



HARPETH RIVER WATERSHED ASSOCIATION

December 1, 2009

Mr. Gary Davis
Tennessee Department of Environment and Conservation
Division of Water Pollution Control
6th Floor, L&C Annex
401 Church Street
Nashville, Tennessee 37243

Re: Draft NPDES permits:
Franklin STP, TN0028827; Lynwood Utilities STP, TN0029718;
Cartwright Creek LLC – Grassland STP, TN0027278

Dear Mr. Davis,

Thank you for accommodating our request in October to extend the comment period until December 1 to enable us to compile our materials and analyses to provide to the department on these proposed permits. Please incorporate all of the attachments provided with this summary into our comments for the record. Also, HRWA signs onto the comments provided by the Tennessee Clean Water Network as they have signed onto ours in order to provide the department with comprehensive input without duplicating effort. TCWN has included review of the three permits by Dr. Joann Burkholder, an aquatic ecologist, who is the director of the Center for Applied Aquatic Ecology at NC State University. HRWA has included an analysis and calculations of the pollution load the river can handle based on the TMDL principles and current field conditions from Mike Corn, President of Aquaeter, an environmental engineering firm with extensive experience in TMDLs and water quality.

In addition to these comments I would like to reiterate our request for a joint public hearing on the three proposed permits. Having worked with the department on prior permit renewals (Lynwood and Franklin) and the ARAP permit for a withdrawal regime for Franklin's drinking water plant, I would like to suggest that the joint public hearing be set in January after the public hearings on the triennial review of the water quality standards. In consideration of the holiday season as well, setting a public hearing for late January will enable more public attendance to learn and provide input.

These three sewage treatment plants (STP) discharge directly into the Harpeth River within a 17 mile stretch of one another in the upper third of the watershed. The receiving waters are impaired as a result of low dissolved oxygen levels, nutrients and

phosphates according to TDEC's 2008 303(d) list. Franklin's STP, with a design flow of 12 MGD (million gallons a day), is the largest point source discharger in the entire 872 square mile watershed, and is classified as a major discharger. At this time, the facility is operating at about half that capacity. The other two STPs, though significantly smaller as minor dischargers, are not far downstream. The EPA completed a TMDL for Nutrient Enrichment/Low Dissolved Oxygen in 2004 that applied to the Harpeth from the headwaters down to the mainstem's confluence with the Little Harpeth at the Williamson County line.

Violations of the state's dissolved oxygen standard in the Harpeth occur during the summer when the river naturally has its low flow summer season. Data gathered by the EPA, TDEC, HRWA, and consultants in studies related to various permit issues on the Harpeth have documented low dissolved oxygen levels as far downstream as the Harpeth River State Park in Cheatham County. The Harpeth River is listed on the 303(d) for low dissolved oxygen all the way downstream to the confluence with the South Harpeth in Cheatham County. These violations are occurring in two Tier II sections of the Harpeth River: the state scenic river section in Davidson County, and the adjacent downstream section in Cheatham County adjacent to the number properties that comprise the Harpeth River State Park. The attachments include four different dissolved oxygen studies of the Harpeth River that HRWA has conducted since 2002 with various partners and supporters. The two most extensive in 2006 and 2007 were coordinated with TDEC field staff with the study in 2007 funded in part by the TN Wildlife Resources Agency.

A number of analyses have been done that have built on and relooked at key aspects of the EPA's TMDL (Attachments 6 and 7). In addition to the mainstem's dissolved oxygen studies, HRWA has funded analyses, completed an EPA grant with Franklin and Williamson County as partners, and received several state 319 stream restoration grant that have encompassed the following: watershed plans and stream restoration in the headwaters, bacterial surveys and efforts toward addressing failing septic in the headwaters, characterized the effluent domination of the river's flow in the summer downstream from Franklin, amount of industrial chemical oxygen demand just upstream from Franklin's discharge from contaminated groundwater seepage from Egyptian Lacquer, the effect on the river's assimilative capacity from water withdrawals, and the use of site level stormwater runoff tools to reduce stormwater runoff contributions from development.

A key finding from several years of summer dissolved oxygen monitoring is that the Harpeth River does not meet the state water quality D.O. standard upstream from the first permitted sewage treatment plant. Data gathered measured times when the river was below state standards upstream of each of these permitted discharge points. Based on analysis funded by HRWA, at times when the river's dissolved oxygen levels were significantly below standards, the river's flow below Franklin was 50% or more of treated effluent that was then added to by the two downstream STP dischargers. Dissolved oxygen levels slowly increased and were above or close to the state standard in the Harpeth over 30 miles downstream from the Cartwright Creek outfall in Cheatham County where the river's flow was ten times or more what it is through the Franklin and

northern Williamson County area. (See attachment 8 for a short summary or the actual reports in attachments 2-7).

Thus, the Harpeth River in the summer season is violating water quality standards for dissolved oxygen when the city of Franklin's plant is discharging at less than half of its permitted design capacity with a very highly treated effluent that is well within the permit limits. From a review of Franklin's DMRs, the plant's effluent is consistently at a BOD₅ of 2 mg/l or less. The proposed permit limit for BOD₅ in the renewal is 4 mg/l which is based on the TMDL. At Franklin's design flow of 12 MGD, this is significantly MORE pounds of oxygen demand than the city currently discharges and the river does not currently meet the state water quality standards under these current conditions. This is the same for the other two permits. These field data findings essentially point to issues with key assumptions in the TMDL, and that it is time for investment in a new TMDL model. (Attachment 6-7).

Field data and analysis provided with these and TCWN's comments all indicate that the Harpeth River is not meeting water quality standards, especially dissolved oxygen, because of effluent discharges from these facilities. The Harpeth river's flow in the summer is so low that permitted effluent discharges can easily make up a significant percent of the river's flow (specific estimates provided in attachments 6-7). To quote Dr. Burkholder in her comments, the Franklin STP with a design flow of 12 MGD "can 'swamp' the natural flow of the stream (low flow 7Q10 is only 0.49 MGD)." Though Franklin's design flow is the largest, because of the river's summer low-flow conditions, both the much smaller Lynwood and Cartwright Creek sewer plants also contribute enough pollutant load to continue to reduce oxygen levels and add nutrients that feed algal growth in the river. Lynwood at 0.4 MGD contributes about 14% of the river's flow when the Harpeth is at low flow, 7Q10 conditions of 2.77 MGD. Cartwright Creek, though the smallest at 0.25 MGD, has such significant inflow/infiltration problems with its collection system, that its effluent flow is nearly double that. So, even this small sewer plant when compared to the large upstream Franklin facility still contributes around 10% to the river's flow during 7Q10, low-flow conditions (2.86 MGD in the river).

As Dr. Burkholder states for the Lynwood and Cartwright Creek permits, "discharge from the STP under its new permit will continue to contribute substantially to the nutrient/eutrophication-related impairment for the receiving segment of this 303(d) listed stream." She states the same thing for Franklin's permit: "discharge will continue to significantly influence" the Harpeth.

The analysis provided in the attachment to our comments from Aquaeter (attachment 1) come to the same conclusion based on TMDL pollutant load calculations for oxygen demand. Using the TMDL equation that requires a margin of safety, incorporating pollutant loading from nonpoint sources, and using the specific data derived from the EPA in its TMDL, the amount of pollutant load the Harpeth can assimilate at the point of Franklin's outfall is 130 lbs/day of BOD (biological oxygen demand.) EPA's TMDL in comparison is three times higher at 400 lbs/day. Aquaeter's

work incorporates existing conditions in the Harpeth, whereas the EPA's TMDL made a significant assumption that the river in the summer would be above state standard of 5 mg/l. (The TMDL used 6 mg/l). With existing conditions, that include a 300 lb/day pollutant load from the Egyptian Lacquer chemical input from contaminated groundwater, 130 lbs/day is all there is in the Harpeth for the existing three sewer plants. This is significantly less than the proposed permits would allow and the current permits already allow.

Based on the field data and analyses summarized above, the draft permits appear to violate the Clean Water Act and the TN Water Quality Control Act by not setting permit limits so that water quality standards are met in the receiving stream which is the Harpeth (see citations in TCWN comments). In addition, permits cannot be authorized when "conditions of the permit do not provide for compliance with the applicable requirements of the CWA or regulations promulgated under CWA" (40 CFR Part D section 122.4 (a) and (d) and TWQCA 1200-4-5-.04(f)).

HRWA applauds the department in working on a watershed basis in these permit renewals. For the Harpeth river, this is the first time the 3 sewage treatment plants in Williamson County, which include the largest point source discharge in the river system, will have their permits synchronized for renewal. This enables TDEC for the first time to have all the permit holders, sister agencies, private sector experts, non-profit organizations, and the public focusing on establishing a solution and/or a process for finding a solution that the permits can drive that will result in the Harpeth meeting the state dissolved oxygen water quality standard in the near future.

A key to this will be Franklin's work on its new Integrated Water Resources Plan (IWRP) which will be integrating stormwater runoff, effluent discharge, effluent reuse, and water withdrawal for drinking water. The city of Franklin has also set goals in its sustainability plan for a reduction in the flow of treated effluent into the Harpeth during the summer low flow season. Williamson County has taken a lead role in addressing failing septic systems in neighborhoods around Lynwood STP. Both this sewer plant and Franklin will be receiving the sewage from over 400 currently septic served homes that will reduce the nutrient enrichment into Lynwood Creek that is also listed on the 303(d) list.

Comments Applicable to all three proposed permits:

1. Based on current conditions in the Harpeth, less effluent discharge in volume and in concentration of pollutants needs to be instituted for the low-flow summer season than what current permitted and is in the proposed new permits. A waste load allocation and TMDL needs to be redone for the Harpeth. This can be put in motion as part of Franklin's insightful IWRP initiative. Also, Franklin should not shoulder all the work and cost for developing a WLA for the Harpeth all by itself both in terms of analysis and monitoring. Though, clearly Franklin will take the lead and will likely become the regional sewer system since it has a highly functioning STP that

can meet tight effluent limits cost effectively and has already put integrated water management schemes into play, such as effluent reuse.

2. Aquaeter's comments offer an interim WLA for which to finalize the proposed permits for their short term period to the end of November 2011 that would apply for the summer, low-flow season. Establishing a waste load for the Harpeth in the vicinity of the discharges forms the foundation of a watershed based permit. Franklin can currently meet a 130 lbs/day load allocation in the summer since its effluent CBOD5 is very clean at just under 2 mg/l. At a 6 MGD flow, which is what the facility currently produces, and its current BOD5, the Franklin STP could meet this pollutant load. But, it would mean no discharge in the summer for Lynwood and Cartwright Creek (which wasn't even factored into the EPA TMDL.) Franklin in the summer season has been sending 3 -4 MGD of its effluent to irrigation reuse which does not get discharged into the Harpeth. With Franklin's effluent reuse that is already in place, there is some pollutant load that can be allocated to the two other sewer plants in the summer for the short term duration of these permits.
3. Along the same lines of moving to watershed based permitting, all 3 proposed permits need the same effluent concentrations. For example, the proposed permits right now have Franklin with a tighter BOD5 than the other two, and Lynwood with the tightest TN. All 3 have different proposed TP effluent limits too.
4. The Harpeth River segments that all 3 STPs discharge into does not meet water quality standards in the summer predominantly because of effluent discharge. Each permit at the beginning of the rationale section instead says the "division considers these conditions to be due primarily to non-point discharges rather than the permittee's treated wastewater discharge." The field data and analyses presented in these comments and the EPA's TMDL refutes this. The rationale statement needs to be edited to state that conditions in these segments of the river are due to the permittee's treated wastewater discharge as well as to non-point discharges.
5. Each permit needs language that is similar to what is found in other TDEC permits, such as the construction general permit: "This permit does not authorize discharges that would result in violation of a state water quality standard."
6. Each proposed permit dropped the TMDL reopener clause. Is there other language that accomplishes the same intent? If not, we suggest it be put back in these permits.
7. TDEC should test each facility's effluent quarterly as an independent duplicate sample when the permittee does it. The permittee can pay for this cost. This test would be used to derive the CBODu/BOD5 ratio.
8. The permits should establish a goal or two for the Integrated Water Management Plan that Franklin has begun so that the effort which is intended to improve water quality in the Harpeth produces analysis relevant for all 3 permittees. One goal would be to establish a waster load allocation for the Harpeth. Another goal needs to be to require

that Lynwood and Cartwright Creek participate and bring some funding to the effort. (See item #9 and #10 below).

Lynwood and Cartwright Creek permits:

9. The permits for Lynwood and Cartwright Creek need to require their participation and some funding that they bring to Franklin's IWRP process so that all the permittees are involved. The possible scenarios for an implementation plan for a TMDL on the Harpeth for low dissolved oxygen will need to involve all 3 sewer plants. The 3 sewer plant utilities, the city of Franklin and Williamson County have all had discussions already as the northern Williamson County area looks at regional sewer solutions.
10. Both permits need to also require the similar receiving stream investigations that are in Franklin's proposed permit. This might be the best way to essentially have all 3 permittees involved in the IWRP and combining resources for collecting water quality data that is needed to develop a new waste load allocation/new TMDL for the Harpeth for low dissolved oxygen and nutrient enrichment.
11. Lynwood's reserve sewer capacity was a significant step by TDEC when the facility was approved for expansion to address adjacent neighborhoods with failing septic systems. Williamson County leadership has spent considerable effort to now have the sewer hook systems underway. Some of the neighborhoods will actually now be served by Franklin. This is a major step toward regional sewer integration in this area. But, it is critical to keep this reserve capacity in place. Prior analysis provided by HRWA to the department two years ago when the utility wanted to accept almost 430 new homes found that it would be hard for Lynwood to meet its current permit limits as it comes closer to its design capacity as these septic homes are hooked up. We recommend keeping the reserve in place, regardless of the status of the septic hook-up program, since at Lynwood's current operation the river is not meeting standards in the summer.
12. The neighborhood in which Lynwood is located has complained again about odor. What can the department do with regard to the proposed permit to address this problem? The Cottonwood development layout that this facility was originally built for did not provide much in the way of buffering space for the facility.
13. Cartwright Creek has a significant I/I problem that the department recognizes in the draft permit (page R2). This significant increase in rain and groundwater into the facility is compromising the treatment according to the draft permit. The proposed permit does not have specifics as to how the utility will address this which needs to be done. This issue should be part of the IWRP so that these costs are incorporated in alternatives analysis that the project will be developing.

This permit renewal is really the beginning of developing a comprehensive plan for the mainstem of the Harpeth River so that it meets water quality standards during the summer low flow season. HRWA has been playing a significant role in collaborating with various state and federal agencies, working with the sewage treatment plant permittees, and bringing in private outside TMDL experts to help contribute to creating the framework for a cost effective plan for sewage management for the large growth area of the Harpeth River watershed so that the Harpeth will meet water quality standards as soon as possible. HRWA is looking forward to being a member of the stakeholder group of the IWRP that has its first meeting December 17.

HRWA would like to convene a gathering of all the permit holders, their consultants, other agency experts, TDEC, and any other interested parties to host a presentation and discussion of all the dissolved oxygen data. HRWA will offer this as part of the something we can bring to the IWRP effort. Please do not hesitate to contact me with any questions on these comments and I look forward to working with all the stakeholders.

Sincerely,



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Cc: Paul Sloan, Deputy Director, TDEC
Paul Davis, Director, Water Pollution Control, TDEC
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Mark Hilty, City of Franklin director of Water and Sewer
Tyler Ring, president, Lynwood Utility District
Bruce Myers, regional manager, Cartwright Creek LLC
Dave McKinney and staff, TWRA
Steve Alexander, US Fish and Wildlife Service, Cookeville
Rogers Anderson, Williamson County mayor
John Schroer, city of Franklin mayor
Bill Melville, EPA
Tom McGill, EPA
Mark Nuhfer, EPA

Attachments:

Below is a list of the attachments and a brief description of their relevance. Some are on the HRWA web site (under Library/Scientific Studies), so their location is supplied so they can be printed out for the file. Most of these documents you and others in the department have received already. I will mail you a printed set as well. Please contact HRWA for copies of any of these attachments.

1. Comments on the Harpeth River Watershed NDPES Permits, by Aquaeter to Harpeth River Watershed Association, Nov. 25, 2009

This memo includes calculations of the waste load allocation based on current river conditions that can be established now to apply for all 3 permits for summer low-flow season discharges until a TMDL is redone.

2. Dissolved Oxygen in the Harpeth River: August-September 2006. Final. Harpeth River Watershed Association. Bolze, Cain, and McFadden. Feb. 2007.

<http://www.harpethriver.org/library/library?id=55414>

This report compiled Dissolved Oxygen data from various sources since the EPA's data for the TMDL in 2001 up to 2006. TDEC's diurnal monitoring data from 2002 and 2003 is in Appendix E. HRWA's first Dissolved Oxygen study from 2002 is Appendix F. The 2006 D.O. monitoring coordinated by HRWA and TDEC was comprised of 10 sampling sites, 3 of which were TDEC sites. Maps in the report help to locate all the sites along almost the entire mainstem from the headwaters to the take out point at the Harpeth River State Park. USGS data on flow during the monitoring is included as well.

3. Dissolved Oxygen Study: June – July 2007. Final. Harpeth River Watershed Association. By Cain and Bolze.

<http://www.sitemason.com/files/bMJfB6/HRWA%20July%202007%20dissolved%20oxygen%20study%20final%20report.pdf>

Eight sites were monitored in the segment of the Harpeth River through downtown Franklin to see if affects of dissolved oxygen could be captured from the chemically contaminated seeps into the Harpeth River and from seeps into Liberty Creek that flows into the Harpeth. The contaminated groundwater is from chemicals released by Egyptian Lacquer Manufacturing Company. The upmost site is above the lowhead dam , and the furthest downstream site is downstream of the Franklin STP outfall.

4. Dissolved Oxygen in the Harpeth River: September 2007. Harpeth River Watershed Association. By Cain and Bolze. (electronic file)

The report is complete but without a discussion section because the most recent version was corrupted. The file is a scan of a printed version. Figure 1 that displays all the site data is missing one site (#10 at RM 84.8), but the data from that site are in the report. Just like with the 2006 survey, TDEC placed diurnal monitoring probes at 3 of the sites. This year's survey was the most extensive in distance and in number of sites.

5. Harpeth River Dissolved Oxygen Survey: September 2008. Draft. (electronic file).

This file has all the data from this year's survey in an excel spreadsheet with a summary table. TDEC wasn't able to employ the monitoring probes this year since they were in use in another watershed for the state's five-year cycle. The sites this year begin at the site below the Franklin STP outfall and the furthest downstream is at the Highway 70 bridge in Cheatham County.

6. Water Quality Analysis: Harpeth River Between Franklin and Kingston Springs, TN. Aquaeter. By Corn and Corn. For Harpeth River Watershed Association. September 2006.

<http://www.sitemason.com/files/faR5Vm/Water%20Quality%20Analysis.pdf>

This analysis discusses key assumptions in the EPA's TMDL for low dissolved oxygen, has estimated percentages of river flows that are treated effluent, and has TDEC's diurnal D.O. data from 2002 and 2003. Key assumptions in the TMDL include that the river will be at 6 mg/l of D.O. before the first STP outfall.

7. Dissolved Oxygen in the Harpeth River: Connecting Point Source, Nonpoint Source, and Water Withdrawals. Presentation to the TN AWRA by Aquaeter and HRWA. By Corn, Corn, Bolze, and Davee. April 2008. Powerpoint. (electronic file)

The powerpoint has EPA's Dissolved Oxygen data chart from the TMDL from August 2000 (p. 12), river flow data from the 2006 HRWA Dissolved Oxygen survey, three charts from TDEC's diurnal monitoring from 2002 and 2003 with estimated ranges of effluent percentage (pgs 14-16), and a simple mass balance for the Harpeth river to derive the flow needed to assimilate the design capacity of the Franklin sewer plant. If the Harpeth river just upstream of the Franklin outfall is 6 mg/l, then 96 cfs of flow is needed to provide enough oxygen to assimilate the effluent at the design flow of 12 MGD and current effluent concentrations. On page 23 is Figure 18 from the EPA TMDL that indicates that the BOD concentration in Franklin's effluent needs to be 3 mg/l for a 12 MGD design flow to meet the river's D.O. standard of 5 mg/l. This is lower than the 4 mg/l recommended in the TMDL summary table.

8. Two Memos via email by Dorene Bolze, Harpeth River Watershed Association, to EPA, USFWS, TWRA, USGS, Aquaeter, and others, on findings from Dissolved Oxygen surveys. March 08, 2007 re 2006 Dissolved Oxygen study and July 19, 2007 re June 2007 Dissolved Oxygen study in Franklin area. (electronic file)

The memos provide a summary of results that found low dissolved oxygen levels in violation of state water quality standards upstream and downstream of the various sewage treatment plant outfalls. Memos point to analysis of percent of river flow that is treated effluent during the monitoring period. Also discussed are assumptions in the EPA's TMDL for low dissolved oxygen and D.O. drop tied to the seeps of chemicals in the groundwater from Egyptian Lacquer.