



August 20, 2025

Mr. Richard Rogers  
Director, Division of Water Resources

Mr. Derek Denard  
Environmental Program Consultant, Division of Water Resources

North Carolina Department of Environmental Quality  
1646 Mail Service Center  
Raleigh, NC 27699

Via email to [publiccomments@deq.nc.gov](mailto:publiccomments@deq.nc.gov)

**RE: Recommendations for Alcoa's Badin Business Park Renewed NPDES Permit (NC0004308)**

Dear Mr. Rogers and Mr. Denard,

The Duke Environmental Law and Policy Clinic ("ELPC"), the Southern Environmental Law Center ("SELC"), and the Southern Coalition for Social Justice ("SCSJ") respectfully submit these comments on behalf of the Yadkin Riverkeeper ("YRK"), the Concerned Citizens of West Badin ("CCWB"), the North Carolina Environmental Justice Network ("NC EJN"), CleanAIRE NC, North Carolina Black Alliance, Toxic Free NC, North Carolina Conservation Network, North Carolina Sierra Club, Concerned Citizens of Northampton County, and the University of North Carolina Environmental Justice Action Research Clinic, to inform Alcoa's Badin Business Park ("BBP") National Pollutant Discharge Elimination System ("NPDES") permit renewal for the former Alcoa Badin Works facility.

We appreciate the North Carolina Department of Environmental Quality's ("NC DEQ") efforts this year to engage the community and increase transparency in this process. We would like to thank the Division of Water Resources ("DWR") for listening to our previous comments<sup>1</sup> and making the following improvements to the permit:

1. Requiring an Effluent Pollutant Scan at Outfalls 005, 012, and 013;
2. Requiring signage identifying Outfalls 011 and 012;

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<sup>1</sup> Duke Environmental Law and Policy Clinic, *Request for Public Hearing and Substantive Recommendations for Alcoa's BBP Renewed NPDES Permit*, sent to DWM and DWR on August 6, 2022 via emails to Richard Rogers, Michael Scott, Elizabeth Biser, Sushma Masemore, and Joy Hicks among others.

3. Increasing stormwater sampling frequency for Total Suspended Solids (“TSS”), Chemical Oxygen Demand (“DOC”), aluminum, cyanide, and fluoride from twice per year to quarterly;
4. Increasing sampling frequency for fluoride and cyanide at Outfall 005 from monthly to twice per month; and
5. Monitoring for pH, DOC, and Total Hardness to determine if effluent limits are needed for aluminum.

In our review of the draft permit, we have identified additional ways in which it could be even more protective of water quality and public health. Badin Lake and Little Mountain Creek are especially important for drinking water, wildlife habitat, recreation, and the aesthetic value of the area. The North Carolina Constitution and its General Statutes protect these natural resources as part of the public trust.

Our recommendations for this NPDES permit renewal are as follows and will be explained in more detail throughout this letter:

1. The new permit should include the details of enforcement consequences if Alcoa’s BBP continues to use a laboratory without sufficient test sensitivity to report results for cyanide down to the permit limit of 5 micrograms/liter (“µg/L”).
2. The new permit should include a framework that allows for both increasing and decreasing the monitoring frequency at Outfall 005 based on sampling results—rather than just providing a pathway to reduced monitoring.
3. DWR should increase sampling frequency from twice per year to monthly for DOC, pH, and Total Hardness for Outfalls 005, 011, 012, 013, 019; stormwater Outfalls 002, 004, 017, 018, 020, 022, and 023; and instream monitoring at the mixing zone – to ensure sampling captures a wide range of seasonal and flow conditions.
4. DWR should require that Alcoa’s BBP add signage to Outfall 013, consistent with the other outfalls discharging to Badin Lake (011 and 012), and eliminate the mixing zone at Outfall 012. These should be interim measures until DWR is able to remove or divert the contaminated water from discharging to Badin Lake altogether.
5. The new permit should include monthly average sampling effluent limits for fluoride and cyanide at Outfall 011.
6. DWR should develop a plan with the Division of Waste Management (“DWM”) to ensure Alcoa's BBP removes the contaminated source material, instead of leaving the material on-site to continue to cause exceedances and high concentrations of pollutants in discharges.
7. NC DEQ and DWR should continue to enhance data transparency, accessibility, and community engagement.

## I. Factual Background

### a. The Founding and Segregation of West Badin

The town of Badin was founded by the French-owned Southern Aluminum Company in 1912 to house its future aluminum smelting operation.<sup>2</sup> The company selected the area, in part, because of the potential hydroelectric energy source provided by the narrows of the Yadkin River, which would be needed to meet the high energy demands of aluminum smelting.<sup>3</sup> In 1915, the Aluminum Company of America, later known as Alcoa, Inc., purchased the town of Badin, and the unfinished dam that would one day impound Badin Lake, from its founders.<sup>4</sup>

After acquiring this new home for Alcoa's expanding aluminum empire, the company went about recruiting workers, including African Americans, to move to Badin. Alcoa advertised its "Negro Village" in a newspaper publication, where it touted the benefits of company towns to African Americans.<sup>5</sup> Black workers flocked to the town, seeing it as an opportunity to escape the oppressive fields of share cropping and obtain, as the advertisements promised, good wages, healthcare, civic and social opportunities, homes for families, and lodging for single men.<sup>6</sup> As a company town, Alcoa, rather than a local government, provided all municipal public services including schools, police, roads, and sanitation. These services were provided to black workers and their families in West Badin, while Alcoa's white workers were housed and provided separate amenities in East Badin.<sup>7</sup> This direct, intentional spatial segregation by race laid the groundwork for long-term disparities in environmental and health outcomes.

In 1989, the North Carolina General Assembly converted Badin from a company town to an incorporated municipality.<sup>8</sup> In doing so, the town was divided into two electoral districts: West Badin and East Badin. West Badin was delineated to include all the area formerly advertised as "Negro Village" as well as two of Alcoa's largest unlined dumps.<sup>9</sup> Badin's town charter also expressly stripped the municipality's authority to regulate industrial uses and activities, a power typically provided to all municipalities under North Carolina law.<sup>10</sup>

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<sup>2</sup> See generally North Carolina Collections, *Badin, N.C.* 33, DigitalNC at 1 (1920), <https://lib.digitalnc.org/record/105294?v=uv#?c=&m=&s=0&cv=25&r=0&xywh=-444%2C0%2C7984%2C4631>.

<sup>3</sup> See *id.* at 21–26.

<sup>4</sup> N.C. Dep't of Nat. & Cultural Res., *L'Aluminium Francais (L-95)* (Jan. 16, 2024), <https://www.dncr.nc.gov/blog/2024/01/16/laluminium-francais-l-95> [<https://perma.cc/YZ6U-WZZ4>].

<sup>5</sup> See North Carolina Collections, *Badin* supra note 2, at 21.

<sup>6</sup> *Id.* at 21–25.

<sup>7</sup> See generally *id.*

<sup>8</sup> See 1989 N.C. Sess. Laws 894.

<sup>9</sup> See *id.*

<sup>10</sup> See *id.*, Section 6.1 ("In recognition of existing regulatory authority of other governmental entities and notwithstanding common law or any general law to the contrary now or hereinafter enacted, the Town shall not adopt any regulatory ordinance or resolution relating to or affecting industrial facilities and operations.").

In the 2000s, Alcoa began shifting its operations overseas, seeking lower energy and production costs. In 2007, Alcoa closed its Badin Works plant, leaving behind thousands of tons of hazardous waste buried in unlined sites around the community.

### **b. The Generation of Alcoa's Pollution**

The root of Alcoa's current pollution woes is the hazardous waste it generated for decades as a byproduct of the aluminum smelting process. Primary aluminum smelting produced and exposed workers to many harmful substances. The process involved mixing crushed bauxite with sodium hydroxide to extract aluminum oxide. Workers then placed the aluminum oxide into carbon-lined steel cells, known as "pots," which separated the aluminum through an electrochemical process. After, workers transferred the molten aluminum in a cryolite bath to remove impurities and then molded the aluminum into ingots.

The process of converting aluminum oxide into aluminum required periodic replacement of the carbon lining in each pot. The used pot lining, called "spent potliner," contains cyanide and fluoride compounds and is categorized as hazardous waste by the United States Environmental Protection Agency ("EPA"). Potliner also includes a layer of refractory brick which absorbs the impurities from the cryolite bath. Black workers at Alcoa manually removed and replaced spent potliner with little to no protective equipment.

For decades, Alcoa buried its spent potliner in unlined pits on its property and elsewhere in the West Badin community. Old pieces of brick have been found around Badin Lake. Alcoa also gave old bricks and blocks used in the smelting process to families in West Badin. To this day, one can see these colorful bricks in the foundation of homes, retaining walls, and car ports in West Badin.

### **c. Unequal Exposure to Alcoa's Pollution**

As demonstrated in the Badin Business Park Draft Community Profile,<sup>11</sup> the demographics and disparities of Badin today mirror that of decades ago. Today, approximately 36% of Badin's approximately 2,000 residents are African American, and roughly half are white.<sup>12</sup> As was the case when Alcoa recruited workers to Badin, most of the town's African American residents live in West Badin, while East Badin is largely home to white residents.<sup>13</sup>

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<sup>11</sup> See generally NC DEQ, *Badin Business Park – Draft Community Profile* (July 7, 2025), <https://edocs.deq.nc.gov/WaterResources/DocView.aspx?id=3911073&dbid=0&repo=WaterResources&cr=1> [https://perma.cc/6P6Y-GRAU].

<sup>12</sup> U.S. Census Bureau, *Race and Ethnicity* (2020), [https://data.census.gov/profile/Badin\\_town,\\_North\\_Carolina?g=160XX00US3702960#race-and-ethnicity](https://data.census.gov/profile/Badin_town,_North_Carolina?g=160XX00US3702960#race-and-ethnicity); see also U.S. Census Bureau, *P8 | Race* (2020), <https://data.census.gov/table/DECENNIALDHC2020.P8?g=160XX00US3702960> (2,024 total population of Badin, with 1,089 residents who are White alone and 722 who are Black or African American alone).

<sup>13</sup> U.S. Census Bureau, "Hispanic or Latino, and Not Hispanic or Latino by Race," Decennial Census, Dec Demographic And Housing Characteristics at Table P9, [https://data.census.gov/table/DECENNIALDHC2020.P9?t=Race+and+Ethnicity&g=1400000US37167930200\\$1000000](https://data.census.gov/table/DECENNIALDHC2020.P9?t=Race+and+Ethnicity&g=1400000US37167930200$1000000) (last accessed Aug. 11, 2025).

Infrastructural barriers partition West Badin residents from East Badin, where nearly all the town's amenities are located. Highway 740, railroad tracks, and the impassable remnants of Alcoa's pot houses separate the largely African American community from the town's public library, elementary school, post office, public parks, and convenience stores. These resources are only accessible by vehicle or by walking a steep, narrow road between Alcoa's shuttered plant and hazardous waste landfill. East Badin homes, on the other hand, are located around these public resources, making them far more accessible.

Community members in West Badin have experienced heightened exposures to Alcoa's pollution. Employment records and personal testimonies demonstrate that black employees at Alcoa often held the most dangerous jobs in the potrooms.<sup>14</sup> These positions brought black workers in closer and more frequent contact with the harmful substances produced in the smelting process.<sup>15</sup> Burns were also prevalent. These workers were given little to no protective equipment. Some have reported that while Alcoa higher-ups wore hazmat suits to visit the potrooms, the black former employees reported working long hours in no more than cotton shirts. Many workers wore these clothes, covered in harmful substances, back home where they greeted their families and did their laundry with the rest of the family's laundry, exposing children and spouses to Alcoa's pollution.

In addition to increased occupational exposures from their time working in the potrooms, West Badin residents are at a heightened risk of exposure to environmental exposures from the legacy waste and pollution. Most of Alcoa's remaining property and hazardous waste, including its largest unlined landfill, are in West Badin. Moreover, West Badin residents, many of whom are former Alcoa employees, have reported other unmarked locations around the West Badin community where Alcoa dumped its waste. Former employees recall disposing Alcoa's waste in wooded areas around West Badin and seeing oily substances discharged into grassy alleys between homes in West Badin.

The decades of disparate environmental and economic treatment have taken a toll on the community. Today, 39% of households in West Badin are considered "very low income" or "low income," compared to 16% of households in East Badin.<sup>16</sup> Former employees have noted the high rates of cancer and commonality of cancer and respiratory disease as the cause of death for former Alcoa workers,<sup>17</sup> and scientific research has confirmed that employees working in the potrooms suffer from high rates from bladder and respiratory cancers.<sup>18</sup>

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<sup>14</sup> See generally Elizabeth S. McClure et al., *Cancer and Non-Cancer Mortality Among Aluminum Smelting Workers in Badin, North Carolina*, 63 AM. J. IND. MED. 755 (July 10, 2020), <https://pmc.ncbi.nlm.nih.gov/articles/PMC7890681/pdf/nihms-1650570.pdf> [<https://perma.cc/4ESN-ZLXC>].

<sup>15</sup> *Id.* at 4.

<sup>16</sup> U.S. Census Bureau, "Hispanic or Latino, and Not Hispanic or Latino by Race," Decennial Census, Dec Demographic and Housing Characteristics at Table P9.

<sup>17</sup> Emily Cataneo, *The Long, Complicated Legacy of a North Carolina Company Town*, UNDARK (Dec. 15, 2021), <https://undark.org/2021/12/15/the-long-legacy-of-a-company-town/> [<https://perma.cc/U4KF-RCTW>].

<sup>18</sup> McClure *supra* note 14.

#### **d. Alcoa's Record of Non-Compliance**

According to documents available on Laserfische, since receiving its current permit in 2019, Alcoa has received over 40 Notices of Violation (“NOV”) and been assessed merely \$16,557.29 in civil penalties.<sup>19</sup> Since the expiration of its permit in September of 2022, Alcoa has received nearly a dozen NOV’s and been assessed just \$6,888.76 in civil penalties. These violations do not account for the effluent exceedances of recommended water quality criteria for other pollutants monitored under Alcoa’s permit. In 2021, for example, Alcoa reported aluminum discharges as high as 2,300 µg/L, which is more than triple the 750 µg/L benchmark value set in Alcoa’s 2019 permit and likely exceeds EPA’s recommended discharge limits for aluminum.<sup>20</sup>

The meager environmental protections provided in Alcoa’s water permits have all been won through hard-fought, community led initiatives. In 2017, the Southern Environmental Law Center, on behalf of Concerned Citizens of West Badin, filed a petition for a contested hearing in the Office of Administrative Hearings, challenging Alcoa’s 2017 NPDES permit.<sup>21</sup> Prior to this suit, Alcoa’s permit had even fewer effluent limits, fewer testing requirements, and deteriorating stormwater systems. As a result of this action, for the first time, Alcoa’s permit set effluent limitations for cyanide and fluoride, and Alcoa was required to update the stormwater system.<sup>22</sup>

Community concerns around Alcoa’s pollution reach beyond bounds of waterways. Most recently, despite ample opportunities to disclose its intentions during quarterly, invite-only community advisory board meetings, Alcoa began demolition of their shuttered pot houses with little notice to the public. Despite concerns raised by the community, the demolition has continued with few updates, notices, or public input. Alcoa has acknowledged that its demolition activity may have caused recent exceedances of fluoride effluent limitations at Outfall 005.<sup>23</sup>

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<sup>19</sup>See generally NC0004308,

<https://edocs.deq.nc.gov/WaterResources/Browse.aspx?id=534478&dbid=0&repo=WaterResources> (select folders “2019,” “2020,” “2021,” “2022,” “2023,” “2024,” and “2025” to view individual Notices of Violation).

<sup>20</sup> Badin Business Park LLC, Discharge Monitoring Report at 8 (Apr. 28, 2021),

<https://edocs.deq.nc.gov/WaterResources/DocView.aspx?id=1752584&dbid=0&repo=WaterResources>; see also N.C. Dept. of Env’t Quality, Permit to Discharge Wastewater and Stormwater Under the National Pollutant Discharge Elimination System at Badin Business Park 10 (Aug. 1, 2019); EPA, *Final Aquatic Life Ambient Water Quality Criteria for Aluminum 2018* (2018), <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100VWXJ.PDF?Dockey=P100VWXJ.PDF>.

<sup>21</sup> See Letter from Concerned Citizens of W. Badin to U.S. EPA Off. of General Counsel, External Civ. Rts. Compliance Off. (Mar. 28, 2018), [https://www.epa.gov/system/files/documents/2025-04/01r-18-r4-complaint-mfr\\_redacted.pdf](https://www.epa.gov/system/files/documents/2025-04/01r-18-r4-complaint-mfr_redacted.pdf) (referencing prehearing statement filed in North Carolina Office of Administrative Hearings challenging Alcoa’s 2017 NPDES permit).

<sup>22</sup> SELC, *Settlement Puts Lake, Industrial Site on Path to Clean Up* (June 6, 2019),

<https://www.selc.org/news/settlement-puts-lake-industrial-site-on-path-to-clean-up/> [<https://perma.cc/3FEG-C54R>].

<sup>23</sup> See Badin Bus. Park, *Update on Demolition Activity at Badin Business Park (August 2025)* (August 13, 2025), <https://badinbusinesspark.com/update-on-demolition-activity-at-badin-business-park-august-2025/>.

## II. Legal Background: DEQ's Obligations under Title VI & Executive Order 292

Notwithstanding recent federal executive actions attacking disparate impact liability, DEQ is still bound by EPA's implemented civil rights regulations. Title VI of the Civil Rights Act of 1964 states, "[n]o person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."<sup>24</sup> EPA's implementing regulations further provide "recipient shall not use criteria or methods of administering its program or activity which have the effect of subjecting individuals to discrimination because of their race, color, national origin, or sex."<sup>25</sup> DEQ, as a recipient of EPA funding, is still bound by these regulations.

Recipients of financial assistance from EPA are bound by the agency's Title VI regulations and must therefore ensure that none of its programs or activities, regardless of intent, have the effect of racial discrimination.<sup>26</sup> It has long been EPA's policy to consider the cumulative effect of environmental and nonenvironmental harms when determining whether a recipient's action had the "effect" of causing discrimination in violation of Title VI.<sup>27</sup> This calls for considering the particularized, local harm posed to protected communities.

Recipients must also "take reasonable steps to ensure" that people with Limited English Proficiency ("LEP") have access to the recipient's programs.<sup>28</sup> Longstanding, federal government-wide guidance explains that permitting agencies have an obligation to communicate information about potential exposure to hazardous substances or airborne pollutants to LEP individuals.<sup>29</sup>

As a recipient of financial assistance from EPA, DEQ must comply with Title VI regulations. EPA regulations still prohibit unintentional discrimination in the use of federal funding. Agency regulations, and their binding obligations, cannot be undone by executive order.<sup>30</sup> Therefore, DEQ still has a regulatory mandate to prohibit activities that have the effect of discrimination.

Moreover, North Carolina and DEQ have several mandates to consider disproportionate harms to underserved communities. North Carolina Executive Order ("EO") 292 directs cabinet agencies, which include DEQ, to consider the "just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, or

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<sup>24</sup> 42 U.S.C. § 2000d.

<sup>25</sup> 40 C.F.R. § 7.35(b).

<sup>26</sup> *Id.*

<sup>27</sup> See, e.g., EPA, *U.S. EPA's External Civil Rights Compliance Office Compliance Toolkit 2* (2017), <https://www.epa.gov/system/files/documents/2022-06/fy23-24-oej-ecrco-draft-npg.pdf> [<https://perma.cc/W73U-6UB3>].

<sup>28</sup> 69 Fed. Reg. 35602, 35603 (June 25, 2004), <https://www.govinfo.gov/content/pkg/FR-2004-06-25/pdf/04-14464.pdf>.

<sup>29</sup> *Id.* at 35606.

<sup>30</sup> Multi-State Guidance Affirming the Importance and Legality of Environmental Justice Initiatives 3 (2025), <https://www.mass.gov/doc/multi-state-guidance-affirming-the-importance-and-legality-of-environmental-justice-initiatives/download> ("[T]he President cannot alter the laws passed by Congress, nor can his executive orders or agency memoranda change the protections afforded by the Constitution or state law.").

Tribal affiliation,” in agency policies and programs.<sup>31</sup> The EO further states that agencies should “consider public health impacts in their permitting, policy actions, and agency programs to the furthest extent permissible by law.”<sup>32</sup>

DEQ drafts its Community Profiles “to encourage comments and suggestions from the surrounding community, industry, and environmental groups throughout the comment period.” It does so, in part, in compliance with its Title VI obligations. DEQ has made it abundantly clear, to the dismay of many advocates and community members, that it does not consider the findings of its community profiles in permitting decisions. Notwithstanding, these reports provide meaningful data on the sociodemographic and health of the community and digestible information about the permitting activity. This information allows communities and advocates to more deeply engage in the permitting process. Publishing these reports is in line with Title VI and EO 292, as it helps inform communities and industry about the potential local impact of the government’s permitting decision.

Recent federal executive orders and guidance documents attempting to claw back civil rights protections, and directing agencies to no longer enforce civil rights laws, do not remove DEQ’s regulatory obligations under Title VI. Executive orders and agency guidance are not binding law and, therefore, cannot preempt statutes and regulations that prohibit discrimination in the use of federal funds by recipients. The federal government has made its hostile stance against environmental justice and racial equity clear. It will likely continue to publish documents that push the bounds of executive authority and contradict binding law. Notwithstanding, DEQ should, in compliance with its civil rights obligations, not only continue to publish community profiles, but it should use the findings of those reports to assure that overburdened communities are not further inundated with pollution.

As stated above, after decades of Alcoa’s intentional discrimination, the town of Badin remains largely segregated today—West Badin remains predominantly African American. Research and data demonstrate poor health, economic, and educational outcomes for community members in West Badin.<sup>33</sup> Moreover, the majority of Alcoa’s largest dumping sites are located West Badin. These outcomes demonstrate the cumulative impact of the harms in the predominantly African American community of West Badin, which should be considered in this permitting action under Title VI.

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<sup>31</sup> Exec. Order No. 292, *Advancing Environmental Justice for North Carolina* §§ 6 (Oct. 24, 2023).

<sup>32</sup> *Id.* § 10.

<sup>33</sup> See McClure *supra* note 14; U.S. Census Bureau, “Hispanic or Latino, and Not Hispanic or Latino by Race,” Decennial Census, Dec Demographic And Housing Characteristics at Table P9; U.S. Census Bureau, U.S. Dept. of Comm., Ratio of Income to Poverty Level in the Past 12 Months, American Community Survey, ACS 5-Year Estimates Detailed Tables at Table C17002, <https://data.census.gov/table/ACSDT5Y2023.C17002?t=Income+and+Poverty&g=1500000US371679302001,371679302003> (last accessed on 12 Aug 2025); U.S. Census Bureau, U.S. Dept. of Comm., Educational Attainment for the Population 25 Years and Over, American Community Survey, ACS 5-Year Estimates Detailed Tables at Table B15003, <https://data.census.gov/table/ACSDT5Y2023.B15003?t=Educational+Attainment&g=1500000US371679302001,371679302003> (last accessed on 12 Aug 2025) (showing The West Badin block group had 23% of the population with less than a HS degree and only 7% in East Badin).



### III. New Permit Recommendations

Our recommendations, outlined in detail below, provide DWR with an opportunity to remedy the current permit's shortcomings to ensure that it is protective of public health, water quality, and the environment. Importantly, we do not support DWR renewing NPDES permits at this facility in perpetuity, but instead, urge DWR to work towards realizing the NPDES program's ultimate goal of eliminating discharges of pollutants altogether. In the meantime, we urge DWR to incorporate the following recommendations.

- a. **The new permit should include the details of enforcement consequences if Alcoa's BBP continues to use a laboratory without sufficient test sensitivity to report results for cyanide down to the permit limit of 5 micrograms/liter ("µg/L").**

State and federal law, as well as the current NPDES permit, mandate that Alcoa's BBP use a laboratory with a testing method that is "sufficiently sensitive," meaning that the equipment or procedure used by the certified laboratory can detect and report pollutant concentrations down to or below the permit level.<sup>34</sup> The draft permit outlines this requirement using the same language provided in the 2019 permit:

The permittee shall use sufficiently sensitive test procedures approved under 40 CFR part 136 for the analysis of pollutants. A method is "sufficiently sensitive" when: (1) The method minimum level ML) is at or below the level of the effluent limit established in the permit for the measured pollutant or pollutant parameter; or (2) the method has the lowest ML of the analytical methods approved under 40 CFR part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter.<sup>35</sup>

Alcoa's BBP has repeatedly submitted results for their Discharge Monitoring Reports where it used laboratories with reporting limits for cyanide higher than 5 µg/L, which is in violation of the permit as well as supporting law. The violation of any permit condition is grounds for the agency to act:

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.<sup>36</sup>

Despite the authority to implement enforcement action or terminate, revoke, reissue, modify, or deny permit renewal applications due to repeated violations, DWR has failed to take any meaningful steps to rectify this behavior. These violations have real consequences for water quality. When Alcoa's BBP reports non-detects for cyanide at <6 µg/L, it hides exceedances between 5 µg/L (the permit limit) and 6 µg/L. Then, to calculate monthly averages, Alcoa's BBP is entering the non-detect results as zeroes, significantly skewing the

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<sup>34</sup> 40 C.F.R. § 136.1(c); *id.* § 122.44(i)(1)(iv)(A) (defining sufficient sensitivity).

<sup>35</sup> See, e.g., Dept. Env't Quality, Draft NPDES Permit Renewal, NPDES Permit NC0004308 at 3 (July 2, 2025).

<sup>36</sup> *Id.* 40 C.F.R. § 122.41(a).

monthly average. While testing for cyanide down to 5 µg/L is not possible for every lab, there is no reason Alcoa's BBP cannot be required to seek out labs that do have this capability.

In the new permit, we urge DWR to include details of enforcement consequences if Alcoa's BBP continues to use a laboratory without sufficient test sensitivity to report results for cyanide down to the permit limit. Additionally, the new permit should clarify that Alcoa's BBP must not allow the substitution of zeros for non-detect values in calculating monthly averages. Instead, non-detect values should be reported as one-half the quantitation limit. For example, if Alcoa is using a detection sensitivity of 6 µg/L, a non-detected value should be recorded as 3 µg/L; if using the required sensitivity of 5 µg/L, a non-detected value should be recorded as 2.5 µg/L. This approach incentivizes Alcoa to seek out laboratories with the lowest detection limit possible, providing for more accurate and robust cyanide measurements in the facility's discharges.

- b. The new permit should include a framework that allows for both increasing and decreasing the monitoring frequency at Outfall 005 based on sampling results – rather than just providing a pathway to reduced monitoring.**

In the draft permit, Footnote 4 under Outfall 005's Effluent Limitations and Monitoring Requirements explains if at least 24 fluoride and cyanide analyses (over a minimum of one year) show non-detect, Alcoa's BBP may submit a written request for DWR to reevaluate sampling frequency. We support building adaptivity and flexibility into the NPDES permit so that it can effectively respond to conditions at the site. However, it should work in both directions. As currently written, this condition appears to be designed only to ease Alcoa's sampling burden rather than ensure sampling is representative and protective of local water quality and communities. We recommend that the frequency of monitoring at Outfall 005 should not just contain an option to ramp down, but also a requirement to ramp up to an increased, regular testing schedule set by the permit if sampling results show repeated violations.

It is important to emphasize the importance of requiring increased, *regular* testing (e.g., weekly) of outfalls in a way that is representative of impacts on waters. In the past, the use of monthly averages coupled with discretion as to when the samples are taken has allowed Alcoa's BBP the flexibility to manipulate the monthly average by sampling only until the average drops below permit limits. For example, when cyanide was measured at 37 µg/L in December 2021 at Outfall 013, which flows into the public swimming area, eight more samples were taken later that month. Those eight samples were all reported as <6 µg/L (and were converted to 0 µg/L for calculating the monthly average). It is not coincidental that 37 µg/L divided by 9 is 4.11 µg/L, just below the permit's monthly average limit of 5 µg/L. Cyanide was also elevated at Outfall 005 in December 2021, with three samples exceeding the monthly limit of 5 µg/L. After those three samples were taken, six more samples were taken to lower the average below the monthly limit.

40 CFR 122.48(b) lays out that NPDES permits “shall specify...required monitoring including type, intervals, and frequency sufficient to yield data which are representative of the monitored activity including, when appropriate, continuous monitoring.” While we are not asking for continuous monitoring, we are asking that the permit conditions prioritize accuracy and representativeness of sampling over any inconvenience posed to the facility for more frequent testing.

- c. DWR should increase sampling frequency for DOC, pH, and Total Hardness for Outfalls 005, 011, 012, 013, 019; stormwater Outfalls 002, 004, 017, 018, 020, 022, and 023; and instream monitoring at the mixing zone – to ensure sampling captures a wide range of seasonal and flow conditions.**

Because the toxicity of aluminum can vary depending on certain water chemistry parameters, the EPA recommends that site-specific criteria for aluminum are developed based on the site’s Dissolved Organic Carbon, pH, and Total Hardness.<sup>37</sup> We are pleased to see DWR include the testing of these parameters in the draft permit and urge DWR to use the test results to develop site-specific numeric effluent limits for the discharge of aluminum from the facility’s outfalls.

However, the frequency (semi-annual) at which the draft permit requires testing for Dissolved Organic Carbon, pH, and Total Hardness hardly seems sufficient to capture fluctuations in these parameters due to seasonal changes and flow conditions. The United States Geological Survey, in collaboration with the Massachusetts Department of Environmental Protection (“Mass DEP”) analyzed these parameters monthly to inform site-dependent aluminum concentrations that would be protective of ecological health<sup>38</sup>, and Mass DEP recommends “...a minimum of 20 sampling events over two years spaced at least monthly apart must occur to capture temporal variability.”<sup>39</sup>

Thus, DWR should increase the current monitoring frequency from semi-annually to monthly to properly inform the safe site-specific limit for aluminum discharges. Additionally, the testing of Dissolved Organic Carbon, pH, and Total Hardness should be paired with aluminum testing, which should also increase to monthly.

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<sup>37</sup> See EPA, *Fact Sheet: Final 2018 Aquatic Life Ambient Water Quality Criteria for Aluminum in Freshwaters* (Dec. 12, 2018), <https://perma.cc/L8WG-T4X4>.

<sup>38</sup> See generally David Armstrong et al., *Surface-water-quality Data to Support Implementation of Revised Freshwater Aluminum Water-quality Criteria in Massachusetts, 2018-19* at 85 (Feb. 2023), <https://www.epa.gov/sites/default/files/2018-12/documents/aluminum-criteria-final-factsheet.pdf> [<https://perma.cc/2DH7-73KR>].

<sup>39</sup> Mass. Dep’t of Env’t Prot., *Fresh Water Aquatic Life Water Quality Criteria for Aluminum* (Dec. 2021), <https://www.mass.gov/doc/fresh-water-aquatic-life-water-quality-criteria-for-aluminum-application-of-the-aluminum-criteria-calculator-for-national-pollutant-discharge-elimination-system-npdes-and-massachusetts-surface-water-discharge-swd-permits-cn-5600/download> [<https://perma.cc/AM3U-N3EH>].

- d. DWR should require that Alcoa's BBP add signage to Outfall 013, consistent with the other outfalls discharging to Badin Lake (011 and 012), and eliminate the mixing zone at Outfall 012. These should be interim measures until DWR is able to remove or divert the contaminated water from discharging to Badin Lake altogether.**

We are pleased to see that the draft permit requires signage alerting boaters, fishers, and swimmers to the existence of Outfalls 011 and 012. Because Outfall 013 is also located in very close proximity to popular swimming areas in Badin Lake, we request that the new permit require Alcoa's BBP to add another sign at Outfall 013. It is imperative that all signs provide information in both English and Spanish.

Special Condition C(2) in the draft permit requires "signage along the lake shore that identifies Outfalls 011 and 012 as a discharge point within 30 days of the effective permit date." Yet, it does not instruct Alcoa's BBP to identify the specific chemicals to which the public may be exposed. People should have the right to know what pollutants the state has allowed Alcoa to discharge before deciding whether to swim, fish, or recreate in that water. Therefore, we recommend adding a provision to the signage requirements mandating Alcoa's BBP list the contaminants that have been present in these outfalls to keep the public better informed of any potential risks and increase transparency. DWR could take this one step further by making additional educational information available through a QR code on the signs, which could link to real-time discharge data, details on the fish-consumption advisory, and safety information for swimmers and boaters to consider.

In addition to the added signage, we recommend eliminating the use of the "mixing zone" at Outfall 012, which allows Alcoa to discharge up 50 times the current cyanide water quality standard into the middle of Badin Lake's public access swimming area. According to EPA guidance, mixing zones are not appropriate in instances where they contain pollutant concentrations that may "be lethal to passing organisms" or "cause significant human health risks considering likely pathways of exposure."<sup>40</sup> Even low levels of cyanide have been shown to induce toxicity in fish and other aquatic species, and swimmers recreating in this area risk exposure through ingestion of lake water, skin contact, or inhalation of water spray. These concerns warrant the elimination of Outfall 012's mixing zone.

We consider the added signage and elimination of the mixing zone to be interim steps to protect water quality and public health while DWR works towards realizing the fundamental goal of the NPDES program to eliminate the discharge of pollutants.<sup>41</sup> In accordance with this goal, we urge DWR to work towards the elimination of outfalls discharging into Badin Lake altogether.

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<sup>40</sup> EPA, *Water Quality Standards Handbook Chapter 5: General Policies* 11 (Sept. 2014), <https://www.epa.gov/sites/default/files/2014-09/documents/handbook-chapter5.pdf> [<https://perma.cc/N666-SASY>].

<sup>41</sup> See, e.g., 33 U.S.C. § 1251(a) (explaining that the purpose of the Clean Water Act "is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" and that "it is the national goal that the discharge of pollutants into the navigable waters be eliminated").

**e. The new permit should include monthly average sampling effluent limits for fluoride and cyanide at Outfall 011.**

The draft permit entirely omits monthly average limits for cyanide and fluoride at Outfall 011. We urge DWR to include monthly averages for these parameters for consistency with the other outfalls and so that the agency has a mechanism to hold Alcoa's BBP accountable if elevated levels of these pollutants are discharged.

**f. DWR should develop a plan with DWM to ensure Alcoa's BBP facility removes the contaminated source material, instead of leaving the material on-site to continue to cause exceedances and high concentrations of pollutants in discharges.**

The community was alerted that Alcoa's BBP facility had another exceedance of the monthly average limit for fluoride at Outfall 005 in May 2025. Alcoa attributed the exceedance to the intense storm events and the demolition of the facility's potrooms. This exceedance highlights an inextricable link: the pollution discharged through Alcoa's BBP outfalls is a result of contaminants leaching from the solid and hazardous waste onsite.

Despite this link, the site's pollutant discharges and waste are governed under separate regulatory regimes and permits, which has siloed management of the site. The Resource Conservation and Recovery Act ("RCRA") governs the solid and hazardous waste at Alcoa's BBP while the Clean Water Act ("CWA") and its NPDES program govern the discharge of pollutants into Badin Lake and Little Mountain Creek. The clear connection between the waste and the water highlights the need for these programs to work together. To actually reduce or eliminate the discharge of pollutants, DWR must engage with DWM to ensure DWM is working towards either removal of the hazardous waste at Alcoa's BBP or a containment and full treatment of the site and unlined dumps.

To better translate DWM and DWR's coordination into enforceable permit terms, DWR should (a) populate the parameter table for each outfall in the draft permit with a full list of Chemicals of Potential Ecological Concern (COPECs) identified through RCRA Ecological Risk Assessments (ERA); (b) set water-quality-based effluent limits and stormwater benchmarks using ERA-derived exposure point concentrations (EPCs) and ecological screening values (ESVs); (c) activate an automatic permit re-opener whenever RCRA data identify a new or elevated COPEC or otherwise indicate a threat to the Badin Lake and Little Mountain Creek; and (d) tie corrective action milestones like landfill cap upgrades, ditch source controls etc., to an enforceable compliance schedule in the permit.

Additionally, we urge DWM and DWR to conduct a cumulative impact assessment. EPA defines cumulative impacts as the totality of exposures to combinations of chemical and non-chemical stressors and their effects on health, well-being, and quality of life, considering exposures across time, multiple sources, multiple pathways, and community vulnerability.<sup>42</sup> For decades, the Alcoa Badin landfill accepted both municipal waste and hazardous waste

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<sup>42</sup> See, e.g., EPA, *Cumulative Impacts Explained* (Nov. 21, 2024), <https://www.epa.gov/cumulative-impacts/cumulative-impacts-explained> [<https://perma.cc/KL8J-FZLE>.]

from Alcoa, which created legacy contamination; together with current and future discharges from multiple outfalls, future weather and flow conditions that intensify exposures, and community use of local waters, these factors combine to create exactly this kind of cumulative burden. A parameter-by-parameter permit misses the combined and interacting effects of pollutant mixtures such as cyanide, fluoride, PCBs, PAHs, and metals across the creek and lake. The cumulative assessment should therefore integrate data from both DWM and DWR programs, be informed by meaningful community engagement and documented exposure patterns (for example, subsistence fishing and shoreline use), and then be used to set monitoring frequencies, limits, and adaptive management actions.

**g. NC DEQ and DWR should continue to enhance data transparency, accessibility, and community engagement.**

NC DEQ should require a public-facing, integrated RCRA and NPDES data dashboard, administered by the Department rather than the permit holder. To operationalize this recommendation, the Department can build the dashboard on top of its existing ‘Sampling Test Results and Related Resource Data’ on the Alcoa-Badin Business Park Information Page<sup>43</sup> and convert it into a single cross-program interactive dashboard that (1) maps every outfall and drainage ditch and shows the receiving waters they flow into; (2) displays time-series trends for all monitored analytes, including cyanide, fluoride, PCBs, PAHs, metals, total suspended solids, hydrogen-ion concentration (pH), and hardness, with clear indicators when benchmarks or water-quality-based effluent limits are exceeded; (3) provides context for storm first-flush and low-flow periods that historically drive peak exposures; (4) publishes electronic discharge monitoring reports, whole-effluent toxicity test results, RCRA sampling results, and fish-tissue data within a set time frame; (5) offers downloadable raw data in open formats with quality-assurance and quality-control notes, method detection and reporting limits, and units; (6) presents bilingual, plain-language advisories for fishing and recreation; (7) is mobile-friendly and accessible; and (8) allows residents to opt in to text-message and email alerts when thresholds are exceeded.

West Badin residents and the North Carolina Environmental Justice Network view this level of transparency, accessibility, and engagement as the single most important change because it reduces information asymmetry; enables independent verification; supports evaluation of cumulative effects across multiple outfalls and legacy sources; provides early warning to families who rely on local waters; and allows residents, regulators, and the company to confirm whether landfill and plant controls are actually reducing pollutant loads over time.

#### **IV. Conclusion**

DWR is authorized to protect surface water quality, not issue permits for an industrial facility that is degrading Badin Lake and Little Mountain Creek and shirking its

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<sup>43</sup> NC DEQ, *Alcoa - Badin Business Park Information*, <https://www.deq.nc.gov/about/divisions/waste-management/hazardous-waste-section/alcoa-badin-business-park-information> [<https://perma.cc/6364-CUHH>] (last visited Aug. 18, 2025).

responsibility to remediate its hazardous wastes. The fact that Alcoa's BBP has an NPDES permit should not be used as a way to avoid taking accountability for its pollution.

Implementing our recommendations would strengthen the permit and make it more protective of water quality and environmental health in the region. These recommendations would also improve the public's confidence in the efforts being made to address the hazardous waste on site. We thank you for your hard work on this issue and for your service to the people and ecosystems of North Carolina.

Sincerely,

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/s/ Mark Lamendola, Student Consultant  
/s/ Chloe Wetzler, Student Attorney  
Duke Environmental Law and Policy Clinic

/s/ Jasmine Washington  
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/s/ Anne Harvey David  
/s/ Aiswarya Murali  
/s/ James Huey  
Southern Coalition for Social Justice

/s/ Edgar Miller  
/s/ Stephanie Stephens  
/s/ Nicole Eastman  
Yadkin Riverkeeper, Inc.

/s/ Richard Leak  
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Concerned Citizens of West Badin

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