUSSION OF RPC APPEAL

Appellant RPC essentially argues that its required participation in the existing oxygenation facility more than compensates for the Rumford mill's discharge into Gulf Island Pond and that, as a consequence, it should not be subject to any requirements for additional oxygenation. [see pre-filed testimony of RPC witness Scott Reed]. Appellant RPC also argues that it is reasonable to use the Department's Total Maximum Daily Load (TMDL),<sup>6</sup> and the water quality model on which it is based, while not perfect, as the basis for

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<sup>4</sup> By Order #L-17100-33-O-N dated September 21, 2005, the Department issued water quality certification for the continued operation of the Gulf Island-Deer Rips Hydro Project, located on the Androscoggin River in Lewiston, Auburn, Turner, Greene, Leeds and Livermore, Maine. Appeals of this decision were filed by FPLE and CLF, et al. An additional appeal filed by the Towns of Livermore and Jay was subsequently withdrawn pursuant to a Stipulation and Consent Order approved by the Board on May 2, 2007.

<sup>5</sup> By Order #W000623-5N-F-R and #ME0001937 dated September 21, 2005, the Department issued a combined waste discharge license and Maine Pollutant Discharge Elimination System Permit for the discharge of treated waste waters to the Androscoggin River from a kraft pulp and paper mill in Jay, Maine. Appeals of this decision were filed by International Paper (now Verso Paper or "Verso," licensee), NRCM, CLF, et al., and FPLE.

<sup>6</sup> A TMDL establishes the allowable pollutant loadings or other quantifiable parameters for a waterbody and thereby provides the basis for the establishment of effluent discharge limits and other controls necessary for the waterbody to meet water quality standards. See "Guidance for Water Quality-based Decisions: The TMDL Process," EPA 440/4-91-000 (April, 1991).

permitting decisions, subject to future modification and re-calibration based on additional monitoring data. [see pre-filed testimony of RPC witness Thomas Gallagher].

Other appellants in the related proceedings have argued that the Department's TMDL and water quality model is fundamentally flawed in various respects, and one appellant (NRCM) has argued that a TMDL is simply not needed.

a. Model Corrections and Additional Modeling

The Board is persuaded that a TMDL is an appropriate and perhaps a necessary legal basis for any decision in this case to impose effluent limits on point source dischargers and oxygen injection requirements on these dischargers and FPLE. In this complex case, which involves the impacts of non-point source pollution, multiple point source discharges at various locations on the river, and a large dam and impoundment, all the evidence points to the need for a water quality model to predict dissolved oxygen levels in Gulf Island Pond and a TMDL to define the combination of pollutant loadings and oxygen injection needed to bring about compliance with Class C water quality standards. The Board finds that NRCM's arguments that effluent limits can be established solely by extrapolating from past mill performance are not persuasive.

The Board is further persuaded that the current TMDL, which has been approved by EPA, is sufficient to make regulatory decisions. Many of the "flaws" identified by the appellants relate to differences of opinion among experts regarding various assumptions made in the underlying model, as opposed to actual errors in the model. The Board finds that the nature of water quality modeling makes any complex model, such as the one developed and relied upon by the Department here, susceptible to some degree of criticism from other modelers. However, the Board finds that the Department's modeling assumptions are well grounded in science and are reasonable. Specifically, the Board finds the testimony of former DEP modeler Paul Mitnik regarding the development of the model used by the Department to be credible and convincing. [see Paul Mitnik's hearing testimony at Transcript pp. 782-1001]. The Board also finds that, after more than twenty years of study, there is ample technical information upon which to base the necessary regulatory decisions, and the time has come to take the actions needed to bring Gulf Island Pond into compliance with water quality standards.

However, as discussed below, the Board is persuaded by the preponderance of the evidence that there are two revisions that should be made to the model.

The first model revision is the re-calibration of the model following the correction of a dispersive mixing error. FPLE witness David Dilks provided compelling evidence that the original DEP model incorrectly assumed that water was flowing upstream through Gulf Island Dam and that, while the DEP recognized and corrected this error in the final TMDL, the DEP did not re-calibrate the model to ensure that model results still

accurately predicted the observed dissolved oxygen levels in Gulf Island Pond.<sup>7</sup> This re-calibration may reduce the model prediction of the amount of oxygen injection needed to meet standards and may reduce the amount of oxygen that entities would be responsible for injecting into Gulf Island Pond.<sup>8</sup>

The second model revision is the recalculation of the area of sediment in contact with various segments of the pond. Verso witness John Connolly provided convincing evidence that, in specifying the amount of phosphorus coming from the sediment underlying each model segment of Gulf Island Pond, the DEP model incorrectly assumed that the full width of the bottom of each segment, not just the bottom segments, was in contact with the sediment and that the DEP needs to recalculate the sediment area that is contributing phosphorus to the pond.<sup>9</sup> This recalculation may reduce the model's prediction of the total sediment phosphorus loading to the pond and thus may increase the amount of phosphorus that the model predicts can be discharged to the pond from point sources while still attaining water quality standards.<sup>10</sup>

Therefore, the Board directs the Department to make the revisions to the model discussed above and, if necessary, revise the TMDL accordingly. The Board further directs the Department to determine, as soon as practical, and in any event before June 1, 2010, final additional oxygen injection requirements and final point source effluent limits for phosphorus based on the revised model and any subsequent revisions to the TMDL.

Finally, Verso witness John Connolly provided persuasive evidence that the development and use of a hydro-dynamic model to determine mixing and transport within Gulf Island Pond may more accurately predict water quality conditions than does the Department's current model.<sup>11</sup> Using such a model may change point source pollutant loadings and the amount of oxygen injection needed to meet standards in the pond. However, in keeping with recent legislation,<sup>12</sup> the development of an additional model should be paid for by RPC, either independently or in cooperation with other point source dischargers. Also, the hydro-dynamic model used must be supported by the Environmental Protection Agency.

While a future hydro-dynamic model could eventually support amended effluent limitations or oxygen injection requirements, it is the Board's considered judgment that it

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<sup>7</sup> See Dr. Dilks' pre-filed direct testimony at FPLE Tab 5, and Dr. Dilks' hearing testimony at Transcript pp. 1063-1089.

<sup>8</sup> Dr. Dilks states that he ran the Department's model following re-calibration and determined that the oxygen needed from the existing GIPOP facility to meet standards with the point source discharges removed (and thus with unknown sediment oxygen demand and non-point source impacts remaining) dropped from 105,000 pounds per day to 52,800 pounds per day under critical conditions. See Exhibit FPLE 51.

<sup>9</sup> See Dr. Connolly's pre-filed direct testimony, and Dr. Connolly's hearing testimony at Transcript pp. 413-441.

<sup>10</sup> Dr. Connolly states that he made such a correction for the sediment area and determined that the total sediment phosphorus load dropped from 49 kilograms per day to 21 kilograms per day. See Connolly pre-filed direct testimony at page 39.

<sup>11</sup> See Dr. Connolly's pre-filed direct testimony, and Dr. Connolly's hearing testimony at Transcript pp. 413-425.

<sup>12</sup> P.L. 2005, Chapter 409, "An Act To Amend Water Quality Standards," (L.D. 1450).

is neither necessary nor prudent to wait for the development of such a model, and that the Department's existing modeling provides a sound basis for the Board's actions today.

b. RPC's Additional Oxygenation Requirement

For the reasons discussed below, the Board finds that Appellant RPC has not presented persuasive evidence calling into question the Department's methodology for determining RPC's level of responsibility for mitigating the impact of its discharge on dissolved oxygen levels in Gulf Island Pond.

The evidence in the record indicates that, in order to address water quality problems in Gulf Island Pond, the Department developed a water quality model to predict water quality in the pond under different pollutant loading and oxygen injection conditions. The Department then ran the model with upstream point source discharges set at recommended effluent limits and with the existing oxygen injection system in operation. The model predicted that, absent additional oxygen injection, and under summer low flow and high water temperature conditions,<sup>13</sup> there would be significant non-attainment of minimum Class C dissolved oxygen standards in Gulf Island Pond below depths of 20 feet.<sup>14</sup> The Department then made iterative runs of the model while providing increased amounts of oxygen injection into the pond. The model predicted that the injection of 105,000 pounds per day of oxygen at Upper Narrows (the location of the current GIPOP facility, about 5 miles upstream from Gulf Island Dam), and the injection of 105,000 pounds per day of oxygen at Lower Narrows (about 3 miles upstream from the dam), at an existing oxygen efficiency transfer rate of 33%, would be needed to meet dissolved oxygen standards.<sup>15</sup> The Department then made iterative runs of the model to determine the amount of oxygen needed to meet dissolved oxygen standards with upstream point sources set at zero and assigned the responsibility for this oxygen injection to FPLE.<sup>16</sup> Finally, in its September 21, 2005 permit for the Rumford mill, the Department allocated a share of the remaining oxygen injection requirement to RPC based on its percentage of pollutant loading to Gulf Island Pond, as determined by the Department's water quality model.<sup>17</sup>

Essentially, RPC's argument is that it should not be responsible for anything more than is required of it under the existing GIPOP Partnership Agreement, which amounts to 38% of annual GIPOP operating and maintenance costs. Thus, under this agreement, RPC

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<sup>13</sup> In order to ensure that dissolved oxygen standards are met at all times, water quality modeling is done under "worst case" conditions of low river flows, when in-stream dilution is low, and high water temperatures, when DO saturation is low and BOD decay and SOD are high. See June 2002 Androscoggin River Modeling Report and Alternative Analysis, page 52.

<sup>14</sup> See May 2005 Androscoggin River Total Maximum Daily Load (TMDL) Report, Figures 14 and 15 (pages 38-39).

<sup>15</sup> Ibid, Figures 17 and 19, pages 41 and 43.

<sup>16</sup> This is discussed more fully in the Board's order of this date on the related appeal of the water quality certification for FPLE's Gulf Island-Deer Rips Hydro Project.

<sup>17</sup> In imposing this requirement, the Department assumed that RPC would continue to be responsible for 38% of the oxygen injected at Upper Narrows under the terms of the existing GIPOP Partnership Agreement.

would only be responsible to pay for 39,900 pounds per day of 105,000 pounds per day of oxygen injection from the existing GIPOP facility but would not be responsible to contribute anything from the additional oxygen injection facility. However, this is clearly an insufficient amount of oxygen to fully compensate for the impact of RPC's discharges, at the limits set in the September 21, 2005 permit and under worst case conditions, on dissolved oxygen levels in Gulf Island Pond.<sup>18</sup> RPC has not presented any persuasive evidence to the contrary. RPC simply cannot credibly argue, on the one hand, that the TMDL and its underlying model should be used to set permit requirements, and on the other hand, argue that the oxygen injection allocations determined on the basis of the TMDL and the underlying model should be ignored.<sup>19</sup>

c. Other Issues on Appeal

The Board finds that RPC has not raised any other issues on appeal that require a response.

10. DISCUSSION OF FPLE APPEAL

Appellant FPLE argues that RPC and the other point sources discharging into Gulf Island Pond are responsible for bearing the burden of any additional oxygen injection.

As more fully discussed in the Board's order of this date on the related appeal of the water quality certification for FPLE's Gulf Island-Deer Rips Hydro Project, Appellant FPLE has not presented persuasive evidence calling into question the Department's determinations that Gulf Island Dam causes or contributes to the violation of dissolved oxygen standards in Gulf Island Pond, and that FPLE should be responsible for injecting oxygen or taking other equivalent measures to mitigate the impact of Gulf Island Dam on dissolved oxygen levels in Gulf Island Pond. Furthermore, Appellant FPLE has not presented persuasive evidence calling into question the Department's methodology for determining FPLE's level of responsibility for mitigating the impact of Gulf Island Dam on dissolved oxygen levels in Gulf Island Pond.

The evidence in the record indicates that, in order to address water quality problems in Gulf Island Pond, the Department developed a model to predict water quality in the pond under different pollutant loading and oxygen injection conditions. The Department then ran the model with upstream point source discharges set at zero. The model predicted that, absent any oxygen injection, and under summer low flow and high water temperature conditions, there would be significant non-attainment of minimum Class C dissolved oxygen standards

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<sup>18</sup> See pages 48-51 of Fact Sheet prepared for and accompanying the September 21, 2005 permit for the calculation of RPC's oxygen injection requirement. The August 7, 2006 permit modification changes the compliance schedules contained in the September 21, 2005 permit but did not change the final effluent limits or oxygen injection requirements of the 2005 permit.

<sup>19</sup> The Board also notes that RPC can, at any time, request that its permit be modified to reduce its effluent limits and thus reduce, and possibly eliminate, its additional oxygen injection requirements.

in Gulf Island Pond below depths of 20 feet.<sup>20</sup> The Department next made iterative runs of the model while providing increased amounts of oxygen injection into the pond. The model predicted that the injection of 105,000 pounds per day of oxygen at Upper Narrows (the location of the current GIPOP facility, about 5 miles upstream from Gulf Island Dam), or the injection of 65,000 pounds per day of oxygen at Lower Narrows (about 3 miles upstream from the dam), at an existing oxygen efficiency transfer rate of 33%, would be needed to meet dissolved oxygen standards.<sup>21</sup> In its September 21, 2005 water quality certification, the Department imposed a condition requiring that FPLE inject an amount of oxygen at Upper Narrows and Lower Narrows, or take other equivalent measures, sufficient to meet dissolved oxygen standards under critical conditions and in the absence of point source discharges.<sup>22</sup>

At its core, FPLE's argument is that it should not be responsible for anything more than is required of it under the existing GIPOP Partnership Agreement, which amounts to 14% of annual GIPOP operating and maintenance costs. Thus, under that agreement, FPLE would only be responsible to pay for 14,700 pounds per day of 105,000 pounds per day of oxygen injection from the existing GIPOP facility. However, this is clearly an insufficient amount of oxygen to meet dissolved oxygen standards in Gulf Island Pond in the absence of point source discharges. As stated in the Department's Total Maximum Daily Load (TMDL):<sup>23</sup> "The amount of dissolved oxygen non-attainment predicted by the model with point sources at zero discharge can be considered to be the impact related to the dam."<sup>24</sup> FPLE has not presented any persuasive evidence to the contrary. Therefore, the Board is persuaded that FPLE is only being held accountable for its fair share of the non-attainment problem; the same is true of RPC.

## 11. DISCUSSION OF CLF, et al. APPEAL

Appellant CLF, et al. argues that any compliance schedules for final effluent limitations and for additional oxygen injection are illegal as a matter of state and federal law. Alternatively, CLF, et al. argues that, if legal, any compliance schedules must be as short as possible and must include interim enforceable requirements. CLF, et al. further argues that a compliance schedule may not exceed the term of a permit. As discussed below, the Board rejects CLF, et al.'s arguments that compliance schedules are impermissible in the context of this waste discharge permit, but agrees that compliance schedules should be as short as possible.

Both state law, at 38 M.R.S.A. Section 414-A(2), and the federal Clean Water Act, at Section 301(b), authorize the use of compliance schedules in the issuance of permits. However, state

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<sup>20</sup> See May 2005 Androscoggin River Total Maximum Daily Load (TMDL) Report, Figures 22 and 23 (pages 47-48).

<sup>21</sup> Ibid, Figures 24-27, pages 48-52.

<sup>22</sup> In its condition, the Department assumed that FPLE would continue to be responsible for 14% of the oxygen injected at Upper Narrows under the terms of the existing GIPOP Partnership Agreement.

<sup>23</sup> A TMDL establishes the allowable pollutant loadings or other quantifiable parameters for a waterbody and thereby provides the basis for the establishment of effluent discharge limits and other controls necessary for that waterbody to meet water quality standards. See "Guidance for Water Quality-based Decisions: The TMDL Process," EPA 440/4-91-000 (April, 1991).

<sup>24</sup> 2005 TMDL, page 28.

law specifies that compliance schedules can only be used for “a final effluent limitation based on a water quality standard adopted after July 1, 1977,” and that such schedules “must be as short as possible, based on consideration of the technological, economic and environmental impact of the steps necessary to attain those standards.”<sup>25</sup>

In its September 21, 2005 permit for the Rumford mill, the Department approved compliance schedules for final effluent limits for summertime TSS, total phosphorus and ortho-phosphorus, as well as a compliance schedule for additional oxygen injection. However, in its August 7, 2006 permit modification for the Rumford mill, the Department eliminated the summertime TSS compliance schedule in its entirety. Thus, this portion of CLF, et al.’s appeal is now moot.

With respect to compliance schedules for final effluent limits for total phosphorus and ortho-phosphorus, the Department made the following findings in its September 21, 2005 decision:

“The permit also sets new limits for phosphorus base[d] on new information. Phosphorus limits are important for two related reasons. First, phosphorus is a critical factor in promoting excess growth of algae, and these growths can cause objectionable blooms that impair uses such as swimming. The designated use of swimming in Class C waters was added after 1977. Historically, the transmission of sunlight through the water column was hindered by highly colored water, thus preventing the growth of algae, notwithstanding available phosphorus concentrations. Legislation requiring color reductions in pulp mill discharges was enacted in 1989 and the resulting reduced color in the river allowed the growth of objectionable levels of algae that periodically impair swimming as a designated use. From information in the TMDL, the Department has determined that algae blooms may occur when the chlorophyll-a concentration exceeds 10 ppb. Second, as algae dies, it can sink to the bottom and decay, causing the depletion of oxygen at a later time as part of the sediment oxygen demand. Through the TMDL, the contribution of algae to SOD is now better understood. As discussed above, additional growth of algae due to reduced color has added to the SOD load. This has contributed to non-attainment of dissolved oxygen levels for protection of salmonid fish first proposed by EPA in 1986. This constitutes a new interpretation of the narrative standard.”<sup>26</sup>

The Board agrees with the Department’s findings and concludes that compliance schedules may be utilized here for final phosphorus discharge limits.

With respect to oxygen injection, it takes time to fund, design, and construct an oxygen injection system. Given this, and given the fact that revisions to the water quality model used by the Department may reduce the amount of additional oxygen injection needed to meet water quality standards in Gulf Island Pond, a compliance schedule for additional oxygen injection is both necessary and appropriate. The Board finds that it is not realistic to mandate

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<sup>25</sup> 38 M.R.S.A. Section 414-A(2).

<sup>26</sup> See page 64 of the Fact Sheet prepared for and accompanying the September 21, 2005 permit.

immediate compliance with an additional oxygen injection requirement when such a requirement cannot possibly be met. The Board further finds that it is not appropriate to require that an expensive oxygen injection system be built now when the need for and size of the system may change significantly.

Finally, in recognition of the uncertainties inherent in any model and especially in complex situations such as exist in Gulf Island Pond, EPA guidance and the EPA approved TMDL clearly embrace the concept of phased implementation,<sup>27</sup> in which reductions in pollutant loadings and other water quality improvement measures are “phased in” over time in a step-wise fashion while on-going monitoring is used to evaluate the effectiveness of the measures taken before further actions are implemented, as envisioned in the Department’s TMDL.<sup>28</sup> Schedules of compliance are inherent in the concept of phased implementation.

The Board finds that Appellant CLF, et al. has not presented persuasive evidence calling into question the Department’s determination that the use of compliance schedules in the waste discharge permit for the Rumford mill for total phosphorus, ortho-phosphorus and additional oxygen injection is appropriate and necessary. The Board agrees with the Department that a new interpretation of a narrative standard, deriving a more stringent water-quality-based numeric standard for a particular facility, essentially results in a newly adopted standard for which the use of a compliance schedule is authorized by law.<sup>29</sup>

However, the Board is sensitive to the fact that it is time to bring Gulf Island Pond into compliance with water quality standards. The question, therefore, is whether the compliance schedules for final effluent limits imposed by the permit are “as short as possible.”

In its August 7, 2006 modification of the permit for the Rumford mill, and taking into consideration historic effluent data and the technological, economic and environmental impact of the steps necessary to attain the more stringent water-quality-based numeric standards for the discharge of phosphorus from the Rumford mill imposed by the September 21, 2005 permit, the Department established shorter compliance schedules for final effluent limits for total phosphorus and ortho-phosphorus, with compliance due by 2008 instead of by 2010.<sup>30</sup> For similar reasons, the Department also established interim effluent limits for total phosphorus and ortho-phosphorous, effective upon issuance of the permit modification.

The Board is persuaded by the evidence that the shortened compliance schedules for interim and final effluent limits for phosphorus are both achievable and as short as possible. In

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<sup>27</sup> See “Guidance for Water Quality-based Decisions: The TMDL Process,” EPA 440/4-91-000 (April, 1991).

<sup>28</sup> “There is some uncertainty in water quality modeling and the assignment of various parameter rates. In addition, there is uncertainty involved in the determination of the water quality target of chlorophyll-a levels used to describe the threshold level of an algae bloom that are specific to Gulf Island Pond...For this reason, it is recommended that the TMDL be implemented in phases of two or three step reductions with required ambient monitoring for point sources in cooperation with MDEP.” May 2005 TMDL, pages 6-7. In its July 18, 2005 notification of approval of the Department’s TMDL, EPA stated: “EPA recognizes that where immediate compliance is not possible, phased implementation is a reasonable approach.” (page 19)

<sup>29</sup> See page 63 of Fact Sheet prepared for and accompanying the September 21, 2005 permit.

<sup>30</sup> See pages 7-10 of Fact Sheet prepared for and accompanying the August 7, 2006 permit modification.

particular, the Board relies on CLF, et al. Exhibit CFL-CC that charts RPC's actual discharge levels for the past several years in comparison to the discharge limits established in the September 21, 2005 permit and the May 11, 2006 modification. This exhibit indicates that RPC has demonstrated its ability, with limited exceptions, to comply with the new limits. Therefore, the Board concurs with the shortened compliance schedules for phosphorus approved by the Department. These shortened schedules will bring the Rumford mill into compliance with all final effluent limits within the 5-year term of the current permit.

Finally, the Board is persuaded by the evidence in the record that the efficiency of the existing 20-year-old oxygenation system in transferring oxygen into Gulf Island Pond, and thus increasing dissolved oxygen levels in the pond, could be greatly improved by upgrading the system. In particular, RPC witness Mark Mobley testified that dissolved oxygen enhancement systems are routinely used at hydropower facilities to improve water quality, and that the oxygen transfer efficiency of the existing system in Gulf Island Pond could be significantly improved in a cost-effective manner. [see pre-filed direct testimony of RPC witness Mark Mobley, and Mr. Mobley's hearing testimony at Transcript pages 1494-1497, 1658-1663]. This is expected to cost less than any additional oxygen injection system and should be able to be funded, designed and installed in less time than an additional system. Given this, and in keeping with the phased implementation approach recommended in the TMDL, it is appropriate to require upgrades to the existing oxygenation system now while providing a compliance schedule that delays installation of an additional oxygen injection system until further monitoring has been undertaken to determine the benefit to dissolved oxygen levels from these upgrades.

## 12. COMPLIANCE MONITORING

The Board is persuaded by the evidence that accurately determining the point of thermal stratification is critical to the determination of future non-attainment of dissolved oxygen standards in Gulf Island Pond. [see pre-filed direct testimony of FPLE witness F. Allen Wiley at Tab 3, and pre-filed direct testimony of Verso witness John Connolly]. In addition, RPC argues that its monitoring requirements are too broad.

The Board notes that, in a letter to the principals of the GIPOP Partnership dated January 23, 2007, the Department stated that, in order to satisfy the requirements of state law,<sup>31</sup> it considers the point of thermal stratification in Gulf Island Pond to be the bottom of the first meter segment in the thermal profiling data where the temperature gradient is one degree Celsius or greater per meter. The Department further stated that it will only be able to determine this point when it has access to thermal profiling data in one meter increments, instead of in 5-foot increments as currently collected in Gulf Island Pond by the GIPOP Partnership.

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<sup>31</sup> 38 M.R.S.A. Section 464(13), enacted as Public Law 2003, Chapter 257. This law specifies that compliance with dissolved oxygen standards in riverine impoundment such as Gulf Island Pond is not measured below the point of thermal stratification when such stratification occurs.

The Board is persuaded by the evidence in the record that additional water quality monitoring data is needed in order to more accurately determine compliance with Class C dissolved oxygen standards in Gulf Island Pond, as defined by law.

BASED on the above Findings of Fact as well as the Findings of Fact in the Department's Orders of September 21, 2005 and August 7, 2006 which the Board adopts as its own, except as otherwise discussed above, the Board concludes that:

1. The appellants are aggrieved and have filed timely appeals.
2. Appellant RPC has not presented persuasive evidence that would support overturning or modifying the Department's September 21, 2005 permit for the Rumford pulp and paper mill, insofar as this decision imposes additional oxygen injection requirements.

However, the Board concludes that the water quality model used by the Department miscalculates the area of sediment in contact with various segments of Gulf Island Pond and that, as a consequence, the Department's Total Maximum Daily Load (TMDL) Report may overstate the amount of point source phosphorus reductions needed to meet water quality standards in the pond. Additionally, the Board concludes that the Department's model was not re-calibrated following the correction of an error relating to dispersive mixing and that, as a consequence, the Department's TMDL Report may overstate the amount of additional oxygen injection needed to meet water quality standards in Gulf Island Pond.

The Board also concludes that the development and use of a hydrodynamic model to determine mixing and transport within Gulf Island Pond may more accurately predict water quality conditions than does the Department's current model, and may result in changes in the effluent limits and additional oxygen injection needed to meet water quality standards in the pond.

Finally, the Board concludes that additional water quality monitoring is needed to more accurately determine compliance with dissolved oxygen standards in Gulf Island Pond.

3. Appellant FPLE has not presented persuasive evidence that would support overturning or modifying the Department's September 21, 2005 permit for the Rumford pulp and paper mill, insofar as this decision does not hold RPC and other point source discharges responsible for all additional oxygen injection requirements. However, as discussed above, the Board concludes that the water quality model used by the Department was not re-calibrated following the correction of an error relating to dispersive mixing and that, as a consequence, the Department's TMDL Report may overstate the amount of additional oxygen injection needed to meet water quality standards in Gulf Island Pond.
4. Appellant CLF, et al has not submitted persuasive evidence that would support overturning or modifying the Department's September 21, 2005 permit and August 7, 2006 permit modification for the Rumford pulp and paper mill, insofar as these decisions approve

compliance schedules for final effluent limitations for phosphorus and for additional oxygen injection.

However, the Board concludes that upgrading the existing oxygen injection system to increase dissolved oxygen levels in Gulf Island Pond is economically and technically feasible and is an appropriate measure to improve water quality in the pond in the near-term.

THEREFORE, the Board PARTIALLY GRANTS the appeals of (a) RUMFORD PAPER COMPANY, (b) FPL ENERGY MAINE HYDRO LLC, and (c) CONSERVATION LAW FOUNDATION, MAINE RIVERS, ANDROSCOGGIN RIVER ALLIANCE, and ANDROSCOGGIN LAKE IMPROVEMENT ASSOCIATION and MODIFIES Department Order #W000955-5N-G-R and #ME0002054 dated September 21, 2005, as modified by Department Order #W000955-5N-H-M and #ME0002054 dated August 7, 2006, approving a combined waste discharge license and Maine Pollutant Discharge Elimination System permit for the discharge of treated wastewater from a kraft pulp and paper mill in Rumford, Maine, as follows:

1. Special Condition K(b) (“GULF ISLAND POND OXYGENATION INJECTION OPERATION”) is modified to read:
  - a. The permittee shall, independently or in cooperation with FPL Energy Maine Hydro LLC, Verso Paper and Fraser Paper, or their successors-in-interest, operate an upgraded oxygen injection system at Upper Narrows and an additional oxygen injection system at Lower Narrows in Gulf Island Pond, according to a plan approved by the Department.
  - b. By June 1, 2008, the permittee shall, independently or in cooperation with FPL Energy Maine Hydro LLC, Verso Paper and Fraser Paper, or their successors-in-interest, submit a plan and schedule for upgrading the existing Gulf Island Pond oxygen injection system to increase the oxygen transfer efficiency of the system and thereby increase dissolved oxygen levels in the pond. The upgraded oxygen injection system shall be operational no later than June 1, 2009. The plan and schedule shall be reviewed by and must receive the approval of the Department.
  - c. By June 1, 2009, the permittee shall, independently or in cooperation with FPL Energy Maine Hydro LLC, Verso Paper and Fraser Paper, or their successors-in-interest, submit a plan and schedule for injecting sufficient oxygen into Gulf Island Pond to mitigate the impact of the permittee’s wastewater discharge on dissolved oxygen levels in the pond. The plan shall provide that, beginning no later than June 1, 2010, the permittee shall inject oxygen at the rate of up to 55,360 pounds per day at Upper Narrows in Gulf Island Pond, or equivalent rates at higher transfer efficiencies and/or other locations, or take other equivalent measures as may be approved by the Department. The plan and schedule for injecting oxygen into Gulf Island Pond shall be reviewed by and must receive the approval of the Department. The oxygen injection limitations set forth in

Special Condition A of Department Order #W000955-5N-G-R dated September 21, 2005 are modified to be consistent with this paragraph.

After re-calibration of the water quality model for Gulf Island Pond following the correction of an error relating to dispersive mixing, as well as any other future modifications to the model and revisions to the Department's May 2005 Androscoggin River Total Daily Maximum Load (TMDL) Report, and after notice to the permittee and opportunity for hearing, the Department reserves the right to re-open and modify the terms of this permit to change the rates of oxygen injection specified above.

- d. The permittee shall be responsible for taking such actions as are needed to meet Class C dissolved oxygen standards in Gulf Island Pond, insofar as the permittee's wastewater discharge causes or contributes to a violation of these standards. After reviewing the results of monitoring following the implementation of all additional oxygen injection or other equivalent measures and all reductions in point source discharges required pursuant to the Department's May 2005 Androscoggin River Total Daily Maximum Load (TMDL) Report and any future revisions thereto, and after notice to the applicant and opportunity for hearing, the Department reserves the right to reopen and modify the terms of this Order to require reduced effluent limitations and/or reasonable changes in oxygen injection system(s) and/or oxygen injection rates, or changes in other equivalent measures, as may be deemed necessary to ensure that permittee's wastewater discharge, either by itself or in combination with other discharges, does not cause or contribute to the violation of Class C water quality standards in Gulf Island Pond.

2. Special Condition O ("AMBIENT WATER QUALITY MONITORING") is modified to read:

By March 1, 2008, the permittee shall, independently or in cooperation with FPL Energy Maine Hydro LLC, Verso Paper and Fraser Paper, or their successors-in-interest, submit a plan for conducting ambient water quality monitoring to determine compliance with Class C dissolved oxygen standards in Gulf Island Pond under current and future conditions. This monitoring shall provide sufficient data to determine the point of thermal stratification in the pond and shall begin no later than June 1, 2008. This plan shall be reviewed by and must receive the approval of the Department.

3. Special Condition R ("REOPENING OF PERMIT FOR MODIFICATION") is modified to add the following paragraph:

After revision of the water quality model for Gulf Island Pond to recalculate the area of sediment in contact with the pond, as well as any other future modifications to the model and revisions to the Department's May 2005 Androscoggin River Total Maximum Daily Load (TMDL) Report, and after notice to the permittee and opportunity for hearing, the Department reserves the right to re-open and modify the terms of this permit to change the final effluent limitations for total phosphorus and/or ortho-phosphorus specified in this permit.

4. Special Condition T is added to read:

HYDRO-DYNAMIC MODELING

By March 1, 2008, the permittee may, independently or in cooperation with other parties, provide sufficient funding to the Department for the development and use of a hydro-dynamic model to determine mixing and transport within Gulf Island Pond. This model shall be developed by the Department or by a third-party under contract to the Department and must be supported by the Environmental Protection Agency. A final modeling report must be provided to the permittee and other interested parties no later than November 1, 2009. After reviewing the report on the results of any hydro-dynamic model developed for Gulf Island Pond, and after notice to the permittee and opportunity for public hearing, the Department reserves the right to re-open and modify the terms of this permit to require changes in final effluent limitations and/or changes in oxygen injection system(s) and/or oxygen injection rates, or changes in other equivalent measures, as may be deemed necessary to ensure that permittee's wastewater discharge, either by itself or in combination with other discharges, does not cause or contribute to the violation of Class C water quality standards in Gulf Island Pond.

FINALLY, the findings, conclusions and conditions of Department Order #W000955-5N-G-R and #ME0002054, dated September 21, 2005, as modified by Department Order #W000955-5N-H-M and #ME0002054 dated August 7, 2006, are adopted by the Board and incorporated herein, except as otherwise modified above.

DONE AND DATED AT AUGUSTA, MAINE, THIS 7<sup>th</sup> DAY OF February, 2008.

BOARD OF ENVIRONMENTAL PROTECTION

BY: /s/ Virginia Plummer  
VIRGINIA PLUMMER, Chair