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VIA EMAIL DELIVERY to Lebone.Moeti@dnr.state.ga.us

Lebone Moeti
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**Re: Draft Non-Farm Surface Water Withdrawal Permit – Southern Nuclear
Operating Company – Vogtle Electric Generating Plant (Units 3 and 4)**

Dear Mr. Moeti:

On behalf of the Savannah Riverkeeper and the Southern Alliance for Clean Energy, the Southern Environmental Law Center and the Turner Environmental Law Clinic at Emory Law School submit the following comments on the draft Surface Water Withdrawal Permit No. 017-0191-11. The draft permit is proposed to be issued to Southern Nuclear Operating Company (“Southern Company” or “the Company”) for the operation of two new nuclear units, Units 3 and 4, at the existing Vogtle Electric Generating Plant in Burke County, Georgia. Units 3 and 4 are currently under construction and, according to the most recent projections, will not commence operation until late 2017 and 2018, respectively.¹

We note at the outset that our comments are not as detailed as they might have been had the Georgia Environmental Protection Division (EPD) granted our request for a modest extension of the comment deadline. An extension was warranted given recent winter weather and accompanying delays in getting the permit file (which was not available when first requested), as well as the complexity and importance of the issues involved. In addition, because Units 3 and 4 are years from commencing operation, there is no reason that a short extension could not have been afforded.

EPD’s notice states that “[a] public hearing may be held if the Director of EPD finds a significant degree of public interest in the draft permit.” We believe significant public interest in the draft permit does exist for several reasons, including: (1) the implications of such large water withdrawals for numerous existing and potential water users in Georgia and South Carolina, (2) the impacts such large withdrawals will have on the Savannah River and the Savannah Harbor,

¹ See Dave Williams, *Georgia Power Reports Substantial Progress at Plant Vogtle*, Atlanta Business Chronicle, Feb. 28, 2014, available at <http://www.bizjournals.com/atlanta/news/2014/02/28/georgia-power-reports-substantial.html?page=all>.

and (3) the overall importance of this permit as the first new permit proposed since EPD instituted its process to establish a dissolved oxygen Total Maximum Daily Load (TMDL) for the Savannah Harbor. Accordingly, we respectfully urge EPD to hold a public hearing at which we and others can deliver appropriate comments.

I. Background on the Savannah River

From its headwaters in the Blue Ridge Mountains, the Savannah River flows along the Georgia-South Carolina border for over 300 miles before reaching the Atlantic Ocean. Its drainage basin covers some 10,577 square miles and hosts a number of diverse ecological systems, including agricultural and forest systems, as well as a network of free-flowing streams, swamps, and tidal marshes.

The Savannah River is crucial to the culture and economy of the area. It provides water to more than 1.4 million people, including the residents of Savannah and Augusta, two of Georgia's largest cities; it offers recreation to millions who visit the river and its reservoirs each year; and it provides shipping routes to and from the Savannah Harbor, the country's fourth largest port.

Twenty percent of the water withdrawn from the river is used for industrial purposes, such as cooling and in-plant use at Georgia Power Company's Plant McIntosh and Plant Vogtle (existing Units 1 and 2). Together, these two plants are permitted to use up to 257 million gallons per day (mgd) of the Savannah River's surface water, more than all of the state's other permitted users combined.² And Georgia's users are not the only ones making withdrawals. Like Georgia, South Carolina relies on the river's limited resources to satisfy its current and future water demands.

As a result of these heavy demands, the Savannah River and its basin have seen a steady reduction in flow and aquifer levels over time. This reduction in flow becomes particularly problematic in times of drought, which have been frequent and severe over the last decade, and which will become more frequent and intense with climate change. For residents who live along the river and its basins, such as Lake Hartwell, this reduction in flow impacts both their water needs and their property values. The Lake Hartwell Association has previously expressed concerns regarding the Vogtle expansion, and the lack of long-term analysis of water needs in the basin.³

The river also receives large volumes of toxic discharges, harming struggling fisheries and earning the river the unwelcome distinction of the fourth most toxic river in the country.⁴ Of

² Plant Vogtle Units 1 and 2 are currently permitted to withdraw a daily maximum of 127 mgd, and the coal-fired unit at Plant McIntosh is permitted to withdraw a daily maximum of 130 mgd. Georgia Power has recently applied for permit renewal at Plant McIntosh. With the additional 74 mgd allowed by the draft withdrawal permit for Plant Vogtle Units 3 and 4, Georgia Power (a 45.7% owner of these units) will remain by far Georgia's largest water user on the Savannah River. *See also* Georgia EPD, List of Georgia Non-Farm Surface Water Withdrawal Permits (Revised May 2013), available at http://www.gaepd.org/Documents/regcomm_wpb.html.

³ *See generally*, Lake Hartwell Association, Inc. *Vogtle Electric Generating Plants Units 3 and 4, A Position Paper of the Lake Hartwell Association*, November 20, 2008, available at <http://www.lakehartwellassociation.org/portals/0/Proposed%20Vogtle%20Plant%20Expansion.pdf>.

⁴ *See* Georgia Water Coalition, *Georgia's Dirty Dozen 2013*, at 16 (November 2013), <http://www.garivers.org/gawater/pdf%20files/DirtyDozenReport2013.pdf>.

specific importance, Plant Vogtle Units 1 and 2 already discharge 10,000 gallons of liquid waste per minute into the river. Releases of tritium, a radioactive form of hydrogen that can cross the placenta and affect the developing fetus, from Plant Vogtle Units 1 and 2 and the Department of Energy's nearby Savannah River Site have caused local health concerns. These types of discharges are expected to increase with the addition of Units 3 and 4, but the implications of these increases to human and environmental health will not be evaluated. As EPD is aware, radiological monitoring in Georgia along the Savannah River was de-funded by the Department of Energy many years ago, leaving a crucial data void on the Georgia side of the river.

In addition to these concerns, declining dissolved oxygen (DO) levels in the Savannah River have long been problematic. The current Savannah Harbor Expansion Project has only added to the already considerable concern over dissolved oxygen and salinity levels—and their impacts on marshland and wildlife—in the lower portions of the river. More than a decade ago, the Savannah River Basin was listed on Georgia's CWA 303(d) list as impaired for dissolved oxygen, indicating that a DO TMDL was necessary. Since that time, DO impairment in the Savannah River Basin has persisted, prompting the Environmental Protection Agency (EPA) in 2010 to issue an "Interim TMDL" for dissolved oxygen in the Savannah Harbor region of the Savannah River Basin (replacing an earlier 2006 TMDL established by EPA).⁵ The Interim TMDL described the overall waste load for the Savannah River and established a stakeholder group consisting of major industrial and municipal dischargers from both Georgia and South Carolina.⁶ Since the Interim TMDL's implementation, the stakeholder group has been working to establish an allocation strategy for the waste load.⁷ This collaboration is now nearly complete, with 98 percent of the allocation agreed upon and only 2 percent remaining under discussion.⁸

Throughout this waste load allocation process, discussions among Georgia, South Carolina, and EPA have been ongoing as to whether a watershed restoration plan should be established in lieu of completing a TMDL for the Harbor.⁹ The restoration plan – known as a "5R plan" – is being developed by EPD in cooperation with South Carolina Department of Health and Environmental Control, with input from EPA and major dischargers.¹⁰ At this time, it appears a 5R plan has been drafted and may be implemented soon.¹¹ Regardless of which strategy is finally adopted – establishing a new TMDL or a 5R plan – it will reflect years of efforts by Georgia, South Carolina, EPA, EPD, and key stakeholders along the Savannah River to make headway on the DO problem.

EPD is reportedly awaiting finalization of this watershed restoration strategy before reissuing National Pollutant Discharge Elimination System (NPDES) permits for major

⁵ See December 2013 Meeting Summary of Savannah-Upper Ogeechee Regional Water Planning Council, available at http://www.savannahupperogeechee.org/documents/20131205_SUO_Meeting_Summary.pdf.

⁶ *Id.*

⁷ *Id.*

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*

¹¹ See Draft Subcategory 5R Documentation for Point Source Dissolved Oxygen Impaired Water in the Savannah River Basin, Georgia and South Carolina, Savannah Harbor, Georgia Environmental Protection Division in Cooperation with South Carolina Department of Health and Environmental Control (not dated).

dischargers along the Savannah River, including Plant Vogtle.¹² Indeed, because the assimilative capacity for DO in the Savannah Harbor is already exceeded by current discharges, it has been EPD's practice for several years to extend rather than to renew NPDES permits while awaiting the outcome of the TMDL/5R process. For example, Plant Vogtle's NPDES Permit for Units 1 and 2, GA0026786, has been expired and administratively extended since May 21, 2004.

The proposed water withdrawal permit comes before the conclusion of the long and arduous TMDL/5R process, and its issuance so far in advance of the operation dates of the two new reactors seems almost designed to evade that process. There is no question that the massive proposed withdrawals will result in consumptive losses that exacerbate DO problems downstream. As EPD has acknowledged, under a worst case scenario consumptive losses could be as high as 88 percent. The draft permit seeks to mitigate this problem by mandating oxygen injection and other engineered measures, but its requirements do not go nearly far enough.

Accordingly, as set forth in more detail below, EPD should withdraw the draft permit so that it may be reconsidered within – rather than outside of – the ongoing regional discussions concerning the river's future. Because Units 3 and 4 will not be operational until more than three and four years from now, there is ample time to craft a permit that is appropriately protective of water quality and downstream uses.

II. Background on the Draft Permit and its Conditions

The draft permit allows Southern Company to withdraw surface water from the Savannah River for the purposes of cooling and in-plant use. Draft Permit at 1. The permit would authorize daily withdrawals of up to 74 million gallons per day and average monthly withdrawals of up to 62 million gallons per day. *Id.* This is in addition to the 127 million gallons per day already authorized under the water withdrawal permit for existing Units 1 and 2.

The draft permit includes various standard and special conditions based purportedly on “the unique hydrologic, environmental, water uses, and related hydraulic and environmental assessments and regulatory conditions in the Savannah River Basin.” *Id.* These include recordkeeping and reporting requirements: Southern Company must submit annual reports listing the gallons per day withdrawn (based on an average of the daily withdrawals for each month), as well as the maximum 24-hour withdrawal. *Id.* at Standard Condition No. 4. In addition, Southern Company must submit to EPD by the 10th day of each calendar month a monthly Surface Water Withdrawal Report for all daily raw water withdrawals from the prior month. *Id.* at Special Condition No. 5.

Other conditions are more substantive in nature and appear intended to mitigate impacts to water quantity and quality associated with the permit. Southern Company must return the amount of water withdrawn, “less evaporation and draft losses,” to the river on a daily basis. *Id.* at Special Condition No. 2. Such return discharges must be made in accordance with the facility's NPDES permit and occur through release points authorized under that permit. *Id.* At this time, however, the required NPDES permit has not been issued (or even applied for).

¹² EPD Comments on the U.S. Nuclear Regulatory Commission's (NRC) Draft Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site, at 2 (Nov. 28, 2007) (EPD Comments).

To address “actual or theoretical dissolved oxygen conditions associated with this [draft surface water withdrawal] Permit,” Southern Company must construct and install an oxygen injection system, such as a Speece Cone, capable of injecting up to 4,000 lbs of oxygen per day in the area of mile 14 in the Savannah Harbor. *Id.* at Special Condition No. 3. Southern Company must in turn operate such an injection system from April 15 to November 15 of each year. *Id.* EPD states that the condition is based on its hydrodynamic modeling of streamflows and is necessary to “conservatively address dissolved oxygen conditions in the Savannah Harbor.” *Id.* As EPD elaborates,

This special condition is included in this Permit to address potential or theoretical hydraulic conditions in the Savannah Harbor and other unique conditions in the area of the Harbor, including the absence of flood control infrastructure, the absence of reservoirs downstream of the withdrawal, and the activities associated with the Savannah Harbor Expansion Project.

Id.

The draft permit also requires Southern Company to “abide by applicable water conservation requirements.” *Id.* at Special Condition No. 6. The permit and any future modifications to it are expressly conditioned upon implementation of the applicable Water Conservation Plan. *Id.* at Special Condition No. 8. Further, Southern Company “must demonstrate an effort to increase water use efficiency.” *Id.*

Southern Company must likewise “abide by applicable drought response requirements.” *Id.* at Special Condition No. 7. That is the totality of the draft permit’s provisions relating to drought protection.

Southern Company may freely seek modification of any of the permit’s conditions, including the requirement for operation of an oxygen injection system, based on “environmental assessments, technological improvements, hydrodynamic evaluations or other information available on modeled conditions in the Savannah River or Savannah Harbor.” *Id.* at Special Condition No. 4. There is no reciprocal provision authorizing EPD to seek modifications that may be necessary to protect water quality and downstream uses.

III. Legal Background

EPD’s issuance of surface water withdrawal permits is governed by Georgia’s Water Quality Control Act. *See* O.C.G.A. § 12-5-31 *et seq.* In accordance with this Act, before issuing surface water withdrawal permits, EPD shall consider:

[T]he extent to which any withdrawals . . . are reasonably necessary, in the judgment of the director, to meet the applicant’s needs and shall grant a permit which shall meet those reasonable needs; provided however, that the granting of such permit ***shall not have unreasonably adverse effects*** upon the other water uses in the area, including but not limited to public use, farms use, and potential as well as present use . . .

O.C.G.A. § 12-5-31(g) (emphasis added). Further, EPD shall “give preference to an existing use over an initial application.” O.C.G.A. § 12-5-31(f).

In applying for surface water withdrawal permits, applicants must comply with the Water Quality Act's regulations governing such permitting. *See* Ga. Comp. R. & Regs. r. 391-3-6-.07(4). Among other things, permit applications must include a Water Conservation Plan and a Drought Contingency Plan. Ga. Comp. R. & Regs. r. 391-3-6-.07(4)(b)8, 9. These regulatory requirements are critical to EPD's determination of whether requested surface water withdrawals are "reasonably necessary" to meet the applicant's needs and whether they will have "unreasonably adverse effects" on other water users.

IV. Specific Comments

Issuing the proposed permit as drafted would violate the Georgia Water Quality Act because EPD has not fully considered the extent to which the requested water withdrawals are reasonably necessary, nor whether the permit will have unreasonably adverse effects on other uses, including public use. *See* O.C.G.A. § 12-5-31(g). To comply with the statute, (a) EPD should consider issuing the water withdrawal permit in conjunction with the required NPDES permit for Units 3 and 4, as well as ongoing regional planning efforts; (b) the permit's special condition requiring oxygen injection should be supported and expanded to include maintenance and monitoring for effectiveness; (c) Southern Company's Water Conservation Plan must satisfy all regulatory requirements; (d) Southern Company's Drought Contingency Plan must satisfy all regulatory requirements; and (e) EPD should require Southern Company to conduct and incorporate climate modeling in its long-range planning. These deficiencies are described in more detail below.

a. The Draft Permit Should be Withdrawn and Reconsidered in Conjunction with the Required NPDES Permit and Regional Planning Efforts

The draft permit's issuance precedes completion of the ongoing TMDL/5R process designed to address low DO conditions in the Savannah Harbor. In deference to that process, EPD has delayed reissuance of all NPDES permits for major dischargers along the Savannah River, including Plant Vogtle Units 1 and 2. *See, e.g.*, EPD Comments (noting that Vogtle NPDES Permit No. GA0026786 was extended effective 5/21/2004 in response to the TMDL for dissolved oxygen in the Savannah Harbor). While Commenters do not agree with EPD's legally-unsustainable policy of indefinite delay in the reissuance of NPDES permits, consistency requires a similar approach here.

To Commenters' knowledge, Southern Company has yet to apply for an NPDES permit for Plant Vogtle Units 3 and 4, even though the draft water withdrawal permit acknowledges on its face that one will be required. *See* Draft Permit at Special Condition No. 2 (stating that water returned to river from the system will be done through NPDES release points in accordance with the NPDES permit); *see also* the Water Conservation Plan and Drought Contingency Plan (making assessments based upon consumptive use instead of total amount withdrawn). As a matter of law, a new or amended NPDES permit will be required before the new water

withdrawal system can operate.¹³ Thus, it makes sense as a both a legal and practical matter that the two permits be considered in tandem.

This makes sense as a policy matter as well. In its 2007 comments on the NRC's EIS for the new Vogtle reactor units, EPD clearly contemplated that the NPDES and water withdrawal permits would be considered together and "in the context of current water planning efforts, consumptive water losses, and any contingencies necessary to manage future droughts." EPD Comments at 2. EPD noted that cooling water discharges resulting from the proposed expansion would lack oxygen demanding constituents. As such, the increased discharges would not be covered under the TMDL for DO. *Id.* Nevertheless, EPD expressed concern regarding the handling of sanitary wastewaters resulting from the expansion, which EPD felt could contribute to an increase in Biochemical Oxygen Demand. EPD noted that under the TMDL no new increases in oxygen-demanding loads could be permitted between Thurmond Dam and the Savannah Harbor because the harbor's assimilative capacity was already exceeded. *Id.*

The draft water withdrawal permit presents similar concerns, though of potentially far greater magnitude. Consumptive losses resulting from the withdrawals threaten to dangerously undermine the assimilative capacity of the river, particularly during times of drought. This could in turn exacerbate low DO conditions downstream. EPD acknowledges this potential in the draft permit; EPD considers necessary "the injection of at least 1,000 lbs of oxygen per day" in order to "offset any actual or theoretical dissolved oxygen conditions associated with this Permit." Draft Permit at Special Condition No. 3. And to achieve that result, EPD proposes reliance on an unproven technology without conditions sufficient to cover the risk that it may not perform as required.¹⁴ *See* further discussion in Section IV.b., *infra*.

EPD is right to be concerned about the draft permit's impact on DO levels in the Savannah Harbor. But EPD is wrong to propose this permit apart from issuance of the Units 3 and 4 NPDES permit, as well as separate from ongoing regional planning processes that have yet to reach fruition. If the NPDES permit cannot be issued until the TMDL/5R process is completed, then neither should EPD proceed with consideration of the water withdrawal permit. EPD should instead remain true to the regional planning focus it articulated in its 2007 comments and address water quality and quantity impacts at the same time.

Further, by statute, EPD must consider whether a permit will have unreasonably adverse effects on other users, including public uses. O.C.G.A. § 12-5-31(g). Because the water withdrawal permit and the required NPDES permit for Plant Vogtle Units 3 and 4 are so intertwined, both legally and practically, consideration of unreasonable adverse effects from the draft permit should include effects from the NPDES permit as well. As such, EPD should

¹³ *See* 33 U.S.C. §§ 1311(a), 1342 (2014) (all discharges are illegal unless permitted); O.C.G.A. § 12-5-30 (2014); *see also* Vogtle Electric Generating Plant, NPDES Permit Implementation and Control, No. GA 0026786, at EPD 2.21-14 (December 9, 2004); *see also* 40 C.F.R § 122.62(a) (for amended permits), and 40 C.F.R § 122.21 (for new permits).

¹⁴ The draft permit fails to specify the number or proposed locations of the Speece Cones. Such determinations are likely to trigger additional permitting obligations under federal statutes such as the Clean Water Act, 33 U.S.C. § 1251 et seq., and the Rivers and Harbors Act, 33 U.S.C. § 401 et seq. These permitting obligations will in turn require regional planning and coordination, as well as consultation with EPA, which is another basis for delaying consideration of the draft permit until such time as all water-related permitting obligations can be considered on a cumulative basis.

withdraw the draft permit until it can be considered alongside a new or amended NPDES permit and with the completed TMDL/5R process as its backdrop.

b. The Draft Permit's Special Condition for an Oxygen Injection System Is Inadequate to Mitigate Impacts on Dissolved Oxygen Levels

To address DO conditions associated with the permit, EPD proposes to require construction and operation of “an oxygen injection system, such as a Speece Cone, capable of injecting up to 4,000 lbs of oxygen per day in the area of river mile 14 of the Savannah Harbor.” Draft Permit at Special Condition No. 3. This requirement is unaccompanied by any provision for measuring the effectiveness of this unproven technology. Nor is it specified how long the system will be required to operate.

Instead, the draft permit expressly contemplates that Southern Company can seek to eliminate this requirement “based on environmental assessments, technological improvements, hydrodynamic evaluations, or other information available on modeled conditions or actual conditions in the Savannah River or Savannah Harbor.” *Id.* at Special Condition No. 4. There is no specification of what such assessments or evaluations should include or when, or even whether, they must be completed.

As EPD is well aware, the use of Speece Cones is a requirement of the Savannah Harbor deepening project. But the technology has yet to be proven effective. As a result, a settlement agreement among multiple parties to the legal challenge over the harbor deepening (including various parties from South Carolina) includes numerous detailed provisions designed to evaluate the system's effectiveness. *See* Compromise and Settlement Agreement dated April 24, 2103, attached hereto as Exhibit A, at pp. 2-4. For example, the settlement agreement requires continuous daily water quality monitoring at various locations, as well as the refining and updating of hydrodynamic and water quality models specifically for DO. *Id.* at 3. The express purpose of such modeling and monitoring is to “confirm that the Oxygen Injection System will mitigate for the DO impacts of the Project.” *Id.* In addition, the agreement requires that the system be installed and operated on a “test run” basis before the dredging project can commence. *Id.* at 3-4. The purpose of such advance testing is to “demonstrate [the system's] ability to mitigate dissolved oxygen impacts” of the project. *Id.* at 3.

The settlement agreement also requires that the oxygen injection system be maintained. *Id.* at 4 (the U.S. Army Corps of Engineers (Corps) must “operate and maintain the Oxygen Injection System during the life of the Project.”). To safeguard the effectiveness of the Speece Cones, the Georgia Ports Authority is required to establish a letter of credit or escrow account in the amount of \$2,000,000 – “a contingent fund to be drawn upon for operation and maintenance of the Oxygen Injection System should the Corps fail to provide for an annual appropriation for or otherwise fail to fund the operation and maintenance of the Oxygen Injection System.” *Id.* at 6-7. The oxygen injection system is additionally described as “a top priority for discretionary annual operations and maintenance funds” received above normal maintenance requirements. *Id.* at 5.

Significantly, the settlement agreement does not propose to rely on Speece Cones alone to protect water quality. The agreement includes various additional mitigation measures

designed to improve the water quality and aquatic functioning of the river, with an emphasis on oxbow restoration projects. *Id.* at 8.

In contrast, the draft water withdrawal permit under consideration here is devoid of any such provisions. Although the requirement for an oxygen injection system purports to be based upon “hydrodynamic modeling of streamflows conducted by EPD,” there is no requirement for any future modeling, monitoring, or maintenance. As a result, the draft permit provides no means for judging the system’s effectiveness at mitigating DO impacts. The draft permit leaves it entirely within Southern Company’s discretion whether to perform any assessments or evaluations of the system’s effectiveness, and leaves it equally within the Company’s discretion to determine the form and frequency of those assessments or evaluations.

Moreover, the draft permit relies exclusively on oxygen injection technology, such as a Speece Cone, as the sole mitigation measure for addressing DO impacts. There is no requirement for any environmental or conservation projects, such as oxbow restoration efforts, that are likely to be more effective at addressing DO conditions because they recreate natural ecological flow patterns.

In sum, the draft permit’s call for an oxygen injection system appears patterned after the Savannah Harbor settlement, but without any of the additional protections provided by that agreement. At a minimum, EPD should require a preliminary and longer-term monitoring and maintenance plan by which the effectiveness of the system can be ensured. Without such provisions, EPD has not fully considered whether the draft permit will have unreasonably adverse effects on other water users in the area.

c. The Water Conservation Plan is Inadequate

The draft permit requires Southern Company to “abide by applicable water conservation requirements,” and is conditioned upon its implementation of a Water Conservation Plan (WCP). Draft Permit at Special Condition Nos. 6 & 8. This provision is only as good as the measure it incorporates by reference. Unfortunately, the Company’s Water Conservation Plan reflects a lack of commitment to water conservation, beginning with its selection of cooling technology and extending to its failure to identify *any* additional water conservation activities. As such, EPD does not have adequate information to determine whether the draft permit will have unreasonable adverse effects on other users, or the extent to which the requested water withdrawal is reasonably necessary, and on those bases should withdraw the draft permit. *See* O.C.G.A. § 12-5-31(g).

A Water Conservation Plan is a fundamental requirement of any water withdrawal permit application for non-farm uses. Ga. Comp. R. & Regs. r. 391-3-6-.07(4)(b)8. The plan is required to address multiple items, and if an item is not addressed, to state why that item was not an appropriate part of the plan. *Id.* Among other things, the plan must address “[a]ny additional current or planned activities pertaining to system management that will contribute to water conservation.” *Id.* at (4)(b)8(i)(IV). The Water Conservation Plan must also address long term planning. Specifically, “permittees must incorporate water conservation into long term water demand and supply planning.” *Id.* at (4)(b)8(ix). Southern Company’s Water Conservation Plan fails to satisfy these requirements.

As a planned activity that contributes to water conservation, Southern Company hails its “efficient circulating water system,” which it touts as using less surface water (*compared to what* is not specified) while also increasing the plant’s overall efficiency. WCP at 3. However, the Company’s proposed re-circulating water system is not the most efficient available. Technologies like dry and wet/dry-hybrid cooling are available and in use in the U.S. and abroad.¹⁵ Southern Company is well aware of this technology. In the Nuclear Regulatory Commission’s Environmental Impact Statement for the Vogtle Units 3 and 4 Early Site Permit, the agency found that the use of dry or wet/dry-hybrid cooling would dramatically decrease the environmental impacts the new reactors would have on the river. Based on this assessment, the NRC determined that a “dry or hybrid wet/dry cooling system could be a preferred option if a wet tower system would cause significant adverse impacts to water availability, water quality, or aquatic resources.” *Id.* While the NRC went on to conclude that the impacts would not be significant enough to require such a cooling system, this conclusion was reached in 2008, well before the Savannah Harbor Expansion Project was approved. With the expansion project now underway and the river’s DO levels all the more concerning, the Water Conservation Plan cannot simply reject a dry or wet/dry-hybrid cooling system out of hand.

Not only do these technologies significantly reduce water use compared to conventional cooling towers, but they can be cost-effective as well, especially during drought conditions that have caused power plant shutdowns across the region. By definition, droughts reduce water availability, especially during the peak summertime demand, making dry cooling or wet/dry-hybrid cooling technologies far more practical, as there simply may not be enough water available to run a conventional cooling system. Without the necessary water, plants could be forced to shut down. And even if there is enough water, drought can cause increased water temperatures, which alone can prevent conventional cooling and force reactor shut down.¹⁶

¹⁵ According to testimony by Mr. William Powers in the Vogtle Units 3 & 4 Early Site Permit evidentiary hearing, dry cooling is in common use at utility power plants in the United States and abroad. For example, Midlothian Energy uses a dry cooling system at its 1,650 MW combined cycle plant located near Dallas, Texas. Dry cooling has been used on a 330 MW coal-fired plant in Wyoming for over 30 years. And dry cooling has been used on a 4,000 MW coal-fired power plant in South Africa for over 15 years. See Prefiled Direct Testimony of William Powers in Support of EC 1.3, NRC Docket No. 52-011-ESP (February 2, 2009)(available through NRC’s Agencywide Documents Access and Management System (ADAMS) at accession number ML090330448). Currently, Dominion Virginia Power is planning to use a closed-cycle, combination dry and wet cooling tower system for its proposed new nuclear reactor at the North Anna site near Richmond in Louisa County, Virginia. See <http://pbadupws.nrc.gov/docs/ML1400/ML14007A643.pdf>. The innovative North Anna cooling system was described as “allow[ing] for operational flexibility during different times of the year to balance water conservation and energy use.” See EA Engineering, Science, and Technology, Inc. for Dominion Resource Services, *Instream Flow Incremental Methodology (IFIM) Studies on the North Anna and Pamunkey Rivers, Virginia*, Final Report, October 2009, p. ES-1. Available at https://www.dom.com/about/stations/nuclear/north-anna/pdf/instream_flow_study.pdf. A key benefit of this type of wet/dry-hybrid cooling is that it is extremely effective during long drought periods, which are anticipated to increase in frequency with climate change. This highlights the need for climate modeling before finalization of this permit (see Section IV.e).

¹⁶ In 2012, Millstone Power Station near New London, Connecticut, was shut down when temperatures in Long Island Sound, the source of the facility’s cooling water, reached their highest sustained levels since the facility began monitoring in 1971. See <http://news.nationalgeographic.com/news/energy/2012/08/120817-record-heat-drought-pose-problems-for-electric-power-grid>. In 2011, Tennessee Valley Authority’s Browns Ferry Nuclear reactor was shut down for the second time in a two-year span due to high temperatures in the Tennessee River. See <http://theenergycollective.com/jcwinnie/62883/brown-s-ferry-nuclear-power-plant-has-shut-down-again>.

The consideration of such alternative technologies is relevant to the long-range planning component of the Water Conservation Plan, required by EPD regulations. Ga. Comp. R. & Regs. r. 391-3-6-.07(4)(b)8(ix). The Company was required to “develop water demand projections covering a 20 year time period using a method or methods approved by the Director. The demand projections must reflect the effects (demand reductions) inherent in the implementation of new or enhanced water conservation programs.” *Id.*

In purported satisfaction of this requirement, Southern Company’s Water Conservation Plan states merely that “[t]he projected water supply and demand are expected to remain constant” before referencing its Drought Contingency Plan, which is a separate requirement of EPD’s Regulations. *See* Ga. Comp. R. & Regs. r. 391-3-6-.07(4)(b)9. This meager language utterly fails to comply with the long-range planning requirement. The Company is required to demonstrate how its Water Conservation Plan – including its “planned activities that contribute to water conservation” – will result in actual demand reductions.

The Company’s choice of cooling technology will contribute, more than any other measure, to the Plant’s water losses. The Company itself views this choice as a planned activity contributing to water conservation. Therefore, the Company must demonstrate how its selection of a re-circulating water system – versus other more advanced water-saving technologies – will result in demand reductions.

In addition, while the Company states that water conservation measures are “always under consideration,” it has identified “no specific additional water conservation measures.” WCP at 5. This reflects a lack of commitment to reduce consumptive losses that the large withdrawals authorized by the permit will cause. The draft permit is equally lax, requiring only that the Company “demonstrate *an effort* to increase water use efficiency,” a condition that is both vague and unenforceable. Draft Permit at Special Condition No. 8 (emphasis added).

For all of the above reasons, the Company’s Water Conservation Plan fails to meet the letter and spirit of EPD’s regulations requiring such plans. EPD should require the Company to prepare a revised plan that considers less consumptive technologies, demonstrates actual demand reductions, and identifies concrete additional water conservation measures. In addition, EPD should amend the draft permit to require the Company to achieve quantifiable demand reductions by dates certain.

d. The Drought Contingency Plan is Inadequate

The draft permit does little to assuage concerns about the impact the proposed withdrawals will have on the river during extreme droughts. By regulation and as a condition to the draft permit, Southern Company must “abide by applicable drought response requirements.” *See* Ga. Comp. R. & Regs. r. 391-3-6-.07(4)(b)9; Draft Permit at Special Condition 7. However, its Drought Contingency Plan (DCP) does not even consider an exceptional drought scenario (Drought Level 4). While the Company considers Drought Level 4 an “extremely rare event,” this supposedly exceptional drought scenario has impacted nearly half of Georgia and much of the southeastern United States in recent years, as EPD noted in its 2007 comments on the Draft EIS. EPD Comments at 2. With climate change, these types of extreme drought are likely to

become more common over the operational lives of the new units, which are projected to extend through 2060 or longer. Without including information and consideration of an exceptional drought, EPD cannot fully consider whether the requested withdrawal is reasonably necessary, nor can EPD determine whether the withdrawals will have unreasonably adverse effects on other users. *See* O.C.G.A. § 12-5-31(g).

Neither the draft permit nor the Company's Drought Contingency Plan contains any low flow requirements. The Company's description of its "low flow protection" plan assigns primary responsibility for maintaining flow protections to the Corps as the regulatory body with jurisdiction over three upstream federal reservoirs. DCP at 2. The Company states that the bottom of its cooling water intake structure pump bays are "well below the bottom of the intake canal" and "will provide adequate protection for the pumps during drought conditions." The Company then pledges to continue monitoring river elevation levels to ensure adequate river levels are available: "In the unlikely event that Savannah River flows became so low that [Plant Vogtle] could not safely operate, [the Company] would initiate reactors' shutdown." *Id.* at 3.

Conspicuously absent from the draft permit is any requirement that Southern Company actually conduct such monitoring or take any action to reduce withdrawals when flows begin to reach critical levels. There should be more than the Company's commitment to initiate shutdown when levels become so low that safe operation cannot be assured. EPD's regulations require more.

A Drought Contingency Plan must include, among other items, "a system for determining drought severity based on some approved indicator," such as streamflow levels, as well as a method for achieving low flow protection. Ga. Comp. R. & Regs. r. 391-3-6-.07(4)(b)9(i)(I) & (iii). EPD shall not issue a permit which "authorizes the depletion of instream flow." *Id.* at (4)(b)9(iii)(I). This low flow protection provision is the Water Quality Act's keystone requirement, providing the foundation for EPD's determination regarding whether the applicant's withdrawal of surface water will cause "unreasonable adverse effects" on other water users. To assure low flow protection, a permit applicant must furnish a "low-flow monitoring plan that outlines the applicant's procedure to monitor and protect instream flow below the point of withdrawal." The Company has furnished no such plan, and its application should have been rejected on this basis alone.

EPD should require Southern Company to furnish a low flow monitoring plan as required by the applicable regulations. Based on this plan, EPD should revise the permit to include express low flow requirements including specification of the flow levels at which the requirements become applicable.

e. EPD Should Require the Company to Conduct Climate Modeling and Incorporate Such Modeling Results into Its Long-Range Planning

As detailed in these comments, the withdrawals authorized by the draft permit will cause a number of negative impacts to the river. These impacts are likely to worsen over the operational lives of the new units as a result of climate change. The record underlying the draft permit is devoid of any consideration of how climate change may exacerbate the impacts of the proposed withdrawals on the river and aquatic species that depend upon it. Nor is there any consideration or discussion of how the effects of climate change, including more frequent and

intense droughts, could limit the plant's ability to safely operate. Southern Company's required long term planning should include climate change modeling. *See* Ga. Comp. R. & Regs. r. 391-3-6-.07(4)(b)8(ix). This information is relevant and important to EPD's consideration of whether the permit will have unreasonable adverse impacts on other users. *See* O.C.G.A. § 12-5-31(g).

The existing Vogtle reactors, Units 1 and 2, are currently licensed to operate until 2047 and 2049 respectively.¹⁷ The proposed Units 3 and 4 are licensed to operate for 40 years, with possible extensions of 20 years, such that they could operate for 60 or more years.¹⁸ With current projected commercial operation dates of 2017 and 2018 for Units 3 and 4, respectively, this could mean operation until 2077 and 2078, with all four reactors operating simultaneously for a substantial portion of that time. Plant Vogtle's burden on the Savannah River will thus extend long into the future, well beyond existing statewide water planning analyses such as the Georgia Statewide Energy Sector Water Demand Forecast, which evaluated Georgia's power-related water needs only through 2050.¹⁹

Climate change-induced sea level rise is likely to cause more severe saltwater intrusion into the river. The additional consumptive use from Vogtle Units 3 and 4 will reduce freshwater flows into the Savannah Harbor, exacerbating this problem. In addition, as river temperatures increase along with ambient air temperatures, DO levels will be negatively impacted, especially during times of drought. This will cause additional stress to aquatic species that depend on the river, including the threatened Atlantic sturgeon and endangered shortnose sturgeon.

Climate change is also likely to exacerbate the impact of the withdrawals on upstream and downstream users from multiple use sectors (industrial, municipal, recreational, etc.) by reducing water availability and increasing the degradation of water quality. This impact on other users must be considered by EPD. *See* O.C.G.A. § 12-5-31(g) (withdrawal permits "shall not have unreasonably adverse effects on other water users").

EPD should require Southern Company to perform climate modeling that evaluates the Savannah River's ability to cope with the long term impacts of the proposed withdrawals. As described in Section IV.c, there are cooling technologies that can operate more effectively during drought than the technology proposed by the Company. EPD should require the Company to prepare a revised Water Conservation Plan that considers less consumptive cooling technologies in light of the long term implications of climate change as determined through the climate modeling. This modeling should be completed and made public, and its results incorporated into the Company's long-range planning, before the draft permit is finalized.

¹⁷ *See* U.S. Nuclear Regulatory Commission (NRC), *List of Power Reactor Units*, available at <http://www.nrc.gov/reactors/operating/list-power-reactor-units.html>.

¹⁸ *See* U.S. NRC, *Combined License Applications for New Reactors*, available at <http://www.nrc.gov/reactors/new-reactors/col.html>.

¹⁹ *See* Technical Memo and Executive Summary of the Georgia Statewide Energy Sector Water Demand Forecast, October 29, 2010, is available at EPD's Georgia State Water Plan website: http://www.georgiawaterplanning.org/pages/forecasting/energy_water_use.php; Executive Summary available at http://www.georgiawaterplanning.org/documents/Energy_Forecast_ES_102910.pdf.

V. Conclusion

For all the above reasons, we ask EPD to withdraw the draft permit so that it may be considered within – rather than outside of – the ongoing regional discussions concerning the river’s future. Alternatively, before making a final determination on whether the permit will have unreasonable adverse effects, EPD should consider the permit’s impacts in conjunction with the corresponding required NPDES permit; support and expand the permit’s special condition requiring oxygen injection; and require a more robust and complete Water Conservation Plan and Drought Contingency Plan. EPD should require climate modeling, an assessment of impacts to endangered and threatened species, and implementation of monitoring stations to assess other impacts of the water withdrawal. Finally, before making a final determination on whether the permit is reasonably necessary to meet Southern Company’s needs, EPD should consider whether the AP1000 reactors at Units 3 and 4 require as much water to operate as currently authorized by the draft permit.

We appreciate the opportunity to submit these comments and look forward to expanding upon them at the public hearing.

Respectfully submitted,



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