IN THE OFFICE OF STATE ADMINISTRATIVE HEARINGS
STATE OF GEORGIA

UPPER CHATTAHOOCHEE RIVERKEEPER, INC.,	:	
Petitioner,	:	
v.	:	**Docket No.:**
	:	**OSAH-BNR-WQC-1107476-60-Miller**
F. ALLEN BARNES, DIRECTOR, ENVIRONMENTAL PROTECTION DIVISION, GEORGIA DEPARTMENT OF NATURAL RESOURCES,	:	
Respondent,	:	
FORSYTH COUNTY,	:	
Intervenor.	:	

FINAL DECISION

For Petitioner:

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For Intervenor:

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I. SUMMARY OF PROCEEDINGS

On September 16, 2010, the Petitioner, Upper Chattahoochee Riverkeeper, Inc. ("Riverkeeper"), filed a Petition for Hearing challenging the issuance of a National Pollutant Discharge Elimination System ("NPDES") permit to Forsyth County, Intervenor herein. The

permit authorizes Forsyth County to discharge up to six million gallons per day of treated wastewater to the Chattahoochee River from Forsyth County's Fowler and Shakerag Wastewater Reclamation Facilities ("WRFs").

The Petition identified six grounds upon which Riverkeeper sought to modify or invalidate the permit. On December 8, 2010, this Court entered an Order Denying Petitioner's Motion for Summary Determination and Granting in Part and Denying in Part Intervenor's Motion for Summary Determination ("Order on Summary Determination"). The Order on Summary Determination granted judgment as a matter of law in favor of Forsyth County and the Respondent, F. Allen Barnes, Director of the Environmental Protection Division of the Georgia Department of Natural Resources ("Director"), as to five of the six grounds. The evidentiary hearing on the one remaining ground was held March 22 through 24, 2011.[1]

Riverkeeper's remaining claim alleges that the permit, as issued, violates Georgia's antidegradation rule as to its limits on allowable effluent concentrations of fecal coliform bacteria and total phosphorus. See Ga. Comp. R. & Regs. r 391-3-6-.03 (DNR rules cited hereinafter as "DNR Rule 391-3-6-.##). In the Order on Summary Determination, this Court determined that EPD, as part of its antidegradation review, was required to assess whether the permitted levels of discharge pollutants would lower the water quality in the Chattahoochee River, and if so, whether such degradation was "necessary to accommodate important economic and social development." DNR Rule 391-3-6-.03(2)(b)(ii); see 40 C.F.R. § 131.12(a)(2). Based on the undisputed facts, the Court then concluded that since the permitted levels of fecal coliform bacteria and total phosphorus exceeded the background concentrations in the river, the permit

[1] The hearing was originally scheduled for January 24 through 28, 2011. However, following the entry of the summary determination order, the parties entered into settlement negotiations, and the hearing date was continued by agreement. The negotiations were ultimately unsuccessful. The hearing record closed on May 2, 2011, upon receipt of the parties' proposed Findings of Fact and Conclusions of Law.

would allow lower water quality. The Court further found that EPD had not determined whether and to what degree a degradation of water quality was necessary, in violation of the antidegradation rule. Thus, remaining at issue is whether the permit authorizes a necessary lowering of water quality after consideration of the technical and economic feasibility of alternative treatment levels, or whether such degradation is unnecessary.

The permit limits the Fowler and Shakerag WRFs' combined monthly average discharge of fecal coliform to 200 colony-forming units per 100 milliliters ("cfu/100 ml"), and limits the monthly average discharge of total phosphorus to 0.3 milligrams per liter ("mg/l"). Riverkeeper, contending that these permitted limits will unnecessarily degrade water quality in the river, proposes a monthly average discharge limit for fecal coliform bacteria of 2 cfu/100 ml and a monthly average discharge limit for total phosphorus of 0.08 mg/l. The Director and Forsyth County disagree, arguing that the permitted discharge will not degrade water quality.[2] Alternatively, they assert that any degradation of water quality is necessary, and that the permitted limits should, therefore, stand as issued.

After consideration of the evidence and arguments of the parties, the Court finds, consistent with its Order on Summary Determination, that the permitted discharge will result in

[2] Forsyth County and EPD concede that the authorized discharge effluent concentrations of fecal coliform bacteria and total phosphorus that would exceed the background levels in the river. However, they dispute the Court's conclusion, in the Order on Summary Determination, that these relatively small increases in background concentrations amount to a lowering of water quality under the antidegradation rule. At the hearing, therefore, they sought to litigate this issue. In Georgia, summary determination is a tool used to narrow the issues for hearing, and "[u]pon the trial of the action the facts so specified shall be deemed established, and the trial shall be conducted accordingly." Mays v. Citizens & Southern Nat'l Bank, 132 Ga. App. 602, 604; see id. at 605 ("The partial summary judgment is merely a pre-trial adjudication that certain issues shall be deemed established for the trial of the case.") (citations and internal quotations omitted). Both parties had sufficient opportunity to contest the relevant factual allegations at the summary determination stage, and all undisputed matters were accepted by the Court as true. Therefore, the factual findings made in the Order on Summary Determination were also established for purposes of the hearing. The Court's prior determination that permitted levels of fecal coliform bacteria and phosphorus in excess of ambient levels would cause degradation is a legal conclusion based on the undisputed facts; accordingly, it cannot be re-litigated at this stage. Further, even if the Court were inclined to revisit this issue, Riverkeeper proved by a preponderance of the evidence presented at the hearing the effluent concentrations authorized by the permit would degrade water quality in the river, thereby requiring an antidegradation review.

lower water quality in the Chattahoochee River. The Court further finds, after analyzing the technical and economic feasibility of alternative levels of treatment, that the level of degradation authorized by the permit is not necessary to accommodate important social or economic development in the surrounding area. Accordingly, for the reasons set forth below, this matter is **REMANDED** for reissuance of the permit with revised monthly average discharge limits of 23 cfu/100 ml for fecal coliform bacteria and 0.08 mg/l for total phosphorus.

II. FINDINGS OF FACT

A. Overview

On August 18, 2010, the Environmental Protection Division ("EPD") of the Georgia Department of Natural Resources ("DNR") issued NPDES permit no. GA0038954 to Forsyth County, authorizing the discharge of treated wastewater from the Fowler and Shakerag WRFs into the Chattahoochee River. (Ex. J-2.) The Fowler WRF has been operating since 2004, while construction of Shakerag is anticipated upon final permit approval. (T. 333, 335-37; Exs. J-19 at 5, P-132 at 3.) Although the two facilities will operate separately, their effluent will be combined and discharged at a single point within the Chattahoochee River National Recreation Area. (T. 278-79.) The discharge area lies 8.7 miles downstream from Buford Dam, which impounds Lake Lanier, and 27.5 miles upstream from Morgan Falls Dam, which forms Bull Sluice Lake. (Ex. J-1 at 5-6.) West Point Lake, another large impoundment operated by the U.S. Army Corps of Engineers, is located approximately 100 miles downstream. (T. 556.) The proposed discharge area is located eleven miles upstream of the Atlanta/Fulton County municipal water supply intake and fifteen miles upstream of the Dekalb County intake. (Ex. J-19 at 6.)

The permit establishes limits for both the volume and quality of wastewater discharged into the river. (Ex. J-2 at 5-8.) With respect to volume, the maximum authorized discharge

under the permit is 6 million gallons per day ("mgd"),[3] consisting of 2.25 mgd from the Fowler WRF and 3.75 mgd from the Shakerag WRF. (Ex. J-2 at 8.) The permit imposes effluent limitations on a number of water quality parameters, including fecal coliform bacteria and total phosphorus. (Ex. J-2 at 5-8.) Under the permit, the monthly average discharge limit for fecal coliform bacteria is 200 cfu/100 ml, and the monthly average discharge limit for total phosphorus is 0.3 mg/l. (Ex. J-2 at 8.) The permit also contains an "upset" provision in the event one of the WRFs is unable to meet its permit limits due to unexpected spikes in the influent.[4] (T. 841-42; Ex. J-2 at 16.)

At the hearing, the parties presented evidence on three permit limit alternatives for each disputed water quality parameter. Regarding fecal coliform bacteria, the parties addressed the following possible permit limits: 200 cfu/100 ml (the current permit limit); 23 cfu/100 ml (the standard for urban reuse); and 2 cfu/100 ml (the limit proposed by Riverkeeper). For total phosphorus, the parties identified these alternative permit limits: 0.3 mg/l (the current permit limit); 0.13 mg/l (the urban reuse standard); and 0.08 mg/l (Riverkeeper's proposed limit).

B. <u>The Chattahoochee River</u>

Over three million people use the Chattahoochee River each year, making it an important economic, recreational, and environmental resource for the state of Georgia and metropolitan Atlanta in particular. (T. 200-02, 212-13, 227-29, 285-86, 322-24.) Like all waters in Georgia, the Chattahoochee River is designated a high-quality water. (T. 256, 324, 517.) The river is

[3] Although the current permit authorizes a discharge of 6 mgd, the anticipated future discharge capacity of the combined facilities is 24 mgd as of 2035. (T. 301-02; Ex. J-9 § 6-1, -3.)

[4] The characteristics of municipal sewerage inflow are relatively consistent, except when a plant experiences an "upset." (T. 785-86.) An upset can occur when, for example, a septic hauling truck dumps a load of septic waste, or a restaurant disposes of a heavy grease load, directly into the sewer system without meeting pretreatment requirements. (T. 786, 802.) An upset provision provides a facility with an affirmative defense against civil, criminal, or administrative sanctions. (T. 842; Ex. J-2 at 16.)

both the primary source for drinking water and a significant recipient of wastewater discharge in the Atlanta area. (T. 212-14, 231, 233, 659.)

The Upper Chattahoochee Riverkeeper is a Georgia nonprofit corporation with over 5,000 members. (T. 213.) Its mission is to "protect and restore the quality and quantity of water in the Chattahoochee River Basin for people and for wildlife." (T. 211.) Members of the organization use the river for fishing, boating, wading, and swimming, among other uses. (T. 196-97, 211, 214, 280-81.) They are concerned about the impact of the proposed Fowler/Shakerag discharge on the quality of water in the river, especially regarding concentrations of fecal coliform bacteria and total phosphorus. (T-219-20, 231-32.)

1. Fecal Coliform Bacteria

Fecal coliform bacteria live in the intestinal tracts of warm-blooded animals, including humans. (T. 96; DNR Rule 391-3-6-.03(12)(a).) Although fecal coliforms are not *per se* harmful, they are "indicator organisms," meaning that they suggest the presence of pathogenic bacteria, viruses, and protozoans commonly found in fecal matter. (T. 96-99, 821-22, 838-39, 898.) Exposure to these organisms can cause significant and deleterious health effects in humans, including gastroenteritis, dysentery, and infection. (T. 96-99.) Because fecal coliforms are both easy and cost-effective to measure, their levels are often monitored as a benchmark of the health of a water body. (T. 96-100, 821-22.) A permit limit for fecal coliform bacteria acts as a proxy for limits on other pathogens as well. (T. 96-99, 821-22.)

The DNR Board has established specific water quality criteria for classified water usages. (T. 715; DNR Rule 391-3-6-.03(6).) Under DNR rules, the Chattahoochee River in the area of the discharge is subject to the fecal coliform bacteria standard for recreational waters of 200 cfu/100 ml. (T. 599, 715-16, 754; DNR Rule 391-3-6-.03(6)(b)(i).) The fecal coliform bacteria

standard established in the Fowler/Shakerag permit is identical to the recreational standard found in the rule. (Ex. J-2 at 5-8; DNR Rule 391-3-6-.03(6)(b)(i).) The standard in both the rule and the permit is measured as a 30-day geometric mean,[5] based on at least four samples collected from the same site at intervals not less than 24 hours. (T. 687, 715-16, 754; Ex. J-2 at 2.)

Dr. Elizabeth Booth, the manager of EPD's the watershed planning and monitoring program, has examined the water quality record of fecal coliform bacteria concentrations near the discharge area from 1995 through 2010. (T. 581, 686-87; Ex. P-40.) She calculated 52 separate 30-day geometric means from the data record and found the median value to be 53 cfu/100 ml. (T. 61, 601, 603-04, 686-87; Ex. P-40.) Accordingly, the best measure of the existing concentration of fecal coliform bacteria in the river is 53 cfu/100 ml as a geometric mean.[6] (T. 686-87; Ex. P-40.) Based on this measure, since the ambient quality of the Chattahoochee River is better than the quality of the authorized discharge, a discharge from the Fowler and Shakerag WRFs at the permitted fecal coliform bacteria concentration of 200 cfu/100 ml would degrade water quality in the area of the discharge. (T. 62, 604.) However, at a limit of 23 cfu/100 ml, which is the DNR standard for urban reuse, or irrigation, water,[7] the Fowler/Shakerag discharge would actually improve water quality, because the effluent

[5] A geometric mean is calculated by multiplying together the values of all sample data collected from the same site, then taking the nth root of the result (where "n" is the total number of samples in the data set). (T. 687.)

[6] Forsyth County presented evidence that the existing average (as distinguished from the geometric mean) concentration of fecal coliform bacteria is 349 cfu/100 ml. (T. 408-09; Ex. R-24 at 3 tbl. ES-1, 6-7.) This is an apples-to-oranges comparison upon which the Court declines to rely. The geometric mean is preferred to a simple average because it reduces the possibility that unusual concentrations of bacteria in one sample will skew the overall data. (T. 410.)

[7] The urban reuse standard is more stringent than the recreational water standard because, while the potential for bodily contact exists with both types of water, irrigation water is not diluted in a flowing stream prior to application. (T. 600-01.)

concentrations of fecal coliforms would be less than the background concentrations in the river. (T. 600-02, 604; DNR Rule 391-3-6-.03(6)(b)(i).)

2. Phosphorus

Phosphorus is a nutrient that is essential to all life and causes plant growth when combined with nitrogen and sunlight. (T. 62-64.) Phosphorus is not toxic and does not present a water quality concern in naturally-occurring concentrations. (T. 62-64, 70, 77, 605.) However, excessive levels of phosphorus may result in eutrophication, i.e., rapid algal growth and oxygen depletion caused by nutrient overenrichment in the water. (T. 605.)

Algal growth in a water body results from a complex interaction of phosphorus, nitrogen, and sunlight, although the precise impact of these causal parameters is poorly understood.[8] (T. 631-32.) In the Chattahoochee River, phosphorus is the "limiting nutrient." (T. 69, 530, 631-32; Ex. P-102 at 2-3.) This means that the growth rate of algae and aquatic plants depends on the amount of phosphorus that is added to the river. (T. 530-31.) When greater concentrations of phosphorus are present, the risk of eutrophication increases. (T. 30, 166, 605.)

When eutrophication occurs, naturally-occurring algae grow exuberantly, which may cause algal blooms. (T. 765-66; Ex. P-42 at 1.) Algal blooms may contain cyanobacteria or other toxins that are harmful to human health.[9] (T. 86-92; Exs. P-42, P-45.) In addition, algal blooms reduce the amount of oxygen present in the water body. (T. 78, 83-85, 605.) Depleted

[8] "The precise cause and effect relationships of nutrients in the water environment are not well quantified, the methods for determining a waterbody's nutrient assimilative capacity are not well developed, and the impacts to designated uses are difficult to quantify." (Ex. P-102 at 2.)

[9] These may include neurotoxins, hepatotoxins, tumor promoters, gastrointestinal toxins, and dermatitis toxins, which can cause serious disease or even death. (T. 85-92; Exs. P-42, P-45.)

oxygen levels can trigger fish kills,[10] an issue of particular concern for the Chattahoochee's trout fishery. (T. 78, 83-84, 605.) Algal blooms can also cause an unpleasant odor that requires additional treatment of drinking water. (T. 78-82, 606.)

At the present time, there is no evidence of any algal blooms in the Chattahoochee River. (T. 605-06.) However, even in the absence of algal blooms, the Court finds that increased phosphorus concentrations represent a degradation of water quality because higher levels of phosphorus increase the risk of harmful algal growth.[11] (T. 30, 412-13; Ex. P-103.) This finding is consistent with both the Order on Summary Determination and the evidence presented at the hearing, which is summarized below.

While there is no clear scientific consensus regarding acceptable levels of phosphorus in a river, it is generally recognized that concentrations of 25 to 50 parts per billion ("ppb") are sufficient for algae to grow. (T. 70-73; Ex. P-154 at 265.) The United States Environmental Protection Agency ("EPA") has suggested an in-stream phosphorus standard of 30 ppb for streams in ecoregion 45, which includes the Chattahoochee River, as a nutrient level that protects against overenrichment.[12] (T. 571-72; Exs. P-103 at v, 5, 20; R-24 at 4 tbl. 1.) Currently, the annual average phosphorus concentration in the area of the proposed discharge is 53 ppb, the

[10] During daylight hours, while algae are growing, they produce more oxygen than they consume. (T. 83.) However, at night, or when the algae die, they consume oxygen rapidly, depleting levels to the extent that fish may be unable to survive. (T. 83-85.)

[11] Some scientific studies have shown that increasing phosphorus concentrations by as little as 6 parts per billion (the equivalent of .06 mg/l) can result in a fourfold increase in algae growth. (T. 731-32; Ex. P-154 at 263-64.) However, it is also true that the velocity of the water in the Chattahoochee inhibits algal growth. Algae are more likely to grow in slow or stagnant water, whereas the Chattahoochee is relatively fast-moving due to periodic releases from Buford Dam. (T. 620-23, 680.)

[12] EPA's suggested standard is a "reference condition" derived in one of two ways. The first, preferred method is to choose the 75th percentile of a reference population consisting of "pristine" or "minimally impacted" streams in an ecoregion. If no such reference population exists, EPA uses the second method, which selects the 25th percentile of the population of all streams within the ecoregion. EPA has determined that these two methods yield equivalent results. The reference condition for ecoregion 45 is derived from the second method. (Ex. P-103 at 11.)

equivalent of 0.53 mg/l. (Exs. P-39; R-24 at 3, 6 tbl. 2.) Under the Fowler/Shakerag permit, Forsyth County is authorized to discharge effluent with a total phosphorus concentration of 0.3 mg/l, or 300 ppb. (T. 76, 621; Ex. J-2.) At that level, phosphorus concentrations in the area of the discharge would increase from 53 ppb to 58 ppb, well over the standard suggested by EPA. (T. 76, 621; Ex. R-24 at 5.)

In 2000, EPA directed the States to establish nutrient standards for all types of water bodies, including rivers.[13] (Ex. P-103.) In Georgia, however, no in-stream standards have yet been established.[14] (T. 627-28.) Due to the absence of an in-stream phosphorus standard for the Chattahoochee River, EPD applies a phosphorus standard for "total lake loading" in West Point Lake, which is located approximately 100 miles downstream of the proposed discharge. (T. 556, 578, 628-29.) Under this standard, total phosphorus levels at West Point Lake may not exceed 2.4 pounds per acre foot of lake volume per year. (T. 578, 629.) Of the total annual lake load, 1.4 million pounds per year are allocated to inflow from the Chattahoochee River, which includes phosphorus contributions from both point and non-point sources.[15] (T. 491-92, 578; DNR Rule 391-3-6-.03(17)(a)(iv).) Since 1995, the loading standard has been violated once, in

[13] Eutrophication is a significant problem in the United States, affecting more than eighty estuaries and bays and thousands of rivers, streams, and lakes. (Exs. P-103 at 1, I-4 at 2-5.) For this reason, regulatory agencies have begun to establish lower nutrient limits in NPDES permits, and total phosphorus "limits of 0.5 and even 0.1 mg/l or less are becoming much more common." (Ex. I-4 at 7-15.)

[14] Georgia has developed nutrient standards for six publicly-owned lakes, including West Point Lake. (T. 645-47; Ex. P-102 at 8.) However, Dr. Booth believes that is unnecessary to establish in-stream nutrient standards for rivers when a standard exists for a downstream receiving lake, and she intends to resist EPA's directive on this point. (T. 647.)

[15] The term "point source" refers to facilities like the Fowler and Shakerag WRFs that discharge pursuant to an NPDES permit. (T. 64; 33 U.S.C. § 1362(14).) "Non-point sources" are all other sources of pollutants, such as stormwater runoff and sewer overflows. (T. 657.)

2005,[16] but the phosphorus load has otherwise been within allowable limits and appears to be trending downward.[17] (T. 656-57; Exs. R-27 at 3, I-7.)

EPD also measures the impact of phosphorus on water quality at West Point Lake in terms of chlorophyll *a*, the pigment found in all green plants. (T. 626-27.) Chlorophyll *a* is a eutrophication response parameter (as distinguished from phosphorus, which is a causal parameter) that indicates algal growth. (T. 178-79, 705.) As a general rule, it is expected that high concentrations of total phosphorus will exist during periods of high flow, while increased concentrations of chlorophyll *a* will occur during hot, sunny, low-flow periods. (Ex. R-27 at 3.) EPD has established a chlorophyll *a* standard at West Point Lake of 27 micrograms per liter ("µg/l") as a growing season average that may not be exceeded more than once in a five-year period. (T. 738-41.) Therefore, although West Point Lake exceeded its 27 µg/l chlorophyll *a* limit once during the past five years, this was not considered a violation of the standard. (T. 738-41.) Additionally, in 2000, the lake approached the chlorophyll *a* standard but did not violate it. (T. 737-38.)

Dr. Booth testified that the discharge authorized by the Fowler/Shakerag permit would increase the chlorophyll *a* concentrations at West Point Lake by only 0.1 µg/l, which would be virtually undetectable, given a chlorophyll *a* test error rate of plus or minus 15%. (T. 652-54.)

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[16] It is possible that this violation of the standard was caused by non-point source runoff related to high precipitation and/or anomalies in the data collection during that year. (T. 657.)

[17] In 2003, based on the results of a model evaluating total phosphorus loading in the Chattahoochee River between Buford Dam and West Point Lake, EPD recommended a maximum monthly average effluent total phosphorus concentration of 0.3 mg/l for new or expanded point source discharges into the river. (Exs. J-13, J-19 at 8-9, R-27.) The modeling report indicated that permit limits of 0.03 mg/l would result in compliance with the loading standard for West Point Lake if appropriate non-point source controls were implemented. (Ex. R-27 at 2.) Non-point source controls, including a ban on high-phosphate detergents introduced in 1992, have, in fact, reduced phosphorus contributions to the Chattahoochee from non-point sources. (T. 628-29.) However, the modeling report also noted that compliance with an in-stream standard in the 30 ppb range recommended by EPA would likely require more stringent phosphorus limits. (Exs. P-103 at v, 5, 20, R-27 at 3-4.)

Dr. Booth then concluded that the permitted discharge would not degrade water quality in the river. However, the Court declines to rely on Dr. Booth's testimony in this regard, because it remains undisputed that the Fowler/Shakerag discharge will increase total phosphorus concentrations in the discharge area by 5 ppb, thereby lowering the water quality in the river. The Court is simply not persuaded that the concentration of chlorophyll *a* measured in a lake 100 miles downstream of the discharge point can properly determine whether or not degradation has occurred in the area of the discharge.

C. Facility Design and Wastewater Treatment Technology

1. The Fowler WRF

The Fowler plant was originally designed as part of a reuse system in which treated wastewater is sold to irrigation customers along an 11-mile pipeline. (T. 781-82, 934-35 Ex. J-12, J-13, P-132.) At the end of the pipeline, water that has not been sold to reuse customers is sprayed on fields at the Threatt Land Application System ("LAS"). (T. 782; Ex. J-12.) Fowler treats its reuse wastewater for phosphorus only minimally, to 1.0 mg/l, because phosphorus is a nutrient that is desirable for irrigation purposes. (T. 781-82.) However, for fecal coliform bacteria, Fowler's reuse wastewater is subject to a limit of 23 cfu/100 ml. (T. 600, 757-59.)

On December 10, 2007, Forsyth County obtained an NPDES permit for the Fowler facility as a supplement to its LAS permit. (T. 329; Ex. P-16.) The 2007 permit established a significantly lower total phosphorus limit and authorized the Fowler WRF to discharge treated wastewater into Big Creek, a tributary of the Chattahoochee River, during the "wet weather" months of November through April. (Ex. P-16.) Fowler's wet weather discharge capacity serves as a backup to the reuse system, allowing flexibility during periods of limited demand for reuse water. (T. 782; Ex. J-13 at 3.) Under the 2007 Fowler permit, the limit for fecal coliform

bacteria is 23 cfu/100 ml, while the limit for total phosphorus is 0.13 mg/l. (T. 820, 845; Ex. P-16.) These limits are consistent with the standards for reuse facilities discharging into tributaries of the Chattahoochee River, which were established as part of EPD's 2002 permitting strategy.[18] (Ex. J-13.)

Fowler uses a biological treatment system, including membrane bioreactor technology, to treat sewerage for both reuse and discharge. (T. 465-68, 779-81.) When wastewater arrives at Fowler, it first passes through a screen, which removes large debris. (T. 780.) Following a grit removal process to eliminate sand and rocks, the sewerage flows into a bioreactor, where microorganisms in activated sludge consume the organic matter, break it down into carbon dioxide, and produce new activated sludge biomass. (T. 465-66, 780.) During this process, much of the phosphorus from the wastewater is removed and taken up by the activated sludge. (T. 466-67.) The remaining phosphorus is treated with chemicals that are added directly to the activated sludge. (T. 468.) Excess biomass must be removed daily to prevent overproduction and maintain the plant's operations. (T. 467.)

In its chemical addition process, Fowler uses a flow-paced chemical feed system for ferric chloride, whereby the amount of chemical added to the bioreactor fluctuates automatically based on the influent flow rate.[19] (T. 783.) However, the amount of ferric chloride required for phosphorus removal is dependent not just on the rate of flow, but also on the influent concentration of phosphorus. (T. 783.) Fowler's system requires manual testing of the influent,

[18] In 2002, after modeling results showed that the river lacked assimilative capacity during critical low flow conditions, the agency adopted a long-term approach for discharges in the Chattahoochee River basin. (T. 519-21; Ex. J-13 at 1.) The strategy emphasized the reuse of treated wastewater, combined with wet-weather discharges into the river's tributaries, which still maintained some assimilative capacity. (T. 598; Ex. J-13 at 2-4.) For such facilities, EPD established permit limits of 23 cfu/100 ml for fecal coliform and 0.13 mg/l for total phosphorus. (Ex. J-13 at 3-4.)

[19] Inflow to a wastewater plant varies according to the time of day, and can generally be predicted based on a diurnal curve. (T. 785.)

manual adjustment of the chemical feed based on the test results. (T. 784.) Using its activated sludge system with chemical addition, Fowler has consistently treated its effluent to a total phosphorus level of 0.06 mg/l or less. (T. 333, 396, 458-59, 884-85, 917-18, 966-67; Exs. P-149, P-151, P-158, P-159.)

After chemical addition is complete, a vacuum pulls the wastewater through fine-pored membranes that strain solids from the water. (T. 780-81.) Fowler's membranes, which are .04 micrometers, screen out fecal coliforms and most other bacteria and viruses. (T. 780-81, 822.) However, because a small number of pathogens may pass through either the fittings or a frayed membrane, the water is also treated with ultraviolet disinfection following the membrane process. (T. 410-11, 826-27, 840-41.) The ultraviolet disinfection process eliminates any remaining fecal coliforms or other pathogens.[20] (T. 410-11, 822-23.) Consequently, since Fowler began operations in 2004, its effluent has consistently tested below detection limits for fecal coliform bacteria. (T. 333-34, 861-63, 965-66; Exs. P-132 at 3, P-150.)

Under the 2010 Fowler/Shakerag permit, Forsyth County will construct a new discharge pipeline to the Chattahoochee River. (T. 846-47, 934-35.) Prior to discharge, effluent from both facilities will be combined and infused with dissolved oxygen using a cascade aerator. (T. 825.) The planned aerator is an open-air, stair-step structure approximately sixty feet wide that directs the effluent into the discharge area. (T. 825.) Because the aerator must be open to the air to

[20] While membrane technology is able to remove fecal coliforms effectively, it is unable to eliminate all of the other pathogens for which fecal coliform serves as an indicator bacteria. (T. 822, 900.) Ultraviolet disinfection, which inactivates all pathogens, is therefore a necessary component of the wastewater treatment process. (T. 822-23.) Fowler utilizes an ultraviolet radiation dose of 50 millijoules per cm^2, which is consistent with a fecal coliform bacteria limit of 23 cfu/100 ml. (T. 821, 898.) Although a higher dose of ultraviolet light is not needed to achieve technical compliance with a more stringent fecal coliform bacteria standard of 2 cfu/100 ml, a dose of 100 millijoules per cm^2 would be required to ensure that other pathogens for which fecal coliforms serve as an indicator are also eliminated. (T. 822-23, 898-900.)

function properly, water passing through it is susceptible to contamination by animal feces.[21] (T. 825.) This type of contamination does not present a water quality concern. (T. 891.) However, because effluent is tested at the discharge point, inadvertent contamination could impact the facilities' measured compliance with a fecal coliform bacteria limit less than 23 cfu/100 ml. (T. 453-54, 824-25; Ex. J-2 at 5.)

After the wastewater passes through the aerator, it will be discharged into the river through a diffuser pipe. (T. 851-52.) Nozzles on the diffuser will disperse the effluent and integrate it with the flowing water in the river. (T. 851.)

2. The Shakerag WRF

The Shakerag plant, once constructed, will use the same principal technology as Fowler but will treat wastewater exclusively for discharge, without reuse capability. (T. 777, 799.) Shakerag, like Fowler, will use screens for debris removal. (T. 799.) However, the Shakerag facility will contain a set of fine screens, in addition to the coarse screens found at Fowler, to help preserve the integrity of its filtering membranes.[22] (T. 799-800.) The Shakerag WRF will have a similar grit removal system and a similar but enhanced biological technology. (T. 800.) Using this enhanced technology, Shakerag's bioreactors were designed to achieve a total phosphorus limit of 0.3 mg/l without chemical addition. (T. 800.) Therefore, at the existing permit limits, Shakerag's operators expect to use chemical addition only as a backup method of phosphorus removal in the event of an upset. (T. 801-02.) The new plant's original design included a side stream phosphorus polishing facility that would treat wastewater from both

[21] Most aerators are open to the air to enable oxygen infusion. (T. 825.) To fully eliminate the risk of contamination, the aerator would need to be built inside an enclosed structure, and air exchangers would have to be added to inject dissolved oxygen into the effluent. (T. 891-92.)

[22] The fine screens will help remove fibers that can clog the membranes. (T. 799-800.)

WRFs after Fowler's irrigation volume had been consumed. (T. 817-18.) However, Forsyth County discarded this option after its engineers determined that the cost of building the polishing facility, estimated at $4.6 million, was greater than the cost of treating to lower phosphorus levels with chemical addition. (T. 817-19.)

After the phosphorus removal is complete, Shakerag, like Fowler, will use fine-pored membranes and ultraviolet disinfection to remove fecal coliforms and other pathogens prior to discharge. (T. 800.) Effluent from both WRFs will then be combined, aerated, and discharged through the diffuser. (T. 825, 851-52.)

D. Technical and Economic Feasibility of Alternative Levels of Treatment

1. Fecal Coliform Bacteria

The parties agree that it is both technically and economically feasible for the Fowler and Shakerag WRFs to meet a permit limit of 23 cfu/100 ml for fecal coliform bacteria.[24] (T. 26-27, 345, 837, 862; Ex. R-24 at 2, 6-7.) Both Fowler and Shakerag are designed to treat fecal coliforms to a level of 23 cfu/100 ml or less. (T. 26.) When maintained and operated efficiently, the facilities will consistently produce effluent with fecal coliform bacteria levels at or below 23 cfu/100 ml without any additional membranes, chemicals, or other treatment of any kind. (T. 452.) Lowering the permit limit to 23 cfu/100 ml would therefore have no impact on the operation of the facility and would not result in increased costs. (T. 837, 861-62.) Further, since

[24] Gwinnett County's F. Wayne Hill plant is subject to a fecal coliform bacteria limit of 2 cfu/100 ml under a permit issued in 2008. (T. 880; Ex. P-34 at 5-8.) Other Georgia facilities required to meet limits of 23 cfu/100 ml include Fulton County's Cauley Creek WRF and the City of Gainesville's Flat Creek facility, under permits issued in 2010 and 2007, respectively. (T. 830, 844-45; Exs. P-32 at 6-7, P-33 at 5.)

effluent discharged at a fecal coliform bacteria limit of 23 cfu/100 ml would be cleaner than the river itself, it would not degrade water quality in the area of the discharge.[25] (T. 26-27.)

2. Total Phosphorus

The parties also agree that it is technically feasible for the Fowler and Shakerag plants to treat total phosphorus to effluent concentrations of either 0.13 or 0.08 mg/l with chemical addition alone.[26] (T. 777, 837.) Even at one of these limits, however, some degradation of water quality would occur because the background concentrations of total phosphorus in the river would still increase, albeit to a lesser degree than under the existing limit of 0.3 mg/l.[27] (Ex. R-24 at 3-4.) The parties disagree regarding whether achieving a permit limit lower than 0.3 mg/l is economically feasible based on the costs of chemical addition and an appropriate margin of safety. Based on the evidence presented, the Court finds that in addition to being technically feasible, a phosphorus limit of 0.08 mg/l is economically feasible and allows an adequate engineering safety buffer.[28]

Phosphorus reduction at both facilities is directly correlated to the amount of chemicals used, which increases operating costs. (T. 782-83, 795, 804-05, 836-37.) The cost of chemical addition can be estimated using performance data and discharge monitoring reports from the

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[25] It is unnecessary to evaluate the technical and economic feasibility of a permit limit of 2 cfu/100 ml because a permit limit of 23 cfu/100 ml will not degrade water quality.

[26] Forsyth County has expressed concern regarding Fowler's ability to achieve a limit of 0.08 mg/l consistently, due to the possibility of plant upsets or mechanical failures. (T. 785-86.) However, these are essentially economic concerns related to the cost of recommended upgrades rather than technical concerns.

[27] At an effluent concentration permit limit of 0.13 mg/l, ambient total phosphorus concentrations in the Chattahoochee would increase from 53 ppb to 55 ppb. (Ex. R-24 at 3 tbl. ES-1.) At a limit of 0.08 mg/l, in-stream concentrations would increase by 1 ppb, to 54 ppb. (Ex. R-24 at 3 tbl. ES-1.)

[28] Pursuant to its 2008 permit, Gwinnett County's F. Wayne Hill plant is required to meet a total phosphorus limit of 0.08 mg/l. (T. 880; Ex. P-34 at 5-8.) The Cauley Creek and Flat Creek facilities are subject to phosphorus limits of 0.13 mg/l. (T. 830, 844-45; Exs. P-32 at 6-7, P-33 at 5.)

Fowler WRF, which is currently meeting a phosphorus limit of 0.13 mg/l pursuant to its 2007 permit. (T. 797-99, 808-10, 941-43.) In fact, Fowler has been discharging effluent at a monthly average phosphorus level of .06 mg/l or less. (T. 333, 396, 458-59, 966-67, 884-85, 917-18; Exs. P-149, P-151, P-158, P-159.) At the current inflow rate of 0.947 mgd, Fowler spends approximately $27,540.00 per month ($348,975.00 per year) on chemicals and additional sludge removal to achieve this level of phosphorus reduction. (T. 332-33; Ex. P-149.)

Based on these current operating costs, the estimated total cost of treating phosphorus at the Fowler WRF to a level of 0.13 mg/l, rather than 0.3 mg/l, ranges between $1.7 million and $3.7 million, expressed as a net present value over twenty years, depending on the rate at which flows increase to the permitted capacity. (T. 797; Ex. I-1 at 6.) The costs associated with meeting a limit of 0.08 mg/l would be even higher, but would still represent a small fraction of the $40 million overall construction cost of the new Shakerag WRF and expanded Fowler WRF under the current permit. (T. 408, 859.) Additional, but lesser, costs would be incurred to achieve a phosphorus limit of either 0.13 or 0.08 mg/l at the Shakerag facility.[29] (T. 810, 824; Ex. I-1 at 6.) These expenses are significantly less than the estimated $120 million cost of a no-discharge alternative to the Fowler/Shakerag discharge, which EPD previously determined was "not prohibitive of the County providing this alternative." (T. 350-53; Ex. R-4.) The costs of additional phosphorus reduction at the Fowler and Shakerag WRFs would be passed on to Forsyth County consumers, resulting in sewer rate increases of approximately 10%. (T. 942-45.)

[29] These costs have not been quantified. (T. 810.) However, since the plant was designed to meet a phosphorus limit of 0.3 mg/l with biological technology alone, the cost of chemical addition at Shakerag would be significantly less. The potential also exists for design modifications that would improve biological performance at a cost less than the anticipated operating costs of chemical addition. (T. 810; Ex. I-1 at 6.) As an alternative, Forsyth County would have the option of building the phosphorus polishing facility that was part of the original design for the combined WRFs. (T. 818-20; R-24 at 10.) The estimated cost of the side stream facility, including recommended upgrades, is $10.6 million. (Ex. R-24 at 3 tbl. ES-1, 10.)

For an average consumer using 6,000 gallons of water per month, this translates to an increase of $3.04 per month. (T. 944-45.)

The design of a wastewater treatment plant is based on a target effluent concentration with a built-in safety factor. (T. 801.) Forsyth County proposes a safety factor of 50% for the Fowler WRF, which, at a permitted phosphorus limit of 0.08 mg/l, would require additional membranes, increased tankage volume for biological removal, and an improved screening process. (T. 793-94.) The estimated cost of the recommended upgrades is $9 million, at a net present value over twenty years. (T. 794.) However, the Fowler facility has shown that it is able to achieve a phosphorus limit of 0.08 mg/l with an engineering safety buffer of 33% through chemical addition alone, without any plant upgrades or modifications. (T. 456-57; Exs. P-149, P-151.) The Court finds that this safety buffer allows a sufficient margin of error. Moreover, a wastewater treatment facility must be expected to address maintenance issues and consider upgrades periodically. (T. 789-92, 829-30, 940, 947.)

Forsyth County argues that its facilities require a safety margin for potential upsets, which happen on occasion. (T. 785-86.) In fact, on February 28, 2011, the Fowler WRF experienced an upset. (T. 786.) During the upset, which lasted approximately nine days, the influent fouled the plant's membrane system and caused its activated sludge biomass to fail. (T. 786.) Fowler's operators discharged the facility's effluent at the Threatt LAS to avoid exceeding the 0.13 mg/l phosphorus limit required under its Big Creek discharge permit. (T. 786-87.) Forsyth County argues that, without a greater safety margin, the Fowler and Shakerag WRFs could be subject to fines because EPD is unlikely to grant leniency for upsets except during a hurricane. (T. 842, 951-52.) However, nothing in the upset provision limits its use to hurricanes only. (T. 844.) The Court finds that the upset provision allows for unexpected variances as

authorized by EPD, and the Fowler and Shakerag WRFs do not require a supplemental safety margin to protect against fines and ensure their ability to discharge effluent with a total phosphorus concentration limit of 0.08 mg/l.

III. CONCLUSIONS OF LAW

Riverkeeper has challenged the Director's issuance of NPDES permit no. GA0038954 to Forsyth County under O.C.G.A. § 12-2-2(c)(2), which provides that "[a]ny person who is aggrieved or adversely affected by any order or action of the director shall . . . have a right to a hearing before an administrative law judge of the Office of State Administrative Hearings . . . acting in the place of the Board of Natural Resources." The proceeding is *de novo* in nature, and the evidence presented at the hearing is not limited to that which was considered by the Director prior to his issuance of the permit. Ga. Comp. R. & Regs. r. 616-1-2-.21(3). As a third party challenging the issuance of a permit, Riverkeeper bore the burden to prove, by a preponderance of the competent evidence presented at the hearing, that the Director's issuance of the permit was unlawful. Ga. Comp. R. & Regs. rr. 616-1-2-.07(1), .21(4); see also Friends of the Chattahoochee, 298 Ga. App. 753, 768 (2009) (the administrative law judge is required "to consider the applicable facts and law anew, without according deference or presumption of correctness to the EPD's decision, and to render an independent decision on whether the Challengers carried their burden to prove by the preponderance of the evidence that the permit should not have been issued."). In this case, Riverkeeper met its burden.

The Order on Summary Determination explained that EPD's antidegradation review required an assessment of whether the level of pollutants in the permitted discharge would degrade the quality of the receiving water, and if so, whether such degradation was "necessary to accommodate important economic and social development." DNR Rule 391-3-6-.03(2)(b)(ii);

see 40 C.F.R. § 131.12(a)(2). Based on the undisputed facts on summary determination, the Court found that the permitted limits for fecal coliform bacteria and total phosphorus would allow the discharge to exceed the ambient levels of these elements in the Chattahoochee River.[30] The Court further determined that although additional wastewater capacity was necessary to accommodate important economic and social development[31] in the areas to be served by the Fowler and Shakerag WRFs, EPD failed to determine whether and to what degree a degradation of water quality was necessary. Thus, the issue remaining for hearing was whether the limits set forth in the Permit represent a necessary degradation of water quality, based on an analysis of the economic and technical feasibility of alternative levels of treatment.

The Court finds, after careful consideration of the evidence and arguments of the parties, that the limits on fecal coliform bacteria and total phosphorus set forth in the Fowler/Shakerag permit are not necessary to accommodate important economic or social development in the discharge area. The Court further finds that a revised discharge limit for fecal coliform bacteria of 23 cfu/100 ml will not degrade water quality in the Chattahoochee River, and that a revised permit limit for total phosphorus of 0.08 mg/l is both technically and economically feasible.

A. The Clean Water Act

The Federal Water Pollution Control Act ("Clean Water Act" or "Act") prohibits the discharge of pollutants except when applicable requirements of the statute and its implementing regulations are met. 33 U.S.C. § 1311. The Clean Water Act requires states to establish water quality standards "to protect the public health or welfare, enhance the quality of water[,] and serve the purposes of [the Act]." 33 U.S.C. § 1313(c)(2)(A). Through national goals and

[30] See discussion, supra, at n.2.

[31] The parties agree that additional discharge capacity is necessary to accommodate important economic and social development in the discharge area. The dispute centers on what level of treatment should be required.

policies "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," the Act calls for "areawide waste treatment management planning processes [to] be developed and implemented to assure adequate control of sources of pollutants," as well as "a major research and demonstration effort . . . to develop technology necessary to eliminate the discharge of pollutants into navigable waters." 33 U.S.C. § 1251(a)(5)–(6) (emphasis added).

EPA oversees implementation of the Clean Water Act, which authorizes EPA to issue NPDES permits for pollutant discharge. 33 U.S.C. § 1342(a). EPA, in turn, may authorize states to issue NPDES permits once EPA has approved the state's program. Id. § 1342(b); 40 C.F.R. § 131.4(b). Under Clean Water Act regulations, states must "develop and adopt a statewide antidegradation policy and identify the methods for implementing [the] policy" consistent with EPA's requirements.[32] 40 C.F.R. §§ 131.12(a), 131.6(d), 131.4(a). "This antidegradation policy provides a multi-level approach for the protection of water quality[, and] specifies the framework to be used in making decisions regarding changes in water quality."[33] 63 Fed. Reg. 36,742, 36,779–80 (July 7, 1998).

"[The a]ntidegradation requirements are typically triggered when an activity is proposed that may have some effect on existing water quality."[34] 63 Fed. Reg. 36,780. At a minimum, a

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[32] Once developed, a state's antidegradation policy is submitted to EPA for review and approval. 40 C.F.R. §§ 131.12(a), 131.6(d), 131.4(a); see also 63 Fed. Reg. 36,781.

[33] EPA has noted that "the antidegradation policy is significantly underused as a tool to attain and maintain water quality and plan for and channel important economic and social development that can impact water quality." 63 Fed. Reg. 36,780.

[34] EPA has explained that

> [i]dentifying the universe of activities that trigger antidegradation requirements is a fundamental and often controversial issue because of the number and variety of activities that can affect water quality. Clearly, a wide range of activities that affect water quality may be subject to antidegradation requirements, and States and Tribes have considerable flexibility in applying antidegradation policies.

63 Fed. Reg. 36,780.

tier 2 review requires that "[w]here the quality of the waters exceed levels necessary to support [designated uses], that quality shall be maintained and protected unless the State finds . . . that allowing lower water quality is necessary to accommodate important economic or social development in the area . . . ." 40 C.F.R. §§ 131.12(a)(2). See 33 U.S.C. § 1370 ("[A] State . . . may not adopt or enforce any effluent limitation [or other limitation or standard] which is less stringent than [that imposed by the Clean Water Act]"); Pud No. 1 v. Wash. Dep't of Ecology, 511 U.S. 700, 704 (1994). The policy must also assure that "the highest statutory and regulatory requirements for all new and existing point sources" are achieved. 40 C.F.R. § 131.12(a)(2).

Any party issued an NPDES permit is obligated to comply with all conditions established in the permit. An intentional or negligent permit violation may subject the permittee to civil, criminal, and administrative actions. In the event that a facility is unable to comply with its permit limits due to an unexpected incident, EPA has established an upset provision. 40 C.F.R. § 122.41(n). An "upset" is defined as

> an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventive maintenance, or careless or improper operation.

40 C.F.R. § 122.41(n)(1)–(4) (emphasis omitted).

EPA has authorized Georgia's EPD to issue NPDES permits pursuant to 33 U.S.C. § 1342(b). Accordingly, EPD issues NPDES permits to facilities that discharge pollutants pursuant to the Georgia Water Quality Control Act and the Clean Water Act. O.C.G.A. § 12-5-30; 33 U.S.C. § 1342.

B. The Georgia Water Quality Control Act

As the entity responsible for water quality in Georgia, EPD may establish water quality standards and minimum standards for treatment of discharges, among other things, to oversee the control and management of water pollution and surface water use. O.C.G.A. §§ 12-5-21(b), 12-5-23(a). To determine whether an NPDES permit should be issued, and under what terms, EPD follows the standards promulgated by DNR. These standards must comply with the minimum requirements established by EPA pursuant to its authority under the Clean Water Act.[35] O.C.G.A. § 12-5-23(a)(1)(R), (4)(A); 33 U.S.C. § 1342(b). Specifically, the EPD director must "[e]stablish . . . standards of water purity for any of the waters in [Georgia], which specify the maximum degree of pollution permissible . . .," after EPD has "consider[ed] the technical means available for the reduction of pollution and the economic factors involved." O.C.G.A. § 12-5-23(c)(9). The director must also "[e]stablish or revise through rules and regulations . . . or permit conditions, or both, effluent limitations based upon an assessment of technology and processes unrelated to the quality of the receiving waters of this state." Id. § 12-5-23(c)(13).

As required under the Clean Water Act and the Georgia Water Quality Control Act, DNR has established water quality standards for certain water bodies in Georgia. DNR Rule 391-3-6-.03. For example, in waters classified as "recreational," like the Chattahoochee River, the fecal

[35] In issuing NPDES permits, "[t]he director may, after public notice and opportunity for public hearing, issue a permit which authorizes the person to make such discharge, upon condition that such discharge meets or will meet, pursuant to any schedule of compliance included in such permit, all water quality standards, effluent limitations, and all other requirements established pursuant to this article." O.C.G.A. § 12-5-30(a). The Director is charged with ensuring Georgia's compliance with the Clean Water Act. See O.C.G.A. § 12-5-23(c)(15) ("In the performance of his or her duties, the director shall . . . [p]erform any and all acts and exercise all incidental power necessary to carry out the purposes and requirements of this article and of the Federal Water Pollution Control Act . . . relating to [Georgia]'s participation in the National Pollutant Discharge Elimination System established under this act . . . ."). Consequently, any conflict between the Georgia Water Quality Act and the Clean Water Act is to be resolved "as may be necessary to prevent loss of such funds to the division or any department of state government affected and to secure to the same the full benefit of the federal laws." O.C.G.A. § 12-5-50.

coliform bacteria standard is 200 cfu/100 ml.[35] DNR Rule 391-3-6-.03(6)(b)(i)(2). DNR has not established in-stream standards for phosphorus in the Chattahoochee. However, total phosphorus loading at West Point Lake, for which the Chattahoochee is a major tributary, "shall not exceed 2.4 pounds per acre foot of lake volume per year." DNR Rule 391-3-6-.03(17)(a)(iv). In addition, the annual total phosphorus loading to West Point Lake from the river at U.S. 27 is limited to 1,400,000 pounds. DNR Rule 391-3-6-.03(17)(a)(viii)(3).

Georgia's antidegradation rule also explains, consistent with the federal rule, that

> [w]here the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the division finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the division's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the division shall assure water quality adequate to protect existing uses fully. Further, the division shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

DNR Rule 391-3-6-.03(2)(b)(ii) (emphases added). Therefore, even if a proposed discharge meets the established standards, a tier 2 antidegradation review is triggered when a discharge will lower water quality, and requires a determination of "necessity" and an evaluation of "important economic or social development." DNR Rule 391-3-6-.03(2)(b)(ii).

"[T]he finding of necessity is among the most important and useful aspects of an antidegradation program . . . ." 63 Fed. Reg. 36,784. Based on EPA guidance,[36] a necessity

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[35] "Fecal coliform not to exceed the . . . geometric mean[] based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours." DNR Rule 391-3-6-.03(6)(b)(i).

[36] Although EPA's 1998 Advance Notice of Proposed Rulemaking offered a detailed discussion of antidegradation policy, no interpretive regulation was ever adopted. However, given the absence of guidance from EPD regarding the necessity determination, the Court accepts EPA's formulation of the standard.

determination requires an analysis of pollution control/pollution prevention alternatives to "ensure[] that all feasible alternatives to allowing the degradation have been adequately evaluated, and that the least degrading reasonable alternative is implemented." Id. "[W]here less-degrading alternatives are more costly than the pollution controls associated with the proposal, the State or Tribe should determine whether the costs of the less-degrading alternative are reasonable." Id. Additionally, "absent important social or economic benefit, degradation under tier 2 must not be allowed."[38] Id. Thus, if the permitted levels of discharge lower water quality, EPD must consider alternative treatment levels in addition to an analysis of no-discharge permit alternatives,[39] and decide which treatment level is the least-degrading reasonable alternative based on an analysis of economic and technical feasibility.[40]

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[38] To help states determine social and economic importance in tier 2 antidegradation reviews, EPA published the "Interim Economic Guidance for Water Quality Standards: Workbook" in March 1995. 63 Fed. Reg. 36,784; see Water Quality Standards Handbook—Second Edition, app. M (Mar. 1995) (EPA-823-B-95-002), available at http://www.epa.gov/scitech/swguidance/standards/handbook/index.cfm (last visited May 26, 2011).

[39] It is undisputed here that a no-discharge permit alternative is not desirable, as it is a consumptive use that is inconsistent with the Metropolitan North Georgia Water Planning District Long-Term Wastewater Management Plan. (T. 351-52, 933-36; Exs. J-3, J-4, J-9 § 4-1, R-4.)

[40] The Order on Summary Determination further explained this requirement, after an extensive review of the antidegradation rule, as follows:

> The response received from EPA recognized that Georgia's Implementation Procedures provided for an analysis of alternatives to a proposed discharge, and further stated, in relevant part:
>
> > EPA recommends you consider clarifying that analysis of the economic and/or technical feasibility of an alternative level of treatment be included as part of the antidegradation review. EPA recommends a thorough evaluation of available alternatives to avoid lowering of water quality.
>
> Letter from James D. Giattina, Director, EPA Region 4 Waste Management Division, to David M. Word, EPD Assistant Director at 2 (June 17, 2005) . . . . The letter goes on to cite EPA's 1998 Advance Notice of Proposed Rulemaking, which discussed the analysis of alternatives concept, [discussed infra]. Water Quality Standards Regulation, 63 Fed. Reg. 36,742, 36,783 (proposed July 7, 1998) (to be codified at 40 C.F.R. pt. 131). Similarly, EPA's NPDES Permit Writer's Manual, notes that "[d]epending on the outcome of the [antidegradation] review, the permit could be written to maintain the existing high water quality or could be written to allow some degradation." NPDES Permit Writer's Manual § 6.6.2 (EPA-833-K-10-001, September 2010).

(Order Sum. Det. 21.)

C. Issues

Riverkeeper contends that, because the ambient quality of the River is better than the quality of the permitted discharges of fecal coliform bacteria and total phosphorus, and because the Fowler and Shakerag facilities are capable of removing more pollutants than the Permit requires, the Permit will cause an unnecessary degradation of water quality. Riverkeeper therefore urges the adoption of more stringent permit limits, which it asserts are both technically and economically feasible. In contrast, Forsyth County and EPD argue that the permitted discharge levels are adequate because they will not significantly lower the quality of the receiving water. They further argue that any degradation of water quality resulting from the discharge is necessary, and that lower limits for fecal coliform bacteria and total phosphorus are not technically and/or economically feasible.

1. Significance Threshold

As a preliminary matter, the Court addresses Forsyth County's and EPD's argument regarding the significance of the degradation that would be caused by the proposed discharge. They contend, citing EPA's 1998 Advance Notice of Proposed Rule Making ("ANPRM"), that if a proposed discharge limit will not significantly degrade the water quality in the receiving water, further antidegradation review is not required. 63 Fed. Reg. 36,783. The ANPRM noted that in a number of states, "tier 2 implementation procedures often include guidelines which are used to determine when the water quality degradation that will result from a proposed activity is significant enough to warrant further antidegradation review."[41] Id. In this case, however,

[41] EPA has discussed its concerns with a "significance" determination, finding that although useful, there is a great deal of variation in how states define "significant degradation" because the regulation does not specify a significance threshold. 63 Fed. Reg. 36,783. Under the significance approach, "some States may not adequately prevent cumulative water quality degradation on a watershed scale." Id. In cases where states "rel[y] entirely on a pollutant loadings comparison to numeric criteria for the tier 2 evaluation, new loadings of nutrients may not even be evaluated under tier 2." Id.

because no significance threshold has been incorporated into the text of Georgia's antidegradation rule or EPD's Implementation Procedures,[43] the Court finds that any lowering of water quality triggers an antidegradation review. DNR Rule 391-3-6-.03; Resp't's Mot. Sum. Det. Ex. 1.

2. Fecal Coliform Bacteria

Riverkeeper argues that the permit violates the antidegradation rule because a fecal coliform bacteria limit of 200 cfu/100 ml exceeds the background levels of the bacteria in the Chattahoochee River, which will cause an unnecessary lowering of water quality. Riverkeeper suggests that a permit limit for fecal coliform bacteria of 2 cfu/100 ml is both technically and economically feasible for the Fowler and Shakerag facilities. Forsyth County and EPD assert, in contrast, that no necessity determination was required because the facility is designed to meet a standard of 23 cfu/100 ml, which will result in better water quality regardless of the permitted limit. Alternatively, they contend that a fecal coliform bacteria limit of 2 cfu/100 ml is neither technically nor economically feasible.

Under Georgia's antidegradation rule, water quality that exceeds levels necessary to support existing uses of the water body "shall be maintained and protected" subject to a determination that degradation is necessary. Here, the permitted discharge limit for fecal coliform bacteria is 200 cfu/100 ml, calculated as a geometric mean. Although this limit is identical to the standard established for recreational waters under DNR Rule 391-3-6-.03(6)(b)(i)(2), it is significantly higher than the geometric mean of the existing background concentrations of fecal coliforms in the Chattahoochee River, which is 53 cfu/100 ml.

[43] In Hughey v. Gwinnett County, the antidegradation rule in effect in 2004 was applied where "[t]he undisputed facts show[ed] that the discharge w[ould] degrade the water quality in Lake Lanier," but the court did not address a "significance" threshold before conducting an antidegradation review. 278 Ga. 740, 740 (2004).

Therefore, because the permit authorizes a discharge of fecal coliform bacteria that will lower the quality of the receiving water,[44] the permit is unlawful unless the resulting degradation is necessary based on an analysis of technical and economic feasibility.

Notably, the evidence is undisputed that both the Fowler and Shakerag WRFs, when maintained and operated efficiently, will consistently produce effluent with fecal coliform bacteria levels at or below 23 cfu/100 ml, with no costs or changes to the facilities' designs or operations. A permit limit of 23 cfu/100 ml is therefore technically and economically feasible, and the existing permit limit of 200 cfu/100 ml is not necessary.

Although Riverkeeper proposes a permit limit of 2 cfu/100 ml, no analysis of the feasibility of this level of treatment is required because a limit of 23 cfu/100 ml will not degrade water quality in the river. At a limit of 23 cfu/100 ml, the quality of the discharge would be better than the background concentrations in the river. Consequently, even if a permit limit of 2 cfu/100 ml were technically and economically feasible, the Court lacks authority to impose this modification because a limit of 23 cfu/100 ml does not trigger an antidegradation review. The fecal coliform bacteria limit in the Fowler/Shakerag permit is therefore revised to 23 cfu/100 ml.

3. Total Phosphorus

According to Riverkeeper, the permit also violates the antidegradation rule because a total phosphorus limit of 0.3 mg/l, which exceeds the background concentrations in the river, will unnecessarily degrade water quality. Riverkeeper proposes, instead, a permit limit on total phosphorus of 0.08 mg/l. Forsyth County and EPD oppose Riverkeeper's suggestion, arguing that the permitted limit of 0.3 mg/l will not degrade water quality. In the alternative, they

[44] Whether or not the facilities intend to discharge effluent at or near the fecal coliform bacteria limit authorized by the permit is immaterial. The relevant inquiry is whether the permit would allow degradation of water quality.

contend that while a permit limit of either 0.08 or 0.13 mg/l is technically feasible, such a limit is not economically feasible and is therefore not required.

As noted above, if water quality in the Chattahoochee River exceeds levels necessary to support its existing uses, "that quality shall be maintained and protected" unless degradation is necessary. At the hearing, there was no evidence that the discharge authorized by the Fowler/Shakerag permit would exceed the total phosphorus loading standard at West Point Lake, a downstream receiving water body. See DNR Rule 391-3-6-3(17)(a)(viii). However, allowing the Fowler and Shakerag WRFs to discharge effluent with a total phosphorus concentration of 0.3 mg/l, as authorized by the permit, would raise background concentrations of phosphorus in the discharge area from 0.053 mg/l to 0.058 mg/l, an increase of approximately 10%. Thus, a total phosphorus limit of 0.3 mg/l would lower water quality at the discharge area, triggering a tier 2 antidegradation review that mandates an assessment of whether such degradation is necessary, or whether an alternative level of treatment is technically and economically feasible.

a. Technical Feasibility

Forsyth County and EPD do not dispute that it is technically feasible for the Fowler and Shakerag WRFs to comply with more stringent permit limits. The evidence at the hearing centered on a comparative analysis of discharge limits of 0.3 mg/l, 0.13 mg/l, and 0.08 mg/l, as well as the various technologies available to treat phosphorus to these levels. As discussed in detail in the Findings of Fact, above, the Fowler plant has demonstrated through its operations that it is technically feasible to meet a total phosphorus standard of 0.08 mg/l using the facility's existing biological treatment system augmented by chemical addition. Accordingly, the Court finds that it is technically feasible for the Fowler and Shakerag facilities to discharge total phosphorus at a limit of 0.08 mg/l.

b. Economic Feasibility

The parties disagree regarding the economic feasibility of operating the combined WRFs to meet a total phosphorus limit below 0.3 mg/l. Riverkeeper argues that it is economically feasible to operate the WRFs at a limit as low as 0.08 mg/l for total phosphorus because the potential additional costs represent a small fraction of the overall costs. Forsyth County counters that it is not economically feasible to achieve effluent phosphorus concentrations of 0.13 mg/l or below because of the added operational costs and/or capital expenditures for upgrades or redesign.

The central inquiry concerning economic feasibility is whether the additional costs are reasonable. "[W]here less-degrading alternatives are more costly than the pollution controls associated with the proposal, the State or Tribe should determine whether the costs of the less-degrading alternative are reasonable." 63 Fed. Reg. 36,784. As noted above, both facilities are capable of meeting a lower phosphorus limit through chemical addition alone, although some upgrades or modifications have been recommended to achieve an engineering buffer of 50%. Even if a safety margin of 50% were necessary, however, the cost of chemical addition and/or the recommended modifications would not render a phosphorus limit of 0.08 mg/l economically infeasible.

While the Court respects Forsyth County's desire to keep costs low to benefit its customers, the economic feasibility analysis does not require selection of the lowest-cost option. The Court also acknowledges the facility's interest in a margin of safety to allow for variances in influent and other unexpected issues that arise during plant operations. However, Forsyth County's desire for an optimal safety margin cannot justify a less stringent permit limit. As Georgia's Supreme Court held in Hughey v. Gwinnett County, "the [antidegradation] regulation

does not cite the 'convenience of the parties' or 'fear of regulatory violations' as justifications for greater water degradation." 278 Ga. 740, 743 (2004). "Allowing wholesale water quality degradation is not justified by the concern that [a permittee] might face an occasional fine for a permit violation." Id. at 743. Finally, in weighing the economic feasibility of a more stringent phosphorus limit, the Court has also considered EPD's determination that the estimated $120 million cost of a no-discharge alternative to the Fowler/Shakerag permit did not establish the necessity of the discharge on economic grounds. Accordingly, the Court concludes that a permit limit of 0.08 mg/l for total phosphorus is economically feasible.

IV. DECISION

For the reasons set forth herein, NPDES permit no. GA0038954, issued to Forsyth County for the Fowler and Shakerag WRFs, is hereby is **REMANDED** for reissuance of the permit with revised monthly average discharge limits of 23 cfu/100 ml for fecal coliform bacteria and 0.08 mg/l for total phosphorus.

SO ORDERED, this 1st day of June, 2011.

KRISTIN L. MILLER
Administrative Law Judge

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