October 31, 2019

Policy Office
Department of Environmental Protection
Rachel Carson State Office Building
P.O. Box 2063
Harrisburg, PA 17105-2063
Attn: Jessica Shirley, Director

Re: Pennsylvania Regional Haze Best Available Retrofit Technology
49 Pa. Bull. 5065 (Aug. 31, 2019)

Dear Director Shirley:

The National Parks Conservation Association, Sierra Club, Clean Air Council, and Earthjustice submit the following comments on the Department's proposed rule for the state implementation plan for regional haze in Pennsylvania.[1] The Department's proposal would revise determinations for best available retrofit technology (BART) for several sources in Pennsylvania. However, the Department must revise its proposal to, among other things, better document the Department's conclusions and better inform the public, reconsider at least one source-specific BART determination, and present a complete analysis for electric generating units.

I. Background

A. Conservation Groups

[1] The Department extended the time for submitting these comments to October 31, 2019 by e-mail from Jesse Walker, Assistant Counsel, dated September 20, 2019.

The National Parks Conservation Association (NPCA) is a national nonprofit organization with 1.4 million members nationwide dedicated to protecting and enhancing America's national parks for present and future generations. NPCA advocates for national parks, educates decision-makers and the public about the importance of preserving the parks, and works to strengthen and uphold the laws that protect the parks. NPCA has 17,304 members in Pennsylvania that care deeply about air quality and protecting vistas at the region's Class I areas, including Shenandoah National Park. Moreover, NPCA members value the local economies supported by recreation and tourism at national parks, and the health of park visitors, staff and neighboring communities who breathe the same pollutants that mar the scenic views at our parks.

The Sierra Club is a national nonprofit environmental organization with over 775,000 members nationwide, including 30,579 in Pennsylvania. The Sierra Club's mission is to explore, enjoy, and protect the wild places of the Earth, to practice and promote the responsible use of the Earth's resources and ecosystems, to educate and enlist humanity to protect and restore the quality of the natural and human environment, and to use all lawful means to carry out those objectives.

The Council is a non-profit environmental organization headquartered in Philadelphia, Pennsylvania. The Council maintains an office in Pittsburgh. For 50 years, the Council has worked to improve air quality across Pennsylvania. The Council has members throughout the Commonwealth who support its mission to protect everyone's right to a healthy environment, including members in Allegheny County. The Council has approximately 35,000 activist members.

Earthjustice is a non-profit public interest law firm dedicated to protecting the magnificent places, natural resources, and wildlife of this earth, and to defending the right of all people to a healthy environment.

B. Regional Haze and Best Available Retrofit Technology

In 1977, Congress amended the Clean Air Act to provide national parks and other "mandatory Class I Federal areas" with the highest degree of protection from visibility impairment. 42 U.S.C. § 7491. Congress set a national goal of preventing and remedying all human-caused visibility impairment at national parks and other Class I areas. *Id.* § 7491(a)(1). This national goal is to be achieved through, among other things, the installation of BART controls at certain "major stationary sources," whose emissions "may reasonably be anticipated to cause or contribute to" visibility impairment at Class I areas. *Id.* § 7491(b)(2)(A); *see also* 40 C.F.R. § 51.308(e).

In 1999, EPA issued the Regional Haze Rule to address visibility impairment caused by "numerous anthropogenic sources located over a wide geographic area." 40 C.F.R. §§ 51.301. The goal of the Regional Haze Rule is to eliminate human-caused visibility impairment at all Class I areas. 40 C.F.R. § 51.308(d)(1). To accomplish this goal, the states or EPA must develop regional haze plans for each state that include BART and a long-term strategy to ensure reasonable progress toward the natural visibility goal. *Id.* §§ 51.308(d)(1), (d)(3).

Under the Clean Air Act and EPA regulations, sources must apply BART, which means "an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction." 40 C.F.R. § 51.301. In determining BART, EPA and state implementing agencies such as the Department must take into consideration:

> the costs of compliance, the energy and nonair quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology[.]

42 U.S.C. § 7491(g). In its BART Guidelines, EPA describes the requirements for a five-step case-by-case analysis to determine BART. 40 C.F.R. Part 51, Appendix Y. These steps are as follows:

- identify all available retrofit control technologies;
- eliminate technically infeasible options;
- evaluate control effectiveness of remaining control technologies;
- evaluate impacts and document the results; and,
- evaluate visibility impacts.

Id. at BART Guidelines, § IV.D.

C. The Pennsylvania Regional Haze State Implementation Plan

In 2010, the Department submitted revisions to the Pennsylvania Haze Plan.[2] The submission identified 34 Pennsylvania sources that are subject to BART.[3] EPA published its proposed approval of the 2010 Haze Plan on January 26, 2012 (77 Fed. Reg. 3984). National Parks Conservation Association, Sierra Club, Clean Air Council, and Earthjustice filed comments[4] and EPA issued its final approval of the final 2010 Haze Plan on July 13, 2012 (77 Fed. Reg. 41,279).

After environmental and public health groups petitioned for review of the final 2010 Haze Plan,[5] EPA took a voluntary remand of the rule.[6] On April 13, 2014 (79 Fed. Reg. 24,340), EPA reissued its final limited approval of the 2010 Haze Plan. Environmental and public health groups again petitioned for review, and after briefing and argument, the Third Circuit vacated EPA's rule to the extent it approved Pennsylvania's source-specific BART analysis and remanded it to EPA. *Nat'l Parks Conservation Ass'n v. EPA*, 803 F.3d 151 (3d. Cir. 2015). Among other things, the Court found that EPA failed to provide a basis for its conclusions regarding possible upgrades of control technologies, provided "scant justification" for its

[2] 77 Fed. Reg. at 3989.
[3] 2010 Haze Plan Narrative at 55.
[4] EPA-R03-OAR-2012-0002-0033 (Feb. 12, 2012).
[5] No. 12-3534 (3d Cir.).
[6] *Id.* ECF No. 003111427503.

position regarding Pennsylvania's flawed BART analyses, applied a flawed metric for cost-effectiveness, and failed to calculate cumulative visibility impacts. *Id*. at 161-67.

In response to the remand, the Department proposed the 2019 Haze Plan, 49 Pa. Bull. 5065. Among other things, the proposal describes the Department's approach to BART, lists remaining sources subject to BART, and determines BART for these sources.

II. Comments

A. The Department Should Provide a Complete Accounting of BART-Eligible Sources

In its 2010 Haze Plan, the Department identified 34 BART-eligible sources.[7] But in the current proposal, the Department only identifies three sources for which it reviews BART.

Given the critical role that BART plays in reducing regional haze, the remand of EPA's approval of the Department's prior haze plan for errors in BART, we request that the Department provide, in its response to comments, a list of the 34 sources identified in the 2010 Haze Plan showing:

- which are retired;
- which are electric generating units covered for nitrogen oxides (NOx) and sulfur dioxide (SO_2) by the Cross State Air Pollution Rule "better than BART," for which we also request that the Department show annual emissions by source and emissions controls by source;
- which electric generating units must be analyzed for particulate matter BART; and
- which are above the 0.2 deciview threshold either for particulate matter for electric generating units or for the combination of SO_2, NOx, and particulate matter for non-electric generating units.

B. The Department Fails to Document Important Aspects of the 2019 Haze Plan

Control efficiencies are a critical aspect of any BART analysis, which should document control efficiencies at the most stringent control levels.[8] However, the 2019 Haze Plan offers little to no documentation to support control efficiency figures claimed by the facilities, which the Department appears to accept at face value.

Further, there does not appear to be any documentation (e.g., vendor quotes, actual costs from a similar facility, generally accepted estimates) provided to support any of the capital control costs provided by any of the facility BART determinations, or documentation that the Department questioned any of these costs. The Department may treat any confidential business

[7] 2010 Haze Plan Narrative at 55.

[8] *See* the final BART Rule at 70 Fed. Reg. 39,166: "It is important, however, that in analyzing the technology you take into account the most stringent emission control level that the technology is capable of achieving."

information as such in accordance with its procedures, but such information must at least be provided to the Department for its review.[9]

For instance, the entire Lafarge Whitehall cost analyses consists of five summary tables, with no documentation of capital or other costs. While Lafarge offers operating life for three of these cost summaries—14 years for selective noncatalytic reduction optimization and upgrading the existing dry sorbent injection system, and 15 years for a wet scrubber—these equipment lifetimes are low in comparison to those assumed in many other BART analyses.[10] Neither Lafarge nor the Department offers any justification for these reduced lifetimes, or why they should be distinguished from those typically used in the first planning period. Short equipment lifetimes such as these serve to greatly increase annualized costs.

In addition, Lafarge uses a capital recovery factor of 0.944 in its cost analysis of its existing dry absorbent addition using hydrated lime, which appears to be inconsistent with its assumed 14 year equipment lifetime and any reasonable interest rate. This figure should have been 0.0944, which would have resulted in an annualized capital cost of $28,421, instead of Lafarge's figure of $284,213. This would have reduced the total annual costs to $329,494, which would in turn have reduced the dry sorbent injection cost effectiveness from $1,531 to $824.

Lafarge also assumes a 2% charge for insurance in its cost summaries, while EPA's Control Cost Manual specifies that charge is 1%. This can have a significant effect. For instance, increasing the insurance charge from 1% to 2% adds $746,970 to the total indirect costs for its wet scrubber cost.[11] Documentation of these and the above control costs is a fundamental aspect of a BART evaluation, which the Department should confirm by its own review. The Department should correct all the errors in its BART analyses, ensure they conform to the Control Cost Manual, and formally reconsider all of its BART analyses.

Finally, the Department has not documented a key aspect of its proposal regarding particulate matter from electric generating units--that "there were no BART- eligible EGUs that exceeded the 0.2 deciview threshold for PM impacts." The Department provides (at 9) only a general statement based on its review of MANE-VU modeling regarding Penn State and National Weather Service data. Instead, the Department must document where the actual modeling upon which it relies can be found. Further, the Department must provide a sector-by-sector analysis of how its current emissions inventory differs from that assumed in the MANE-VU modeling, and how those differences may have impacted that modeling.

C. The Department Should Not Consider Visibility Perceptibility in Selecting Potential Controls

[9] For instance, Lafarge states on pdf page 51, Appendix B1, in relation to its cost summary for a LNB for Kiln 3, "Cost of equipment based on quotes obtained for internal capital request project in 2006 and again in 2011."

[10] For example, the typical equipment lifetime assumed for dry sorbent injection, scrubbers, selective noncatalytic reduction, and selective catalytic reduction installations for coal-fired power plants in the regional haze program has been 30 years. EPA has consistently taken the position that if this lifetime is not utilized, the units in question should execute an enforceable commitment to retire earlier.

[11] *See* the EPA Air Pollution Control Cost Manual, Chapter 2, section 2.6.5.8.

The Department, Lafarge, Lehigh, and Monroe all appear to consider visibility perceptibility (1 – 2 dv) in BART analyses.[12] EPA has made it clear in the BART Rule that perceptibility is not a consideration in the selection of potential controls.[13] Consequently, the Department should make it clear in its 2019 Haze Plan that perceptibility is not a consideration in its BART analyses.

D. The Department Must Reconsider the BART Determination for Lehigh Evansville

The Lehigh Evansville Cement Plant has a maximum base case total visibility impact of 0.444 dv at the Shenandoah National Park and 0.382 at the Brigantine Wildlife Refuge.[14] At the plant, Kilns 1 and 2 require review for BART.

The Lehigh plant installed selective noncatalytic reduction (SNCR) systems on both Kilns 1 and 2, but dismantled them due to high maintenance issues. However, subsequent technical advancements in SNCR applied to kilns have caused Lehigh to consider it as potential BART controls. Lehigh has installed dry sorbent injection on both kilns to control SO_2.

Lehigh incorporates a BART visibility threshold of 0.5 deciview into its analyses, citing to it in several places as a partial justification for no further controls.[15] However, the Department has determined that a lower threshold of 0.2 deciview is appropriate. Consequently, the Department should not approve any Lehigh analysis using an inconsistent and therefore improper threshold.

For nitrogen oxides, the Department considers two types of SNCR systems redesigned from that which was dismantled by Lehigh: mid-kiln injection SNCR and riser injection SNCR.[16] However, the Department only considers reduction efficiencies of 20% and 10%, respectively, and does not provide any documentation to support these choices.[17] These figures are likely inappropriately low.[18] The Department should therefore provide documentation to support these figures or re-analyze SNCR using higher efficiencies from similar SNCR cement plant

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[12] *See, e.g.*, the Lehigh Cement BART analysis memo, page 7. Also, the Department appears to consider perceptibility on page 7 of its Lehigh BART memo when it quotes from EPA's Visibility Monitoring Guidance. This quotation is out of context; EPA was explaining why the deciview scale is used, not that BART should consider perceptibility.

[13] *See* 70 Fed. Reg. 39,129: "[W]e disagree that the degree of improvement should be contingent upon perceptibility. Failing to consider less-than-perceptible contributions to visibility impairment would ignore the CAA's intent to have BART requirements apply to sources that contribute to, as well as cause, such impairment."

[14] *See* Table 4 of Appendix C2 - PADEP BART Review Memo Lehigh Evansville.

[15] *See, e.g.*, the Lehigh Evansville Cement BART analysis pages 1-2, and 3-3.

[16] *See* page 8 of the Lehigh Evansville Cement plant BART review memo.

[17] The Department states these efficiencies were provided by Lehigh, but as indicated, Lehigh's BART report dismisses SNCR types as infeasible. This should be clarified.

[18] *See* AAPCA 2016 Spring Meeting, Panel: NOx Controls Updates, April 28-29, 2016, Timothy L. Matz, Corporate Director of Environmental Affairs Lehigh Hanson, Inc: "SNCR Results in Reduction in NOx -Typically between 35% and 65%." Page 11. https://www.cleanairact.org/events/documents/AAPCA2016SpringMeeting-postmeeting.pptx. *See also* the presentation NOx Control With SNCR Technology Cement Plants, given by Industrial Accessories Company, page 17: actual SNCR installation efficiencies are cited for many cases and range up to 85%. http://www.iac-intl.com/wp-content/uploads/2016/09/IAC_NOx-Control-in-Cement_SNCR-Technology.pdf.

installations. The Department indicates that the maximum potential visibility improvements from implementing these SNCR technologies at both kilns would be 0.07 dv (mid-kiln injection, Brigantine) and 0.035 dv (riser injection, at both Brigantine and Shenandoah). The Department does not consider either type of SNCR to be BART. Modest improvements in efficiencies (e.g., 30%) are not expected to result in significant visibility improvements over those cited above. However, maximum efficiencies approaching the upper range are expected to result in significant visibility benefits. In addition, the Department's cost-effectiveness calculations of $2,524/ton (mid-kiln injection) and $1,216/ton (riser injection) are well within the range of many controls that were found to be BART in the first planning period. These cost-effectiveness values would further improve with higher removal efficiencies. The Department should also provide documentation for these costs and modeling projections, which are simply summarized in its analysis and do not appear to be present in the Lehigh BART analysis.

Regarding selective catalytic reduction (SCR) for NOx, Lehigh claims "[t]here are no full scale SCR systems in operation at cement kilns in the United States," and dismisses SCR as infeasible.[19] However, as the Department notes, a consent decree required SCR at the Lafarge Joppa plant in Illinois, which is the same type of kiln as that used at the Lehigh Evansville plant.[20] As Lafarge itself noted in its 2014 annual report, SCR "installed at Joppa plant reduced NOx by up to 80%."[21] The Lafarge Holcim[22] cement plant in Midlothian, Texas also installed SCR with a reported efficiency of at least 70%.[23]

The Department did perform a BART analysis assuming the use of SCR, but despite the information cited above, it assumed an efficiency of only 42%. It did not provide any documentation for that figure and otherwise offers no support for the unreasonably low efficiency. The Department calculated a cost-effectiveness of $10,903/ton. The Department projected visibility benefits of 0.145 deciview and 0.148 deciview at Shenandoah and Brigantine, respectively, but again there is no documentation of this modeling. As to this cost-effectiveness and modeling, the Department should also provide documentation in its evaluation, which it simply summarized in its analysis, and which does not appear to be present in the submitted Lehigh analysis.

Thus, the Department should revisit and, as necessary, revise its analysis for SNCR and SCR. We believe that, depending on a complete assessment of SCR, at a minimum, year-round operation of SNCR should be BART. The Department should also revisit and reassess BART controls for particulate matter.

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[19] On page 9 of its Lehigh BART analysis memo, the Department states that "Lehigh evaluated the use of SCR on their two long dry kilns." However, it does not appear to be a part of the Lehigh BART analysis on the Department's website.

[20] *See* https://www.epa.gov/enforcement/lafarge-north-america-inc-clean-air-act-settlement.

[21] *See* Annual Report, Registration Document, Lafarge 2014, page 141. https://www.lafargeholcim.com/sites/lafargeholcim.com/files/atoms/files/03232015-press_publication-2014_annual_report-uk.pdf.

[22] Lafarge and Holcim have recently merged.

[23] *See* https://www.midlothianmirror.com/news/20170718/holcim-makes-environmental-improvements-with-new-regulation-updates.

E. The Department Should Present a Meaningful and Complete Electric Generating Unit Particulate Matter BART Analyses

The Department acknowledges that it must provide a PM BART analysis for the electric generating units covered by Cross State Air Pollution Rule for NOx and SO_2. However, it states only:

> In reviewing the MANE-VU modeling, there were no BART- eligible EGUs that exceeded the 0.2 deciview threshold for PM impacts, using either the Fifth Generation Penn State/National Center for Atmospheric Research Mesoscale Model (MM5) or National Weather Service (NWS) meteorology data.

At 9. Thus, the Department's position is that all of the electric generating units modeled out of PM BART requirements. The Department must describe where that modeling can be found in the technical record, and explain its use of its prior modeling, which is now is quite old. At a minimum, the Department should provide a sector-by-sector analysis of how its current emissions inventory differs from that assumed in the MANE-VU modeling, and how those differences may have impacted that modeling.

F. The Department Should Ensure that the Version of its Haze Plan it Presents to the Public is in Fact the Most Current and Reflects Proper Consideration of Updates and Corrections

From a review of Appendix E, the Department has revised its BART cost-effectiveness calculations in response to the FLM comments. In some cases, the cost-effectiveness values were revised downward quite significantly. In other cases, it does not appear that the Department has actually presented the revised cost-effectiveness figures.[24] However, in either case, it does not appear that the Department has formally reconsidered the BART factors in light of these significant changes to cost-effectiveness.

For example, despite a number of errors identified by the FLMs, which the Department has acknowledged, the Department has not required any revisions to the BART reports by the companies themselves. In addition, the Department revised none of its BART determinations.[25] Lastly, the main body of the 2019 Haze Plan itself has not been revised. The Department states only:

> DEP reviewed the National Park Service cost analyses concerns. The BART determinations remain unchanged following the review of the National Park Service's comments, because after reviewing and updating the cost analyses as suggested, these updates do not change the determinations.

[24] For example, in responding to the NPS's comment concerning the Lehigh Cement SO_2 analysis that it should have used an interest rate of 5.25 – 5.5%, the Department agreed but did not present the revised cost-effectiveness calculation. Instead, it merely stated, "Although each cost effectiveness decreased marginally, the decreases are not significant to alter DEP's original conclusion for each SO_2 control device."

[25] *See, e.g.*, Appendix B2, "Northeast Regional Office Review Memorandum on Lafarge Whitehall Best Available Retrofit Technology Analysis (BART), dated 9/7/2017.

Appendix E at 1. Consequently, the Department did not truly reconsider that application of the BART factors in response to the Third Circuit's remand, and instead must consider these factors and revise the 2019 Haze Plan accordingly.

Conclusion

For the reasons described in this letter, the Department:

- Must provide a complete inventory describing changes in the inventory of BART-eligible sources;
- Must document important aspects of its 2019 Haze Plan, and provide the current version of the Plan to the public;
- Must not consider visibility perceptibility in selecting potential controls;
- Must reconsider its BART determination for Lehigh Evansville; and,
- Must present a complete particulate matter BART analysis for electric generating units.

Thank you for considering our comments on the Department's proposal.

Signed,

/s/
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