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***VIA E-MAIL***

Sheila Holman  
North Carolina Department of Environmental Quality  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601  
publiccomments@ncdenr.gov

**Re: Cape Fear River Watch Comments on Chemours' Corrective Action Plan**

Dear Ms. Holman:

On behalf of Cape Fear River Watch, please accept these comments on Chemours' Corrective Action Plan ("plan") for the Fayetteville Works Facility. On December 31, 2019, Chemours submitted an 1800-page document that is intended to provide for the "restoration of groundwater quality" in accordance with state law. Although titled "Corrective Action Plan," Chemours' document fails to provide any action or plan to correct the unprecedented contamination the company has caused in violation of the 2019 Consent Order and state law.<sup>1</sup>

Rather than commit to clean up its historic contamination, Chemours seeks to do what it and DuPont have done for decades—escape responsibility for the harm caused by its chemicals. For years, DuPont and Chemours have known that the Washington Works Facility in West Virginia contaminated the air, groundwater, river, and drinking water near the facility. And yet neither DuPont nor Chemours did anything to prevent the same contamination at the Fayetteville Works Facility. Now, having been caught contaminating more than 70 square miles, hundreds of drinking water wells, and the river that provides water for more than 300,000 North Carolinians, Chemours makes an astonishing argument—that it should be excused from the clear requirements of the state's groundwater rules because the harm it has caused is too vast. Although the Cape Fear Public Utility Authority and Brunswick County have invested hundreds of millions of dollars to clean up Chemours' contamination, the company's plan asserts that it should be allowed to wait and further study its extensive contamination before taking action. While communities, schools, and churches near and far depend on bottled water because Chemours' pollution continues to taint their taps, the company asks for more time to allow it to escape responsibility.

DEQ must hold Chemours accountable. The company has now made it clear that it does not intend to uphold its commitments under the Consent Order or the requirements for corrective action under the state rules. DEQ must exercise its full authority under the Consent Order to

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<sup>1</sup> The Chemours Company FC, LLC, Corrective Action Plan – Chemours Fayetteville Works (Dec. 2019) ("CAP").

seek penalties for Chemours' violations of the order, reject Chemours' proposed Corrective Action Plan, and require the company to meet the groundwater rules' requirement to eliminate its contamination.

**I. Chemours must be held responsible.**

Chemours' rejection of responsibility for its pollution begins with its cover letter. The company states that any remaining problems should be DuPont's problem.<sup>2</sup> DEQ cannot allow Chemours to shirk its obligations. The Consent Order and state law do not free Chemours from its responsibility to clean up its pollution simply because DuPont formerly owned and operated the facility. If Chemours wishes to seek compensation from DuPont, as it has begun to in the Delaware Chancery Court, it is free to do so. Communities living near and downstream of Chemours' facility must not bear the burden of unresolved disputes between the two companies.<sup>3</sup>

**II. State law and the Consent Order require Chemours to clean up its site.**

Throughout Chemours' Corrective Action Plan, the company uses uncertainty or a lack of information to justify a failure to act. Because per- and polyfluoroalkyl substances ("PFAS") have not been studied enough, the company argues, it is not certain that there will be harms to human health and the environment; therefore, more protective cleanup should not be required. Chemours is wrong.

The Consent Order and state law are designed to ensure the maximum cleanup is completed, even in the face of uncertainty. The Consent Order requires *maximum* reductions in PFAS loading to surface waters to be implemented as soon as possible. In the long-term, the Consent Order incorporates North Carolina's stringent groundwater cleanup requirements, which mandate the cleanup of pollutants to the lowest levels that are measurable by a laboratory, or as close to those levels as are technologically and economically feasible. As a backstop, the Consent Order requires that PFAS loading to the Cape Fear River, and each stream that flows into it, be reduced by 75 percent *at a minimum*. State water quality standards, which are incorporated into the state groundwater rules, prohibit discharges of PFAS unless the company can demonstrate they are safe. In failing to apply these standards, Chemours ignores its commitments under the Consent Order and those under state law, rendering their Corrective Action Plan non-compliant.

**A. State law requires that Chemours clean up its pollution to groundwater standards, or as close as is economically and technologically feasible.**

State law mandates the comprehensive cleanup of contaminated groundwater. First, when groundwater contamination has been discovered, the entity responsible must act immediately—even before investigating the scope of the contamination and before developing a corrective action plan. It must "take action upon discovery to terminate and control the

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<sup>2</sup> Letter from Brian D. Long, Chemours, to Sheila Holman, N.C. Department of Environmental Quality ("DEQ"), "Corrective Action Plan – Chemours Fayetteville Works," Dec. 31, 2019, \*1.

<sup>3</sup> This is particularly true here, where the facility simply changed signs—continuing to employ the same persons responsible for the practices leading to the unprecedented contamination.

discharge,” and “mitigate any hazards resulting from exposure to the pollutants.”<sup>4</sup> The entity responsible must abate, contain, and control the migration of the contaminants; remove, treat, control primary pollution sources; and remove, treat, and control secondary pollution sources that continue to pollute groundwater, including contaminated soils.<sup>5</sup>

Then, the entity responsible must assess the contamination,<sup>6</sup> and develop a corrective action plan that includes: “[s]pecific plans, including engineering details where applicable, for restoring groundwater quality;” “a schedule for the implementation and operation of the proposed plan;” and “a monitoring plan for evaluating the effectiveness of the proposed corrective action and the movement of the contaminant plume.”<sup>7</sup>

The state groundwater rules require that “[w]here groundwater quality has been degraded, *the goal of any required corrective action shall be restoration to the level of the standards, or as closely thereto as is economically and technologically feasible* as determined by the Department in accordance with this Rule.”<sup>8</sup> Pollutants “which are not naturally occurring and for which no standard is specified,” like PFAS, “shall not be permitted in concentrations at or above the practical quantitation limit,”<sup>9</sup> or the “lowest concentration of a given material that can be reliably achieved among laboratories within specified limits of precision and accuracy by a given analytical method during routine laboratory analysis.”<sup>10</sup> The rules also require that corrective action plans “be implemented using a remedial technology demonstrated to provide *the most effective means*, taking into consideration geological and hydrogeological conditions at the contaminated site, for restoration of groundwater quality to the level of standards.”<sup>11</sup>

State law thus requires that Chemours begin to contain and control its PFAS groundwater pollution immediately after discovering it; remove, treat, and control all of the sources that contribute to its groundwater pollution, including contaminated soil; and then clean up its groundwater pollution to the lowest concentration level that is measurable by laboratories, or *as close to that level as possible*—and that the company’s corrective action plan reflect these actions and goals.

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<sup>4</sup> 15A N.C. Admin. Code 2L .0106(b).

<sup>5</sup> 15A N.C. Admin. Code 2L .0106(f).

<sup>6</sup> 15A N.C. Admin. Code 2L .0106(c), (g).

<sup>7</sup> 15A N.C. Admin. Code 2L .0106(h). Due to the inadequacy of Chemours’ submission, Cape Fear River Watch has not commented on the company’s proposed monitoring plan. Cape Fear River Watch reserves the right to comment on a future monitoring plan submitted as part of a corrective action plan that complies with the Consent Order and state groundwater rules. Just as Chemours’ Corrective Action Plan is wholly inadequate, so too is its monitoring plan.

<sup>8</sup> 15A N.C. Admin. Code 2L .0106(a) (emphasis added).

<sup>9</sup> 15A N.C. Admin. Code 02L .0202(c).

<sup>10</sup> 15A N.C. Admin. Code 02L .0102(15).

<sup>11</sup> 15A N.C. Admin. Code 02L .0106(j) (emphasis added).

- B. The Consent Order requires that Chemours achieve maximum reductions from groundwater to rivers and streams within two years, and that Chemours reduce PFAS loading to all rivers and streams by *at least 75 percent*.

The Consent Order requires that Chemours clean up and control its contaminated groundwater in two stages. Paragraph 12 provides for more immediate implementation of groundwater control measures at the site, whereas paragraph 16 requires the company to conduct long-term cleanup, incorporating the stringent requirements of state law.

Under paragraph 12 of the Consent Order, Chemours must:

submit to DEQ and Cape Fear River Watch a plan demonstrating the *maximum reductions in PFAS loading from the Facility* (including loading from contaminated stormwater, non-process wastewater, and groundwater) to surface waters, including Old Outfall 002, that are economically and technologically feasible, and can be achieved within a two-year period (“PFAS reduction targets”). The plan shall be supported by interim benchmarks to ensure continuous progress in reduction of PFAS loading. If significantly greater reductions can be achieved in a longer implementation period, Chemours may propose, in addition, an implementation period of up to five years supported by interim benchmarks to ensure continuous progress in reduction of PFAS loading.<sup>12</sup>

Under this provision, Chemours was required to submit a plan by August 2019 that demonstrated maximum reductions in PFAS loading from groundwater to surface waters that are feasible, and that could be achieved within two years.

In addition to the short-term implementation of controls required under Consent Order paragraph 12, paragraph 16 requires the company to submit a “complete Corrective Action Plan that complies with the requirements of the 2L Rules.”<sup>13</sup> These rules require that the company clean up its PFAS groundwater pollution to almost undetectable levels (i.e., the “practical quantitation limit”).

As a backstop to the rules, paragraph 16 of the Consent Order mandates that “[a]t *minimum*, the Corrective Action Plan must require Chemours to reduce the PFAS loading to surface water (Old Outfall 002, Willis Creek, Georgia Branch, and the Cape Fear River), for the PFAS for which test methods and lab standards have been developed, by at least 75% from baseline.”<sup>14</sup> So that those reductions can be measured, the Consent Order requires that Chemours install groundwater monitoring wells along each surface water near the facility (Old Outfall 002, Willis Creek, Georgia Branch, and the Cape Fear River).<sup>15</sup>

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<sup>12</sup> Consent Order, N.C. Dept. of Environmental Quality v. Chemours, 17 CVS 580, 14-15 (N.C. Super. 2019) (“Consent Order”).

<sup>13</sup> Consent Order at 21.

<sup>14</sup> *Id.* at 22 (emphasis added).

<sup>15</sup> *Id.* at 22.

Taken together, the goal of the Corrective Action Plan, as dictated by paragraph 16 of the Consent Order, is Chemours' cleanup of all PFAS to as close to the practical quantitation limits as is economically and technologically feasible; and, *at a minimum*, reduction of PFAS loading to Old Outfall 002, to Willis Creek, to Georgia Branch, and to the Cape Fear River by 75 percent for all PFAS.

Despite these requirements, Chemours sent DEQ and Cape Fear River Watch a letter on October 7, 2019, admitting that its August 2019 submission required by paragraph 12 of the Consent Order did not address on-site groundwater, as required.<sup>16</sup> Chemours' letter stated that "addressing on-site groundwater will be a major focus of the Corrective Action Plan due in December" and proposed to "merge the paragraph 12 and 16 requirements."<sup>17</sup> The company went on to promise that it would address groundwater loading to the Cape Fear River *and other surface waters* in its Corrective Action Plan:

Under this approach, Chemours would be obligated to propose in the Corrective Action Plan those feasible measures that would achieve maximum reductions in loadings to surface waters from on-site groundwater in two and five year periods. This would include consideration of measures that could impact not just loadings from on-site groundwater to the Cape Fear River, but to other surface waters as well.<sup>18</sup>

As discussed below, Chemours did not do any of this in its Corrective Action Plan.

### **III. Chemours applied the wrong standard and ignored its obligations under state law and the Consent Order.**

Chemours' Corrective Action Plan could hardly do less to meet the clear state law and Consent Order mandates set out above. Instead, the company brazenly attempts to rewrite the law and the Consent Order in order to propose so-called "actions"—actions that cost the company little, and that will leave 45,000 acres of toxic groundwater sitting beneath people's homes, and spilling into the Cape Fear River and streams for the foreseeable future.

#### **A. The Corrective Action Plan will not meet groundwater standards and Chemours does not qualify for an exemption.**

Instead of developing a Corrective Action Plan that complies with state groundwater laws, or the Consent Order, Chemours argues that DEQ should instead exempt Chemours from the requirements of state groundwater standards. Chemours argues that it should be released

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<sup>16</sup> Letter from Joel M. Gross to Francisco Benzoni and Geoff Gisler, "Chemours' PFAS Loading Reduction Plan," Oct. 7, 2019, included as Attachment 1. DEQ and Cape Fear River Watch have demanded compliance from the company. Letter from Francisco Benzoni and Geoff Gisler to Joel Gross, "Chemours' PFAS Loading Reduction Plan," Sept. 26, 2019, included as Attachment 2; Letter from Francisco Benzoni and Geoff Gisler to Joel Gross, "PFAS Loading Reduction Plan," Oct. 23, 2019, included as Attachment 3.

<sup>17</sup> Letter from Joel M. Gross to Francisco Benzoni and Geoff Gisler, "Chemours' PFAS Loading Reduction Plan," 2-3, Oct. 7, 2019. Note that Cape Fear River Watch and DEQ did not agree to merge the Paragraph 12 and 16 requirements as Chemours proposed.

<sup>18</sup> *Id.* at 3.

from state standards *because* of the historic extent of its contamination, and that it would be too costly to clean it up in compliance with the law. Putting Chemours' attempts to avoid responsibility aside, the company does not qualify for any exemption, its Corrective Action Plan does not meet the required standards, and DEQ must reject the company's plan.

1. *Chemours does not qualify for an exemption from state groundwater standards.*

Chemours asks DEQ to exempt the company from the state's groundwater rules under 15A N.C. Admin. Code 2L .0106(k). For that narrow exemption to apply, however, DEQ must find, based on Chemours' demonstration, that *all* of the following elements are true:

- Chemours must have already removed or controlled “*all sources of contamination and free product*”<sup>19</sup>—including “buried waste, waste stockpiles, or surficial accumulations of free products;”<sup>20</sup> as well as all “secondary pollution sources that would be potential continuing sources of pollutants to the groundwaters, such as contaminated soils and non-aqueous phase liquids.”<sup>21</sup>
- “[T]he time and direction of contaminant travel can be predicted with reasonable certainty.”<sup>22</sup>
- “[C]ontaminants have not and will not migrate onto adjacent properties, or that: (A) such properties are served by an existing public water supply system dependent on surface waters or hydraulically isolated groundwater; or (B) the owners of such properties have consented in writing to the request.”<sup>23</sup>
- Groundwater standards “will be met at a location no closer than one year time of travel upgradient of an existing or foreseeable receptor, based on travel time and the natural attenuation capacity of subsurface materials or on a physical barrier to groundwater migration that exists or will be installed by the person making the request.”<sup>24</sup>
- Because “the contaminant plume is expected to intercept surface waters,” the groundwater discharge cannot “possess contaminant concentrations that would result in violations of standards for surface waters contained in 15A NCAC 02B .0200.”<sup>25</sup>
- Public notice of the request has been provided.<sup>26</sup>

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<sup>19</sup> 15A N.C. Admin. Code 2L .0106(k) (emphasis added).

<sup>20</sup> 15A N.C. Admin. Code 2L .0106(f)(3).

<sup>21</sup> 15A N.C. Admin. Code 2L .0106(f)(4).

<sup>22</sup> 15A N.C. Admin. Code 2L .0106(k)(2).

<sup>23</sup> 15A N.C. Admin. Code 2L .0106(k)(3).

<sup>24</sup> 15A N.C. Admin. Code 2L .0106(k)(4).

<sup>25</sup> 15A N.C. Admin. Code 2L .0106(k)(5).

<sup>26</sup> 15A N.C. Admin. Code 2L .0106(k)(6).

- The proposed corrective action plan would be consistent with all other environmental laws.<sup>27</sup>

Chemours has not shown, and cannot show, that all of these circumstances exist.

***Chemours has not come close to removing or controlling all sources of groundwater contamination.***<sup>28</sup> Chemours’ facility has released PFAS into the air, water, and soil for over four decades. As a result, there are numerous sources of contamination that continue to leach PFAS into the groundwater below. For instance, there are PFAS in soils caused by the deposition of Chemours’ air emissions—contamination that remains in soil on-site and off-site.<sup>29</sup>

Areas at the site have also been polluted by the company’s highly toxic process wastewater and other media.<sup>30</sup> For decades, PFAS-contaminated wastewater and stormwater traveled throughout the facility.<sup>31</sup> PFAS clung to soils and sludge, leaked continuously into groundwater, and flushed throughout the site when it rained.<sup>32</sup> The company did nothing to contain that contamination.

Polluted solid waste and sludge from the facility’s wastewater treatment plant and from sedimentation basins were dumped in unlined pits and lagoons around the site.<sup>33</sup> Because Chemours has not fully excavated that waste, PFAS will continue to leach into groundwater.<sup>34</sup> In fact, Chemours outright refuses to conduct such remediation in its plan, stating that although “2L requires removal or control of secondary sources to groundwater such as contaminated soils,” it would not remove those sources because “soil remediation would have reduced benefit.”<sup>35</sup>

Sampling at the facility required under paragraph 11 of the Consent Order confirms continuing sources of contamination to groundwater. One sampling location had PFAS

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<sup>27</sup> 15A N.C. Admin. Code 2L .0106(k)(7).

<sup>28</sup> 15A N.C. Admin. Code 2L .0106(k)(1).

<sup>29</sup> CAP at 19 (describing the “[i]nfiltrating rainfall [that] has transported these PFAS downward to groundwater.”).

<sup>30</sup> CAP at 23-24. This has also been documented by all of Chemours’ submissions since its pollution was uncovered in 2017.

<sup>31</sup> See Attachment 3 of The Chemours Company FC, LLC, Cape Fear River PFAS Loading Reduction Plan, 24, 26 (Aug. 2019).

<sup>32</sup> *Id.*

<sup>33</sup> Phase III Resource Conservation and Recovery Act Facility Investigation Report for DuPont Fayetteville Works, Appendix D, SWMU 9, 16 (2014). Given that the historical waste was produced long before Chemours began capturing its PFAS process wastewater, it is likely that the waste contains high concentrations of PFAS and is a continuing source of contamination to groundwater.

<sup>34</sup> Note that there is also a rainwater retention basin north of the PPA Manufacturing area that is a known source of PFAS into groundwater that Chemours has not yet investigated. Phase III Resource Conservation and Recovery Act Facility Investigation Report for DuPont Fayetteville Works, Appendix D, SWMU 7 (2014) (“Evidence of a release was identified in the vicinity of the former rain water retention basin north of the PFOA manufacturing facility and a second, similar release occurred on June 23, 2011 from the PPA stack in this same area. PFOA has been identified in shallow groundwater as a result of air deposition in the immediate vicinity of the PFOA manufacturing area being carried via runoff and infiltrating into the subsurface.” PFOA is a type of PFAS.).

<sup>35</sup> CAP at 55 (emphasis added).

concentrations of 48,000 parts per trillion (“ppt”),<sup>36</sup> potentially caused by a leaking terracotta pipe which Chemours says will not be remedied for another year.<sup>37</sup> Stormwater in its Nafion Manufacturing area has been measured at concentrations up to 66,000 ppt,<sup>38</sup> yet Chemours does not currently have a plan in place to control its stormwater. The wastewater treatment plant discharge has been measured at 36,000 ppt.<sup>39</sup> Many channels around the facility that receive wastewater treatment plant discharge and flow from the contaminated Nafion Manufacturing area are unlined or leaking, allowing PFAS to seep into the groundwater below.<sup>40</sup> The company’s own analysis demonstrates that Chemours has not removed or controlled *all* sources of contamination to groundwater, and does not meet the first and crucial requirement of 15A N.C. Admin. Code 2L .0106(k).

***Chemours cannot predict the time and direction of contaminant travel with reasonable certainty.***<sup>41</sup> Chemours relies on “retardation factors” to predict contaminant travel, yet has only produced such information for five PFAS.<sup>42</sup> The company’s own fate and transport study only addresses 24 PFAS.<sup>43</sup> The company’s analysis thus only covers a fraction of the pollutants in Chemours’ groundwater. The company has identified an additional 22 PFAS from non-targeted sampling that are not addressed in its fate and transport study,<sup>44</sup> and Chemours has admitted that there are over 150 PFAS that could be present at the facility.<sup>45</sup> Even for those covered by the company’s study, Chemours acknowledges that it cannot predict their fate with any certainty.<sup>46</sup>

***Chemours cannot demonstrate that its “contaminants have not and will not migrate onto adjacent properties.”***<sup>47</sup> Chemours’ PFAS have migrated onto nearby properties. They have been found in over 1,900 wells that provide drinking water to surrounding residents,<sup>48</sup> and Chemours cannot ensure that its PFAS-contaminated groundwater will not continue to migrate further onto other properties.<sup>49</sup> The company also cannot demonstrate that “such properties are

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<sup>36</sup> The Chemours Company FC, LLC, PFAS Characterization Quarterly Report, Figure 3B (Jan. 2020) (“Chemours Jan. 2020 Characterization Report”).

<sup>37</sup> CAP at 18-19.

<sup>38</sup> Chemours Jan. 2020 Characterization Report at Figure 3B.

<sup>39</sup> *Id.*

<sup>40</sup> See Attachment 3 of The Chemours Company FC, LLC, Cape Fear River PFAS Loading Reduction Plan, (Aug. 2019).

<sup>41</sup> 15A N.C. Admin. Code 2L .0106(k)(2).

<sup>42</sup> CAP at 27, 58-59.

<sup>43</sup> The Chemours Company FC, LLC., Site Associated PFAS Fate and Transport Study Chemours Fayetteville Works, 3 (June 2019) (“Fate and Transport Study”).

<sup>44</sup> Fate and Transport Study at 3.

<sup>45</sup> The Chemours Company FC, LLC., Chemours Fayetteville Works NPDES Permit Application Update, Attachment F-4, “List of PFAS Compounds” (July 2019). (“This list represents the known PFAS compounds that could be present at Chemours – Fayetteville Works and therefore potentially detected in the effluent from the facility.”).

<sup>46</sup> Fate and Transport Study at 15 (“Site [a]ssociated PFAS have limited publicly available, peer-reviewed literature describing their fate and transport.”).

<sup>47</sup> 15A N.C. Admin. Code 2L .0106(k)(3).

<sup>48</sup> The Chemours Company FC, LLC., Consent Order Progress Report for Fourth Quarter 2019, \*1.

<sup>49</sup> DEQ guidance requires that a map “be provided that shows the current plume boundary as well as adjacent properties and those down gradient properties where the plume is expected to migrate. Any supply wells on those properties must be located on the map. An indication of which properties are predicted to be impacted and the technical basis for this determination must also be provided. In addition, a map must be provided that shows the predicted maximum extent of the contamination plume.” DEQ – Division of Water Resources, Guidelines for the



served by an existing public water supply system dependent on surface waters or hydraulically isolated groundwater;” or that “the owners of such properties have consented in writing to the request.”<sup>50</sup> Hundreds of affected properties are not served by existing public water supplies,<sup>51</sup> and the property owners have not consented in writing to Chemours’ pollution being on their property.

***Chemours cannot show that groundwater standards will be met upgradient of existing or foreseeable receptors.*** 15A N.C. Admin. Code 2L .0106(k)(4) requires that groundwater standards will “be met at a location no closer than one year time of travel upgradient of an existing or foreseeable receptor, based on travel time and the natural attenuation capacity of subsurface materials or on a physical barrier to groundwater migration that exists or will be installed by the person making the request.”<sup>52</sup> Groundwater upgradient of anyone who might be exposed to the company’s contamination, and other potential receptors,<sup>53</sup> will not meet practical quantitation limits for PFAS—Chemours admits as much.<sup>54</sup> Chemours has also not shown that there is any physical barrier to groundwater migration, nor has the company proposed to install a physical barrier to prevent that migration.

***Chemours cannot demonstrate that its PFAS groundwater discharge will not cause violations of standards in surface waters.***<sup>55</sup> Applicable surface water standards include the North Carolina Toxics Substances Standard, which requires that: “[T]he concentration of toxic substances [...] in surface waters shall not render waters injurious to [...] public health, or impair the waters for any designated uses,”<sup>56</sup> as well as the Class C water quality standard: 15A N.C. Admin. Code 02B .0211(12), which requires that wastes “shall not render waters injurious to public health, secondary recreation, or to aquatic life and wildlife, [...] or impair the waters for any designated uses.” To meet these standards, Chemours must demonstrate that it is not harmful to public health to continue to expose the public to the PFAS that it has subjected hundreds of thousands of people for decades. The company has not even considered such a study. Lack of information cannot be a basis to excuse Chemours from taking responsibility for its actions; it must instead be a bar to demonstrating compliance with applicable water quality standards. Therefore, Chemours cannot demonstrate compliance with either the North

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Investigation and Remediation of Soil and Groundwater Contamination, 27 (2017). Chemours has not satisfied these requirements.

<sup>50</sup> 15A N.C. Admin. Code 2L .0106(k)(3).

<sup>51</sup> Chemours has not finished installing filters, or providing alternative drinking supplies for everyone with a contaminated well. It has not even finished sampling wells. So the company cannot claim that properties are effectively served by an uncontaminated drinking water supply. DEQ guidance states that “[s]uitable water supplies must meet the regulatory definition of a public water supply and be approved by the DWR Public Water Supply Section,” and that documentation must be provided. *Id.*

<sup>52</sup> 15A N.C. Admin. Code 2L .0106(k)(4).

<sup>53</sup> DEQ guidance interprets “receptors” broadly to include “utility lines, public and domestic water supply wells, surface waters, and regions of groundwater that have been identified for planned resource development by state or local governments.” *Id.* at 27-28. In addition, DEQ guidance requires that “[a]ll existing and foreseeable receptors” “be identified on the base map.” *Id.* at 27.

<sup>54</sup> Chemours unilaterally concludes, without providing evidence, that meeting practical quantitation limits would not be feasible, and argues for “alternate cleanup standards.” *See* CAP at 51-60.

<sup>55</sup> 15A N.C. Admin. Code 2L .0106(k)(5).

<sup>56</sup> 15A N.C. Admin. Code 02B .0208.

Carolina Toxic Substances Standard or the Class C water quality standard, 15A N.C. Admin. Code 02B .0211(12).

Because Chemours fails to satisfy the requirements for 15A N.C. Admin. Code 2L .0106(k)'s exemption to the groundwater rules, the company must clean up its groundwater to practical quantitation limits, or as close as is technologically and economically feasible.

2. *The Corrective Action Plan does not attempt to, and will not, meet groundwater standards.*

Chemours admits that the Corrective Action Plan will not clean up groundwater to practical quantitation limits—the applicable standard for PFAS. The company also does not propose remediation that comes as close to practical quantitation limits is technologically and economically feasible, as state law requires.

Instead, Chemours unilaterally decides that achieving practical quantitation limits is infeasible without providing any evidence.<sup>57</sup> That omission alone is sufficient reason to reject the plan. Feasibility under state law is determined by DEQ, not by Chemours.<sup>58</sup> Therefore, Chemours must provide DEQ with sufficient supporting documentation so that the agency can make the determination as to what actions are economically and technologically feasible. It has not.

Even if Chemours were able to prove to DEQ's satisfaction that achieving practical quantitation limits is not economically feasible or technologically feasible, state law requires that Chemours come as close as possible to that standard—and that its Corrective Action Plan reflects that goal.<sup>59</sup> The plan, however, does not even consider methods to meet this mandatory standard. The only action Chemours proposes to take to clean up its on-site groundwater is to pump water from a handful of existing wells at a rate of 14 gallons per minute, after admitting that pumping at such a low rate would not meaningfully reduce the contamination.<sup>60</sup>

Despite admitting that the “most effective means” to stop groundwater from flowing into surface water is to install a barrier wall,<sup>61</sup> the company argues that the technology is not available

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<sup>57</sup> Chemours makes broad sweeping statements about how it could not possibly meet groundwater standards without providing any evidence or supporting documentation for those statements. For instance, the company states that any remedy which “could help make progress towards PQLs over this area would cost in the billions to tens of billions of dollars.” CAP at 56. It claims that a pump and treat system “with the goal of restoring groundwater to PQLs would cost an economically infeasible amount of over a billion dollars and would almost certainly not achieve PQLs and not achieve any additional benefit in loading reductions to the Cape Fear River greater than those already proposed in this CAP.” CAP at 57. It adds that “[E]x situ treatment will become asymptotic and not achieve cleanup goals.” CAP at 57. None of these broad, conclusory statements are supported by evidence.

<sup>58</sup> State law requires that Chemours restore all contaminated groundwater to the level of standards, “or as closely thereto as is economically and technologically feasible *as determined by the Department.*” 15A N.C. Admin. Code 2L .0106(a) (emphasis added).

<sup>59</sup> 15A N.C. Admin. Code 2L .0106(a).

<sup>60</sup> The Chemours Company FC, LLC, Memorandum, “Response to Cape Fear River Watch Comments Dated December 19, 2019,” Jan. 31, 2020, at 11. (Chemours states that pumping at 70 gallons per minute would not “meaningfully reduce loadings to the Cape Fear River.”).

<sup>61</sup> CAP at xvii.

to remedy the problem. The company's long-term goal—to wait-and-see what “remedial approaches” become available—is unacceptable.<sup>62</sup> First, the law is clear: it requires that the company come as close to practical quantitation limits as is feasible. Second, state groundwater rules contemplate the development of new technology, but they do not allow a polluter to delay cleanup. The rules state that if DEQ determines that a new technology is available at some point in the future “that would remediate the contaminated groundwater to the standards...,” DEQ “may require the responsible party to evaluate the economic and technological feasibility of implementing the new technology in *an active* groundwater corrective action plan.”<sup>63</sup> Chemours must act now. If new technology is developed, DEQ may determine whether or not that technology would be effective and require Chemours to evaluate it. Finally, effective technology exists. The company admits that there is an effective way to prevent groundwater from leaving the site, but is simply reluctant to pay for it.<sup>64</sup>

Similarly, the company argues that DEQ should wait-and-see what groundwater cleanup standards are developed in the future, rather than developing a plan that attempts to achieve practical quantitation limits.<sup>65</sup> State groundwater rules specifically provide for situations in which the groundwater cleanup standards have not been provided, and prioritize maximum cleanup in the face of uncertainty.<sup>66</sup> To wait for groundwater standards to be developed before implementing a Corrective Action Plan that comes as close as possible to achieving practical quantitation limits would be rewriting the law and excuse historic levels of groundwater contamination.

3. *DEQ must reject Chemours' false and self-motivated claims that its pollution will not harm communities and the environment.*

Chemours argues that its toxic PFAS contamination is not harming people or the environment, and therefore “hypothetical remedies” that would clean up its pollution “are not considered necessary.”<sup>67</sup> At the outset, this is not the applicable standard, as discussed above. Moreover, the company's exposure assessments are fundamentally flawed. In arguing that its groundwater does not need to be cleaned up, Chemours relies only on existing human health data for GenX—one out of dozens of PFAS released by the facility.<sup>68</sup> Chemours' ecological

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<sup>62</sup> CAP at 54; *see also* CAP at 51.

<sup>63</sup> 15A N.C. Admin. Code 2L .0106(o).

<sup>64</sup> CAP at xvii. (“It is not presently possible to conclude with confidence whether this alternative is economically feasible”).

<sup>65</sup> CAP at 51.

<sup>66</sup> 15A N.C. Admin. Code 02L .0202(c); 15A N.C. Admin. Code 02L .0102(15).

<sup>67</sup> CAP at 56. Chemours impermissibly uses this as a cleanup goal. It states that its cleanup goal for off-site groundwater is to “maintain human exposures to HFPO-DA below the North Carolina Department of Health and Human Services (NCDHHS) reference dose (achieved per HH-SLEA results and replacement drinking water actions).” CAP at 54.

<sup>68</sup> CAP, Appendix F – Offsite Human Health Screening Level Exposure Assessment (SLEA) of Table 3+ PFAS, at 35 (“The hazard characterization is limited to an assessment of HFPO-DA based on the current availability of toxicity criteria.”). Because Chemours' assessment is limited to GenX, or HFPO-DA, its conclusions regarding harm to human health must be limited to GenX. *See id.* at 50 (“[B]ased on the provisional hazard characterization, HFPO-DA does not pose a human health hazard...Under current conditions, no human health hazards *from* HFPO-DA were identified for consumptive use of untreated surface water from the Bladen and Kings Bluffs public supply intake points...In summary, the SLEA demonstrates that *current concentrations of HDPO-DA* in the environment in the

assessment is similarly unsupported by data.<sup>69</sup> In addition to Table 3+ PFAS and GenX, Chemours has identified an additional 22 PFAS from non-targeted sampling that are not addressed in the assessment,<sup>70</sup> and Chemours has admitted that there over 150 PFAS that could be present at the facility.<sup>71</sup>

Furthermore, recent retesting of 2014 and 2015 samples downstream of Chemours facility revealed that people have been drinking water with PFAS concentrations that are far higher than previously suspected, including high levels of PFAS *other than GenX*, such as PFMOAA, PFO<sub>2</sub>HxA and PFO<sub>3</sub>OA. A 2014 sample below Chemours' outfall had PFAS concentrations of about 990,000 ppt.<sup>72</sup> Another sample near the drinking water intake for people in Wilmington and Brunswick County had PFAS concentrations of 130,000 ppt.<sup>73</sup> Detlef Knappe, the N.C. State University scientist conducting the sampling, stated that these high concentrations are the "current best estimate of what people in the Wilmington area were drinking for [...] 37 years."<sup>74</sup> Focused only on GenX, Chemours' assessment, therefore, barely begins to cover the breadth of its PFAS pollution, and the devastating impact it has had, and will continue to have, on people nearby and downstream.<sup>75</sup>

Despite knowing that it has exposed hundreds of thousands of people to dozens of other PFAS at high levels, Chemours justifies its failure to fully evaluate other PFAS—and to clean up its groundwater—on a lack of information. The company states that "the lack of toxicity information for other Table 3+ PFAS also introduces uncertainty to the [Human Health Screening Level Exposure Assessment] but data are not available to evaluate the potential effect, if any, on the conclusions hazard characterization."<sup>76</sup>

For years, Chemours profited due to the public and the agency's lack of knowledge about these chemicals. By relying on a human health assessment that is supported by insufficient data in order to claim that no one will be harmed, Chemours again attempts to profit over the lack of information about PFAS. Chemours again attempts to put the burden of uncertainty on communities that have already suffered for decades from the company's actions.

Fortunately, the law places the risk of uncertainty on Chemours. There is a reason that unnatural, poorly studied chemicals are not permitted in groundwater. State law could not be clearer on how to deal with uncertainty regarding a chemical's toxicity: if there is no standard,

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vicinity of the Facility are unlikely to pose a hazard to human health, even in the absence of groundwater treatment.").

<sup>69</sup> CAP at 42. ("[T]his analysis was unable to assess hazards to exposed receptors for Table 3+ PFAS other than HFPO-DA").

<sup>70</sup> Fate and Transport Study at 3.

<sup>71</sup> The Chemours Company FC, LLC, Chemours Fayetteville Works NPDES Permit Application Update, Attachment F-4, "List of PFAS Compounds" (July 2019).

<sup>72</sup> Adam Wagner, *NC State-led study shows Cape Fear River had 'incredibly high' levels of chemicals*, THE NEWS&OBSERVER, Oct. 10, 2019, available at <https://www.newsobserver.com/article235963052.html> (last visited Feb. 25, 2020).

<sup>73</sup> *Id.*

<sup>74</sup> *Id.*

<sup>75</sup> For the same reason, the "Potential Future Risk-Based Remediation" proposed by Chemours in the company's plan is also inappropriate in this situation. See CAP at 60.

<sup>76</sup> CAP at 40.

the chemical must be removed. DEQ's decision here is not difficult. Chemours has decided to submit a corrective action plan that does not attempt to comply with the law. The company's plan must be rejected.

B. Chemours' plan does not comply with the Consent Order and DEQ should impose penalties.

As discussed in Section II(B) of these comments, Chemours has violated the groundwater remediation requirements under paragraph 12 of the Consent Order since August 26, 2019. Chemours' Corrective Action Plan also violates paragraph 16 of the Consent Order. Paragraph 16 of the Consent Order requires, at a minimum, a 75 percent reduction in PFAS loading to *each* surface water near the plant: Old Outfall 002, Willis Creek, Georgia Branch Creek, and the Cape Fear River.<sup>77</sup> So that those reductions can be measured, the Consent Order requires that Chemours install groundwater monitoring wells along *each* surface water near the facility (Old Outfall 002, Willis Creek, Georgia Branch, and the Cape Fear River).<sup>78</sup>

In addition to the base failures of the company's plan, Chemours attempts to unilaterally rewrite the Consent Order by limiting its cleanup goal is to reduce PFAS loading *only* to the Cape Fear River by 75 percent—thereby ignoring groundwater flow to all other surface waters.<sup>79</sup> This is a blatant violation of the Consent Order. DEQ must reject the Corrective Action Plan, require full compliance with the Order, and impose penalties on the company.

IV. State law demands action.

DEQ must discard Chemours' plan and require maximum cleanup of the company's groundwater. In evaluating the company's Corrective Action Plan, state law requires that DEQ consider “the extent of any violations, the extent of any threat to human health or safety, the extent of damage or potential adverse impact to the environment, technology available to accomplish restoration, the potential for degradation of the contaminants in the environment, the time and costs estimated to achieve groundwater quality restoration, and the public and economic benefits to be derived from groundwater quality restoration.”<sup>80</sup> Each of these factors warrants DEQ's rejection of Chemours' current plan, and mandates that Chemours do more.

***Chemours' violations are extensive.*** As stated in DEQ's complaint against Chemours, filed in the Bladen County Superior Court, Chemours has committed extensive violations.<sup>81</sup> The company knew that it was dumping PFAS into surface waters, including drinking water supplies; it repeatedly misled DEQ about its manufacturing processes, discharges, and the harmfulness of GenX; it violated state groundwater rules; and it violated its National Pollutant Discharge Elimination System permit and state water quality laws, and discharged without a permit.<sup>82</sup>

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<sup>77</sup> Consent Order at 22

<sup>78</sup> *Id.* at 21-22.

<sup>79</sup> CAP at 51. (“The Cape Fear River receives discharge from Old Outfall 002, Willis Creek and Georgia Branch Creek, onsite seeps and onsite groundwater. Therefore, reducing Cape Fear River PFAS mass loading by at least 75% was established as the cleanup goal.”).

<sup>80</sup> 15A N.C. Admin. Code 2L .0106(i).

<sup>81</sup> Amended Complaint, N.C. Dept. of Environmental Quality v. Chemours, 17 CVS 580 (N.C. Super. 2018).

<sup>82</sup> *Id.*

***Chemours’ pollution has caused extensive damage, and continues to threaten human health and public safety.*** Chemours’ violations are especially concerning because DEQ, the Environmental Protection Agency, other agencies, and other states acknowledge the serious threats to human health and safety posed by PFAS contamination. Two of the most commonly studied PFAS—perfluorooctanoic acid (“PFOA”) and perfluorooctane sulfonate (“PFOS”)—have been found to cause developmental effects to fetuses and infants, kidney and testicular cancer, liver malfunction, hypothyroidism, high cholesterol, ulcerative colitis, lower birth weight and size, obesity, decreased immune response to vaccines, reduced hormone levels, and delayed puberty.<sup>83</sup> EPA established a lifetime health advisory of 70 ppt for the combined concentrations of PFOA and PFOS in drinking water.<sup>84</sup>

Since then, in June 2018, the Agency for Toxic Substances and Disease Registry released an updated Draft Toxicological Profile for PFOA, PFOS, and other PFAS—suggesting that many of the chemicals are much more harmful than previously thought. For instance, the minimum risk levels, or the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health, was determined to be only 11 ppt for PFOA, and 7 ppt for PFOS.<sup>85</sup> Epidemiological studies show that many of these same health outcomes result from exposure to other PFAS.<sup>86</sup> Given these harms, states like Michigan, New York, New Hampshire, New Jersey, and Vermont have acknowledged the dangers of these compounds and have either proposed or finalized drinking water standards for various PFAS at 20 ppt and lower.<sup>87</sup>

Communities downstream of Chemours’ facility are still receiving drinking water with PFAS concentrations much higher than these health-based values. As recently as October 2019, total PFAS concentrations at the Cape Fear Public Utility Authority’s raw and finished water reached nearly 400 ppt.<sup>88</sup> Sampling results in December 2019 were still around 100 ppt.<sup>89</sup>

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<sup>83</sup> Arlene Blum et al., *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)*, 123 ENVTL. HEALTH PERSPECTIVES 5, A 107 (2015); U.S. EPA, *Fact Sheet: PFOA & PFOS Drinking Water Health Advisories*, 2.

<sup>84</sup> EPA, *Fact Sheet: PFOA & PFOS Drinking Water Health Advisories* at 2.

<sup>85</sup> Cape Fear Public Utility Authority (CFPUA), *CFPUA Statement on Recently Released DHHS Report* (June 21, 2018); see also ATSDR, *Toxicological Profile for Perfluoroalkyls, Draft for Public Comment* (June 2018) (“Draft 2018 Toxicological Profile for Perfluoroalkyls”).

<sup>86</sup> Draft 2018 Toxicological Profile for Perfluoroalkyls at 5-6, 25-26.

<sup>87</sup> Press Release, Mich. Dep’t of Env’t, Great Lakes, and Energy, *Michigan moves forward on PFAS in drinking water rules* (June 27, 2019), available at [https://www.michigan.gov/egle/0,9429,7-135-3308\\_3323-500772--,00.html](https://www.michigan.gov/egle/0,9429,7-135-3308_3323-500772--,00.html) (last visited Feb. 24, 2020); *New York to set limits for industrial chemicals in water*, AP, July 8, 2019, available at <https://apnews.com/63bffd42efaf49d08d114ea4443491f0> (last visited Feb. 24, 2020); Annie Ropeik, *N.H. Approves Unprecedented Limits for PFAS Chemicals in Drinking Water*, NHPR, July 18, 2019, available at <https://apnews.com/63bffd42efaf49d08d114ea4443491f0> (last visited Feb. 24, 2020); Press Release, Vt. Agency of Nat. Res., *Agency Of Natural Resources Initiates Rulemaking Process To Adopt Maximum Contaminant Level For PFAS Compounds*, available at <https://anr.vermont.gov/content/agency-natural-resources-initiates-rulemaking-process-adopt-maximum-contaminant-level-pfas> (last visited Feb. 24, 2020); James M. O’Neill, *NJ proposes strict new drinking water standards for cancer-linked chemicals*, NORTH JERSEY RECORD, Apr. 1, 2019, available at <https://www.northjersey.com/story/news/environment/2019/04/01/nj-sets-stringent-drinking-water-standard-cancer-linked-chemicals-pfoa-pfos-pfas/3334281002/> (last visited Feb. 24, 2020); Interstate Tech. Regulatory Council, *PFAS Fact Sheets, Section 4 Tables* (Aug. 2019).

<sup>88</sup> Cape Fear Public Utility Authority, *Emerging Contaminants*, available at <https://www.cfpua.org/761/Emerging-Compounds> (last visited Feb. 24, 2020).

<sup>89</sup> *Id.*

If Chemours does not clean up its groundwater and prevent it from continuously leaking into rivers and streams, these communities will continue to suffer.

***Chemours' pollution also threatens the environment.*** PFAS have been shown to cause damaging effects in fish,<sup>90</sup> amphibians,<sup>91</sup> mollusks,<sup>92</sup> and other aquatic invertebrates<sup>93</sup>—resulting in developmental and reproductive impacts, behavioral changes, adverse effects to livers, disruption to endocrine systems, and weakened immune systems.<sup>94</sup> Moreover, PFAS are extremely resistant to breaking down in the environment, can travel long distances, and bioaccumulate in organisms.<sup>95</sup>

***Technology is available to remove PFAS pollution.*** Future threats and harms caused by Chemours pollution can be eliminated because, as the company stated in its Corrective Action Plan, the technology exists to prevent the company's pollution from entering surface waters and harming downstream communities and aquatic ecosystems.<sup>96</sup> And the technology might even exist to control off-site groundwater.<sup>97</sup>

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<sup>90</sup> Huang, et al., *Toxicity, uptake kinetics and behavior assessment in zebrafish embryos following exposure to perfluorooctanesulphonic acid (PFOS)*, 98 AQUATIC TOXICOLOGY 139–147 (2010); Jantzen, et al., *PFOS, PFNA, and PFOA sub-lethal exposure to embryonic zebrafish have different toxicity profiles in terms of morphometrics, behavior and gene expression*, 175 AQUATIC TOXICOLOGY 160–170 (2016); Hagenaars, et al., *Structure–activity relationship assessment of four perfluorinated chemicals using a prolonged zebrafish early life stage test*, 82 CHEMOSPHERE 764–772 (2011); Du, et al., *Chronic effects of water-borne PFOS exposure on growth, survival and hepatotoxicity in zebrafish: A partial life-cycle test*, 74 CHEMOSPHERE 723–729 (2009); Rotondo, et al., *Environmental doses of perfluorooctanoic acid change the expression of genes in target tissues of common carp*, 37 ENVIRON. TOXICOLOGY & CHEM. 942–948 (2018); Liu, et al., *The thyroid-disrupting effects of long-term perfluorononanoate exposure on zebrafish (Danio rerio)*, 20 ECOTOXICOLOGY 47–55 (2011); Chen, et al., *Multigenerational Disruption of the Thyroid Endocrine System in Marine Medaka after a Life-Cycle Exposure to Perfluorobutanesulfonate*, 52 ENVIRON. SCI. & TECH. 4432–4439 (2018); Chen, et al., *Perfluorobutanesulfonate Exposure Causes Durable and Transgenerational Dysbiosis of Gut Microbiota in Marine Medaka*, 5 ENVIRON. SCI. & TECH. LETTERS 731–738 (2018); Chen, et al., *Accumulation of perfluorobutane sulfonate (PFBS) and impairment of visual function in the eyes of marine medaka after a life-cycle exposure*, 201 AQUATIC TOXICOLOGY 1–10 (2018).

<sup>91</sup> Ankley, et al., *Partial Life-Cycle Toxicity And Bioconcentration Modeling of Perfluorooctanesulfonate in the Northern Leopard Frog (Rana pipiens)*, 23 ENVIRON. TOXICOLOGY & CHEM. 2745 (2004); Cheng, et al., *Thyroid disruption effects of environmental level perfluorooctane sulfonates (PFOS) in Xenopus laevis*, 20 ECOTOXICOLOGY 2069–2078 (2011); Lou, et al., *Effects of perfluorooctanesulfonate and perfluorobutanesulfonate on the growth and sexual development of Xenopus laevis*, 22 ECOTOXICOLOGY 1133–1144 (2013).

<sup>92</sup> Liu, et al., *Oxidative toxicity of perfluorinated chemicals in green mussel and bioaccumulation factor dependent quantitative structure-activity relationship*, 33 ENVIRON. TOXICOLOGY & CHEM. 2323–2332 (2014); Liu, et al., *Immunotoxicity in green mussels under perfluoroalkyl substance (PFAS) exposure: Reversible response and response model development*, 37 ENVIRON. TOXICOLOGY & CHEM. 1138–1145 (2018).

<sup>93</sup> Ji, et al., *Oxicity of Perfluorooctane Sulfonic Acid and Perfluorooctanoic Acid on Freshwater Macroinvertebrates (Daphnia magna and Moina macrocopa) and Fish (Oryzias latipes)*, 27 ENVIRON. TOXICOLOGY & CHEM. 2159 (2008); Houde, et al., *Endocrine-disruption potential of perfluoroethylcyclohexane sulfonate (PFECES) in chronically exposed Daphnia magna*, 218 ENVIRON. POLLUTION 950–956 (2016); Liang, et al., *Effects of Perfluorooctane sulfonate on immobilization, heartbeat, reproductive and biochemical performance of Daphnia magna*, 168 Chemosphere 1613–1618 (2017); MacDonald, et al., *Toxicity Of Perfluorooctane Sulfonic Acid and Perfluorooctanoic Acid to Chironomus tentans*, 23 ENVIRON. TOXICOLOGY & CHEM. 2116 (2004).

<sup>94</sup> See supra notes 92–95.

<sup>95</sup> Draft 2018 Toxicological Profile for Perfluoroalkyls at 2, 534; see also EPA, *Technical Fact Sheet - Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA)*, 1, 3 (Nov. 2017).

<sup>96</sup> CAP at xvii.

<sup>97</sup> The Chemours Company FC, LLC, Cape Fear River PFAS Loading Reduction Plan – Supplemental Information Report, 53–55 (Nov. 2019).

***PFAS do not degrade.*** Chemours' failure to apply available technology in its plan is critical because, as the company admits, PFAS do not degrade.<sup>98</sup>

***Chemours' complaints about cost pale in comparison to the harm caused by the company's pollution.*** Chemours' intentional dumping of toxic PFAS into the air, water, and soil has devastated southeastern North Carolina. Municipalities are spending hundreds of millions of dollars on clean drinking water.<sup>99</sup> Multiple generations of families have gotten sick.<sup>100</sup> People who have been unknowingly drinking tainted water for decades are terrified and enraged every day. Residents who have newly moved into the area are shattered when they discover the contaminated water beneath their homes.<sup>101</sup> It is crucial that Chemours be held responsible for the harm that it has caused to these people and to the environment, and that DEQ requires Chemours to eliminate the harms it has caused.

Even if the cleanup costs billions of dollars—as Chemours claims without support—Chemours has, for decades, profited from its PFAS chemicals and from its unchecked pollution. Chemours is a multi-billion-dollar company. Just last year, the company had \$5.5 billion in net sale.<sup>102</sup> The local communities and municipalities that are already suffering from the company's intentional contamination should not be the ones left to shoulder the burden. DEQ must now require the company to incur the costs to clean up that pollution.

***The public, local communities, and municipalities will benefit tremendously from an effective cleanup.*** If DEQ holds Chemours to its commitments under the Consent Order and state law, there will be tremendous public and economic benefits from the resulting groundwater cleanup—both tangible and intangible. For instance, families may be able to rest knowing that the water they drink, and the rivers they swim and fish in, are no longer laced with Chemours' toxic chemicals. Homeowners might be able to sell their homes for a reasonable price. Drinking water utilities may not have to incur the heavy cost of upgrades. The local economy may benefit without the stigma of Chemours' PFAS pollution. By holding Chemours accountable, DEQ will make it less likely that other corporations will be so reckless with their industrial pollution.

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<sup>98</sup> CAP at 58.

<sup>99</sup> Makenzie Holland, *Cleaner water could cost Brunswick, CFPWA water customers*, STARNEWS ONLINE, Apr. 11, 2019, available at <https://www.starnewsonline.com/news/20180411/cleaner-water-could-cost-brunswick-cfpua-water-customers> (last visited Feb. 24, 2020); Paul Woolverton, *Cumberland County to spend \$10.5M to send water to GenX contaminated Gray's Creek*, THE FAYETTEVILLE OBSERVER, Jan. 6, 2020, available at <https://www.fayobserver.com/news/20200106/cumberland-county-to-spend-105m-to-send-water-to-genx-contaminated-grays-creek> (last visited Feb. 24, 2020); Greg Barnes, *Local governments, residents having to foot bill for industrial contamination*, NORTH CAROLINA HEALTH NEWS, Jan. 7, 2020, available at <https://www.northcarolinahealthnews.org/2020/01/07/local-governments-residents-having-to-foot-bill-for-industrial-contamination/> (last visited Feb. 24, 2020).

<sup>100</sup> Sharon Lerner, *New Teflon Toxin Found in North Carolina Drinking Water*, THE INTERCEPT, June 17, 2017, available at <https://theintercept.com/2017/06/17/new-teflon-toxin-found-in-north-carolina-drinking-water/> (last visited Feb. 24, 2020).

<sup>101</sup> Greg Barnes, *People are buying houses unaware of 'forever chemicals' in their well water*, NORTH CAROLINA HEALTH NEWS, Jan. 6, 2020, available at <https://www.northcarolinahealthnews.org/2020/01/06/people-are-buying-houses-unaware-of-forever-chemicals-in-their-well-water/> (last visited Feb. 24, 2020).

<sup>102</sup> Press Release, The Chemours Company Reports Fourth Quarter and Full Year 2019 Results, Feb. 13, 2020, available at <https://investors.chemours.com/news-releases/news-releases-details/2020/The-Chemours-Company-Reports-Fourth-Quarter-and-Full-Year-2019-Results/> (last visited Mar. 11, 2020).



Based on a thorough analysis of all relevant factors under 15A N.C. Admin. Code 2L .0106(k), therefore, state law mandates that DEQ require maximum cleanup and control of the company's groundwater pollution.

**V. Conclusion**

With this proposed Corrective Action Plan, Chemours continues to put the cost of its contamination on everyone else: on families downstream, on well owners, on utilities trying to provide clean drinking water, on DuPont. DEQ must not allow it.

DEQ cannot allow Chemours' blatant disregard for the law and for the well-being of those living in southeastern North Carolina to continue. DEQ must exercise its full authority under the Consent Order to seek penalties for Chemours' violations of paragraphs 12 and 16, reject Chemours' proposed plan, and require that the company clean up its PFAS pollution.

Thank you for considering these comments. Please contact me at ggisler@selcnc.org or 919-967-1450 if you have any questions regarding this letter.

Sincerely,



Geoffrey R. Gisler  
Senior Attorney



Jean Zhuang  
Staff Attorney



Kelly Moser  
Senior Attorney

Cc (via email):  
Dana Sargent, CFRW  
Kemp Burdette, CFRW  
Bill Lane, DEQ  
Francisco Benzoni, NCDOJ

Michael Abraczinskas, DAQ  
Michael Scott, DWM  
Linda Culpepper, DWR  
David Shelton, Chemours  
Brian Long, Chemours  
John Savarese, Wachtell, Lipton  
Joel Gross, Arnold & Porter

## ATTACHMENT 1

October 7, 2019

**VIA E-MAIL**

Francisco Benzoni  
Special Deputy Attorney General  
Environment Division  
114 Edison Street  
Raleigh, NC 27603

Geoff Gisler  
Senior Attorney  
Southern Environmental Law Center  
601 W. Rosemary Street  
Chapel Hill, NC 27516

Re: Chemours' PFAS Loading Reduction Plan

Dear Francisco and Geoff:

This is in response to your September 26, 2019 letter concerning the PFAS Loading Reduction Plan (the "Reduction Plan"), which Chemours submitted on August 26, 2019, as required under paragraph 12 of the Consent Order.

Chemours agrees that the Paragraph 12 requirements "represent central components of the Consent Order," and Chemours has approached those requirements consistent with that understanding. To that end:

- We suggested meetings, which took place with DEQ on May 22 and with CFRW on June 6, to preview for you how Chemours was approaching this project and related ones, and to get your early input.
- Prior even to the submission of the Reduction Plan, we requested and scheduled the joint meeting with DEQ and CFRW that took place on September 13, 2019 in Raleigh, to have Chemours' consultants review the key components of the Reduction Plan, and get your early input on them.
- In response to the input we received at the September 13 meeting, I contacted you both on September 20 to suggest a path forward that addressed the questions and concerns you raised at the meeting.

# Arnold & Porter

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Simply put, we know that paragraph 12 is important to you, and Chemours is committed to working with both DEQ and CFRW to finalize a plan that we will all agree meets the requirements of the Consent Order and expeditiously achieves maximum reductions in PFAS loadings from the Fayetteville Works facility to surface waters.

That said, we do not agree with a number of the assertions in your September 26 letter or with the letter's suggestion that the Reduction Plan does not satisfy the requirements of Paragraph 12. The Reduction Plan is a robust work product based on voluminous data collection. It outlines a series of seven significant steps that Chemours is prepared to take and that is expected to reduce PFAS loadings by more than half in the two-to-five-year time frame. However, rather than debate the sufficiency of the Reduction Plan as submitted, we are prepared to take the following additional steps to address your questions and concerns as stated in the meeting and in your letter:

Submission of Supplemental Plan: Chemours will submit a Supplemental Plan by November 1, 2019. The Supplemental Plan will build on the information provided to you at the September 13 meeting and will contain planning level cost estimates for the remedial measures in the Reduction Plan, and further information on the economic and technological feasibility of the remedial measure options that are not being proposed. The Supplemental Plan will also provide further information on the timetables for the actions proposed in the Reduction Plan. In that regard, we understand your timing concern to be substantially related to the period necessary to address the seeps. The Supplemental Plan will address why the five-year period identified in the Reduction Plan was selected and what Chemours is prepared to do to expedite the process to the extent feasible. Similar analyses will be provided for the timetables for other proposed actions.

Technical Meeting Concerning Seeps: In regard to the seeps, and the challenges they present, we look forward to our technical meeting on October 16 at which our engineers can discuss with yours how the project is being envisioned, and the specific remedial options under consideration. We think that will be an important foundation for drafting language for the Consent Order that will incorporate the seep remediation project in a manner that provides DEQ and CFRW with assurances that the project will be comprehensive and expeditious, and also provides Chemours the flexibility to design and engineer the project effectively and efficiently.

On-Site Groundwater: Your letter raises a concern about the fact that the Reduction Plan does not include action to address on-site groundwater. It states that "The company has found that onsite groundwater contributes up to 22 percent of the PFAS loading into the Cape Fear River ... Yet the submission does not evaluate any remedial options for onsite groundwater." As you know, addressing on-site groundwater will be a major focus of the Corrective Action Plan due in December, and Chemours and its consultants are

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intensively engaged in evaluating the data in the Site Assessment submitted on September 30, and finalizing the site model that will allow for precise evaluation of the benefits that could be realized from different potential options to address on-site groundwater.

For that reason, the Reduction Plan had proposed to address on-site groundwater issues as part of the Corrective Action Plan. *See, e.g.*, Reduction Plan at v, 1, 19, 20, 32. You have expressed concern that those issues should also be a part of the Paragraph 12 process and its requirements for maximum feasible reductions in the two or five year period. To address that concern while allowing Chemours the necessary time to consider on-site groundwater remedial options in an orderly and efficient manner, we propose, as I have previously communicated to you, that we agree to merge the Paragraph 12 and 16 requirements with respect to on-site groundwater. This would be consistent with the provision of paragraph 12.g of the Consent Order stating that “Chemours may propose such a Corrective Action Plan that integrates the requirements of this paragraph.”

Under this approach, Chemours would be obligated to propose in the Corrective Action Plan those feasible measures that would achieve maximum reductions in loadings to surface waters from on-site groundwater in two and five year periods. This would include consideration of measures that could impact not just loadings from on-site groundwater to the Cape Fear River, but to other surface waters as well. This integrated approach would also ensure that the shorter term and longer term actions being proposed are consistent.

Interim Actions: At the September 13 meeting and in your letter, you raised the issue of potential interim actions if, for example, the seep remediation project took as long as five years. Chemours agrees that such interim actions should be considered, and proposes that it identify those actions in the integrated Corrective Action Plan to be submitted in December.

Time to Amend the Consent Order: Chemours is prepared to stipulate, as you have proposed, to an extension to December 9, 2019 for submission of a motion to amend the Consent Order to incorporate Paragraph 12 commitments. However, we ask you to consider stipulating to a longer extension, until February 2020, for this submission. That would allow DEQ and CFRW sufficient time to review the Supplemental Plan and determine whether they agree with Chemours’ feasibility assessment, and would allow the parties to present a comprehensive set of modifications to the Court by the first anniversary of the Consent Order. Moreover, allowing additional time to work through these issues will not delay the actual reductions of PFAS loadings, as Chemours will move forward with all proposed actions even prior to the Consent Order amendments.

# Arnold & Porter

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We hope you will agree that the path forward articulated above is responsive to your concerns. I suggest that we arrange a time in the next few days to discuss this, and I will contact each of you to schedule that.

Sincerely,

A handwritten signature in black ink, appearing to read "Joel M. Gross". The signature is fluid and cursive, with the first name "Joel" being more prominent than the last name "Gross".

Joel M. Gross

## ATTACHMENT 2



September 26, 2019

*Via Email*

Joel Gross  
Arnold & Porter Kaye Scholer LLP  
Counsel for The Chemours Company, LLC  
601 Massachusetts Ave, NW  
Washington, DC 20001-3743  
Joel.Gross@arnoldporter.com

**Re: Chemours' PFAS Loading Reduction Plan**

The North Carolina Department of Environmental Quality ("DEQ") and Cape Fear River Watch have reviewed Chemours' PFAS Loading Reduction Plan, submitted on August 26, 2019. As we made clear during our meeting on September 13, 2019, we believe that the plan must be supplemented and revised in order to satisfy the requirements of Paragraph 12.

Under Paragraph 12 of the Consent Order, Chemours is required to:

submit to DEQ and Cape Fear River Watch a plan demonstrating the *maximum reductions in PFAS loading from the Facility* (including loading from contaminated stormwater, non-process wastewater, and groundwater) to surface waters, including Old Outfall 002, that are economically and technologically feasible, and *can be achieved within a two-year period* ("PFAS reduction targets"). The plan shall be supported by interim benchmarks to ensure continuous progress in reduction of PFAS loading. *If significantly greater reductions can be achieved* in a longer implementation period, Chemours may propose, in addition, an implementation period of up to five years supported by interim benchmarks to ensure continuous progress in reduction of PFAS loading.

Chemours' August 26, 2019 submission lacks required information and analysis.

First, the submission does not evaluate remedial options for some of the largest pathways of pollution identified by company. The company has found that onsite groundwater contributes up to 22 percent of the PFAS loading into the Cape Fear River. Reduction Plan at 13. Yet the submission does not evaluate any remedial options for onsite groundwater. Remedial options for onsite groundwater that Chemours has previously identified, but has not evaluated in this submission, include:

- Installation of a recovery trench(es), and pumping and treating contaminated groundwater from the Perched Zone;

- Construction of a horizontal recovery well, and pumping and treating contaminated groundwater from the Perched Zone;
- Installation of temporary vertical well points and headers to dewater the Perched Zone and treat contaminated groundwater;
- Pumping and treating contaminated groundwater from Surficial and Black Creek Aquifers using existing long-term wells;
- Pumping and treating contaminated groundwater from Surficial and Black Creek Aquifers using vertical recovery wells;
- Pumping and treating contaminated groundwater from Surficial and Black Creek Aquifers using horizontal recovery wells;
- Installation of sheet pile wall parallel to surface waters and treating contaminated groundwater from the Surficial and Black Creek Aquifers; and
- Installation of a permeable reactive barrier wall parallel to surface waters.

Chemours Focused Feasibility Study Report – PFAS Remediation (Feb. 2018) at 15-19. It is unclear why Chemours chose not to analyze these methods in its submission. Chemours' proposal to defer all consideration of groundwater remediation to the corrective action plan due at the end of this year suggests that Chemours may view such remediation as outside the scope of paragraph 12. However, paragraph 12 requires maximum feasible reductions in PFAS loading to surface waters that can be achieved in a two-year period, *regardless of source*.

The submission similarly does not evaluate remedial options for Willis Creek and Georgia Branch Creek, two tributaries of the Cape Fear River that have long received, and continue to receive, PFAS contamination from the facility. The submission estimates that Willis Creek and Georgia Branch together contribute up to 14% of PFAS loading to the Cape Fear River. Reduction Plan at 13. Groundwater seeps to Willis Creek have had combined PFAS concentrations measured as high as 22,000 ppt, and seeps to Georgia Branch Creek have had combined concentrations measured at 3,500 ppt. Seeps and Creeks Investigation Report at 19. Whereas Chemours proposes to capture and treat groundwater seeps into the Cape Fear River, the company proposes nothing for the seeps into Willis Creek and Georgia Branch Creek. Under paragraph 12, the company must evaluate a range of remedial options for each pathway of pollution. This evaluation is necessary to ensure that DEQ and Cape Fear River Watch can consider Chemours selection of remedial measures that will achieve *maximum* feasible reductions in PFAS loading, as stated in the Consent Order.

Second, the submission lacks any analysis of economic and technological feasibility. For instance, the submission states that feasible actions “were not identified for the Willis Creek, Georgia Branch Creek and offsite groundwater pathways. Any potential actions for these pathways would be extensively disruptive to local wildlife habitats and costs would be disproportionately high compared to relative benefits.” Reduction Plan at 19. However, the company has provided no analysis to support that claim. Similarly, when dismissing remedial options for Outfall 002, the submission simply includes a table that has checkmarks for whether or not an option is

technologically and economically feasible. Reduction Plan at 29. Without detailed information on the feasibility of the options identified, DEQ and Cape Fear River Watch cannot meaningfully assess the submission.

Third, the submission does not satisfy Chemours' burden of demonstrating that GenX and PFMOAA concentrations in Outfall 002 cannot be reduced by at least 80%. While the submission identifies some options that could be implemented to achieve a greater than 80% reduction, the submission rules out the two most impactful options on the grounds that costs would be "extremely high" and "disproportionately large compared to estimated benefits to Cape Fear River loading reductions." The submission does not include any information to support the assertion that the costs of these measures are "extremely high" let alone disproportionately so, particularly in light of the downstream utilities' plans to invest over \$150 million to treat river water contaminated by PFAS. In order to satisfy Chemours' burden of demonstrating that PFAS concentrations cannot be reduced by at least 80%, Chemours must provide detailed information to support its conclusion that these measures are infeasible.

Fourth, the submission does not justify the time frames for the remedial actions that are proposed. The Consent Order requires Chemours to present the parties with maximum reductions that "can be achieved within a two-year period." Only "[i]f significantly greater reductions can be achieved in a longer implementation period" can Chemours propose remediation options that take "up to five years." In its submission, Chemours proposes to address four groundwater seeps into the Cape Fear River, and asserts that a five-year timeline is needed to carry out its proposal without any analysis and without any discussion of whether there are interim actions that can be taken within two years that will significantly reduce PFAS loading to the Cape Fear River. Reduction Plan at 21. In its revised submission, the company must discuss what options can be achieved within two years for each pathway of pollution. If Chemours proposes a longer time frame for any remedial options, it must show that "significantly greater reductions can be achieved."

In summary, in order for DEQ and Cape Fear River Watch to be able to assess the adequacy of Chemours' PFAS Loading Reduction Plan, Chemours must revise the plan to include the following information, as required by Paragraph 12(a) of the Consent Order:

- Chemours must identify a range of options available to reduce PFAS loading from the facility to the Cape Fear River, Willis Creek, Georgia Branch Creek, and Old Outfall 002 from contaminated groundwater (including groundwater-fed seeps), stormwater, and non-process wastewater that can be achieved within a two-year period. *For each option identified, Chemours must provide an analysis of the economic and technological feasibility of the option, along with an estimate of anticipated reductions. If Chemours proposes not to implement a measure that has been identified, Chemours must demonstrate that the measure is technologically or economically infeasible or that less expensive measures can be implemented to achieve the same or a better result.*

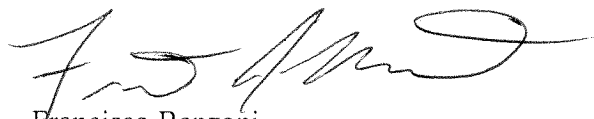
- For any of the pathways of contamination to the Cape Fear River, Willis Creek, Georgia Branch Creek, and Old Outfall 002, Chemours must evaluate whether significantly greater reductions can be achieved in more than two years, but less than five years. *This analysis must include an economic and technological feasibility analysis for each remedial option identified along with an estimate of the additional reductions that can be achieved by extending the time period for implementation to more than two years but less than five years. For any options that extend beyond two years, interim measures and benchmarks should also be identified.*

In the interest of working together to reach agreement upon measures that can be incorporated into the Consent Order, we propose that the Parties stipulate to an extension of time for submission of a motion to amend the Consent Order to December 9, 2019. DEQ and Cape Fear River Watch request that Chemours submit a revised plan by November 1, 2019.

Chemours' obligations under Paragraph 12 represent central components of the Consent Order designed to ensure maximum feasible reductions in PFAS loading to the Cape Fear River and downstream public water intakes. DEQ and Cape Fear River Watch intend to fully enforce the requirements set forth in the Consent Order to ensure that these goals are met.

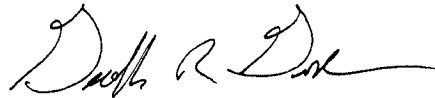
Please contact the undersigned if you have any questions regarding this letter.

Sincerely,



Francisco Benzoni

*Counsel for the North Carolina Department of  
Environmental Quality*



Geoff Gisler

*Counsel for Cape Fear River Watch*

Cc (via email):  
Sheila Holman, DEQ  
Bill Lane, DEQ  
Michael Abraczinskas, DAQ  
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Kelly Moser, SELC  
Jean Zhuang, SELC  
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Brian Long, Chemours  
John Savarese, Wachtell, Lipton, Rosen & Katz

## ATTACHMENT 3

October 23, 2019

*Via Email*

Joel Gross  
Arnold & Porter Kaye Scholer LLP  
Counsel for The Chemours Company, LLC  
601 Massachusetts Ave, NW  
Washington, DC 20001-3743  
Joel.Gross@arnoldporter.com

**Re: PFAS Loading Reduction Plan**

Dear Joel:

The North Carolina Department of Environmental Quality (“DEQ”) and Cape Fear River Watch have reviewed your October 7, 2019 response to the letter we sent on September 26, 2019, attached here for convenience. As we stated, Chemours’ PFAS Loading Reduction Plan, submitted in August 2019, did not meet the requirements of Paragraph 12 of the consent order. We intend to enforce the requirements of Paragraph 12 as originally contemplated and agreed to by Chemours.

We do not agree with your proposal to “merge the Paragraph 12 and 16 requirements with respect to on-site groundwater.” Paragraph 12’s requirement that Chemours provide a plan to demonstrate “maximum reductions in PFAS loading from the Facility (including loading from contaminated . . . groundwater)” was included in the original consent order filed November 21, 2018. Chemours has, therefore, been on notice for nearly eleven months that such an analysis was required, yet did not include the required analysis in its August 26th submittal. This submittal did not comply with the requirements of the consent order.

In our September 26 letter, Cape Fear River Watch and DEQ gave Chemours the opportunity to submit a revised plan—complete with the elements described in our September 26 letter—by November 1, 2019. In your October 7, 2019 response, you indicated Chemours would provide some additional information and analysis in a November 1, 2019 submittal, but you also made clear that Chemours does not intend to address groundwater measures in its November 1 submission. During a telephone call on October 18, 2019, you stated once again that Chemours will not address groundwater measures its November 1, 2019 submittal. As we indicated in our October 18, 2019 telephone call, Chemours’ failure to address groundwater measures in its Paragraph 12 submittal is unacceptable to us, and we will not agree to an unjustified four-month delay from the consent order’s deadline.

It remains our position that Chemours’ November 1, 2019 should include (and that its August 2019 submittal should have included) the following information:

- Chemours must identify a range of options available to reduce PFAS loading from the facility to the Cape Fear River, Willis Creek, Georgia Branch Creek, and Old Outfall 002 from contaminated groundwater (including groundwater-fed seeps), stormwater, and non-process wastewater that can be achieved within a two-year period. For each option identified, Chemours must provide an analysis of the economic and technological feasibility of the option, along with an estimate of anticipated reductions. If Chemours proposes not to implement a measure that has been identified, Chemours must demonstrate that the measure is technologically or economically infeasible or that less expensive measures can be implemented to achieve the same or a better result.
- For any of the pathways of contamination to the Cape Fear River, Willis Creek, Georgia Branch Creek, and Old Outfall 002, Chemours must evaluate whether significantly greater reductions can be achieved in more than two years, but in less than five years. This analysis must include an economic and technological feasibility analysis for each remedial option identified along with an estimate of the additional reductions that can be achieved by extending the time period for implementation to more than two years but less than five years. For any options that extend beyond two years, interim measures and benchmarks should also be identified.

We further specifically request that Chemours' November 1, 2019 submission include a discussion of interim measures identified by the company to address PFAS loading from seeps into the Cape Fear River, including but not limited to those discussed at the on-site meeting on October 16.

DEQ and Cape Fear River Watch continue to evaluate appropriate next steps in response to Chemours' failure to provide an adequate submittal under Paragraph 12. We remain committed to ensuring that Chemours achieve maximum feasible reductions of PFAS loading from the facility to the Cape Fear River and downstream drinking water intakes on an expedited basis. We will not hesitate to exercise our rights under the consent order to the fullest extent possible to achieve this goal.

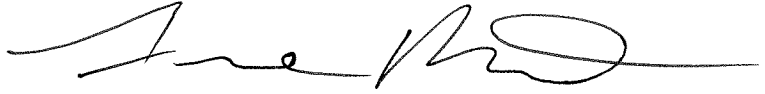
Although Chemours must move forward with its November 1 submittal as described above, we propose that counsel meet and confer by no later than November 8, 2019 to discuss a path forward that will resolve the issues outlined in this letter and ensure swift and significant reductions in PFAS loading to the Cape Fear River.

This letter serves as notice pursuant to paragraph 38 of the consent order that Cape Fear River Watch considers this issue a "compliance concern that could result in an enforcement action."

Please contact the undersigned if you have any questions regarding this letter.



Sincerely,

A handwritten signature in black ink, appearing to read 'Francisco Benzoni', with a long horizontal line extending to the right.

Francisco Benzoni  
*Counsel for the North Carolina Department of  
Environmental Quality*

A handwritten signature in black ink, appearing to read 'Geoff Gisler', with a long horizontal line extending to the right.

Geoff Gisler  
*Counsel for Cape Fear River Watch*

Cc (via email):  
Sheila Holman, DEQ  
Bill Lane, DEQ  
Michael Abraczinskas, DAQ  
Michael Scott, DWM  
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