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1200 Pennsylvania Avenue, NW  
Washington, DC 20460.

(Submitted electronically at <http://www.regulations.gov>)

**RE: Comments of the National Lime Association on: National Emission Standards for Hazardous Air Pollutants: Lime Manufacturing Plants Amendments, Docket ID No. EPA-HQ-OAR-2017-0015, RIN 2060-AV59**

Dear Sir or Madam:

The National Lime Association (NLA) appreciates the opportunity to comment on EPA's Proposed Rule: National Emission Standards for Hazardous Air Pollutants: Lime Manufacturing Plants Amendments (Proposed Rule). NLA is the trade association for manufacturers of high calcium quicklime, dolomitic quicklime, dead-burned dolomitic lime, and hydrated lime, collectively referred to as "lime." Lime provides cost-effective solutions to many of society's manufacturing and environmental needs. Lime is a chemical without substitute, providing solutions to many of society's environmental problems. Lime is an important ingredient in many other manufacturing processes and industries. It is used in the steel manufacturing process, road building, and the creation of other building products like mortar and plaster. Lime is also a critical component in environmental compliance for many industries, as it is used to purify water and scrub air pollutants from stack emissions.

NLA acknowledges the difficulty of the technical work underlying the Proposed Rule. However, NLA believes that the proposal is deficient in several ways set forth below. These comments reflect NLA's major concerns, as well as more technical issues and corrections. Major concerns include the following:

1. The Clean Air Act does not require EPA to regulate unregulated hazardous air pollutants in this proceeding, and EPA should have determined that such a regulation is unnecessary.

2. EPA has significantly underestimated the costs of compliance with the Proposed Rule, for the industry as a whole, and in particular for the three small businesses that will be impacted. EPA must perform a full analysis of the small business impacts, including a SBREFA panel, before proceeding with the Proposed Rule. The costs to the industry as a whole to comply with the rule include a total capital investment of \$920M for existing lime plants and total annual costs that will likely exceed \$180M per year.<sup>1</sup>
3. If it proceeds with this rulemaking, EPA should authorize plant-wide weighted emissions averaging for all HAPs covered by the rule.
4. Any standard for HCl should be a health-based standard pursuant to Clean Air Act section 112(d)(4).
5. It is unlawful for EPA to use Total Hydrocarbons (THC) as a surrogate for organic hazardous air pollutant (oHAP) emissions in the lime industry, because there is no correlation between oHAP emissions and THC emissions. The Agency should instead issue a more accurate and scientifically sound standard based on aggregated oHAP emissions.
6. EPA should employ an intra-quarry variability factor (IQV) for mercury emissions, and the Agency's own repeated findings that the risks from lime emissions are acceptable with an ample margin of safety means that no basis exists for its "beyond the floor" regulation of mercury.
7. EPA should withdraw its proposed dioxins/furans (D/F) standard and either collect additional data on D/F emissions in the lime industry before proceeding with a new emissions standard or provide the work practice requested by NLA.

NLA supports certain proposed elements of the rule. For example, NLA commends EPA for setting subcategories for HCl, and agrees with EPA that five-year stack testing is an appropriate monitoring requirement.

## PROCEDURAL BACKGROUND

EPA promulgated the *National Emission Standards for Hazardous Air Pollutants for Lime Manufacturing Plants Final Rule* almost two decades ago. 40 CFR §§ 63.7080-7083. In doing so, the Agency noted that: "the purpose of the final NESHAP is to **protect public health** by reducing emissions of HAP from lime manufacturing plants." 69 Fed. Reg. 394, 395 (Jan. 5, 2004) (emphasis added). EPA carefully evaluated the lime manufacturing sector, and regulated HAP emissions by establishing a particulate matter (PM) standard as a surrogate for non-volatile and semi-volatile metal HAPs. The Agency fulfilled its obligations under the Regulatory Flexibility Act and the Small Business Regulatory Enforcement Fairness Act (SBREFA) by reaching out to small lime companies, performing extensive economic analysis on the impacts of the rule, and convening a small business panel with the Small Business Administration (SBA) to

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<sup>1</sup> See Trinity Economic Impact Assessment and Technical Implementation Factors in Appendices A and B.

identify less burdensome alternatives that would still accomplish the Agency's regulatory objectives. The Agency also provided a 60-day comment period.

The Agency's focus was on protecting public health by reducing HAP emissions with controls, but only if such controls were "necessary." EPA considered, but expressly rejected, regulating other HAPs, including the ones at issue in this rulemaking. For example, EPA determined that:

We are not regulating HCl emissions from lime kilns in the final NESHAP. Under the authority of section 112(d)(4) of the CAA, we have determined that no further control is necessary because HCl is a "health threshold pollutant" and HCl levels emitted from lime kilns are below the threshold value within an ample margin of safety.

69 Fed. Reg. at 397.

EPA's 2004 rule was successful in balancing its obligations under the CAA to protect public health while also only imposing controls that were "necessary." This is evidenced by the fact that the rule was not challenged by the lime industry nor by any environmental groups.

Likewise, in 2020, the Agency issued a final rule to fulfill its obligations under CAA § 112(d)(6) and (f)(2), a.k.a. the "risk and technology review" (RTR). Here EPA found that: "risks are acceptable and that the current NESHAP provides an ample margin of safety to protect public health." *National Emission Standards for Hazardous Air Pollutants: Lime Manufacturing Plants Residual Risk and Technology Review*, 85 Fed. Reg. 44960. EPA further determined that: "There are no developments in practices, processes, or control technologies that necessitate revisions to the standards." *Id.*

EPA takes a completely different approach in the 2023 Proposed Rule. This proposal is being driven not by science or what is necessary to protect public health, but rather by arbitrary deadlines. EPA is rushing through this rulemaking process because of two court decisions that are imposing unnecessary deadlines and substantive requirements that are nowhere found in § 112(d)(6) of the Clean Air Act.<sup>2</sup> Despite the fact that EPA has consistently determined for over two decades that risks from lime plant emissions are acceptable with an ample margin of safety, and thus that additional MACT regulations for the lime industry sector are *unnecessary*, the Agency is rushing to complete this rulemaking as soon as possible because of a court-ordered deadline of February 23, 2023, for the promulgation of a final rule to add four additional MACT emissions standards whether EPA believes it is necessary or not.<sup>3</sup>

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<sup>2</sup> Despite meeting its obligations of CAA § 112(d)(6) and (f)(2) by issuing a final RTR rule in 2020, EPA takes the position that it must issue a new rule following the decision in *Louisiana Environmental Action Network v. EPA*, 955 F.3d 1088 (D.C. Cir. 2020). EPA misinterprets *LEAN* to require a revised standard here despite EPA's RTR findings of no residual risks or available new technologies. Further, even if EPA's interpretation of *LEAN* was correct, NLA asserts that the *LEAN* case was wrongly decided and should be revisited and reversed by the D.C. Circuit or the Supreme Court.

<sup>3</sup> NLA notes that the District of Columbia District Court issued an order on January 24, 2023, extending the deadline for the final rule to August 1, 2023. That new deadline is still woefully inadequate to properly address the significant errors and technical issues with the Proposed Rule, let alone complete the small business analysis and panel process required by the Regulatory Flexibility Act and SBREFA.

This situation has caused the Agency to take numerous inappropriate and unlawful shortcuts in the rulemaking. These include: (1) disregarding the requirements of the Regulatory Flexibility Act by making an improper certification of “no significant impact on a substantial number of small entities” and failing to convene a small business review panel; (2) failing to provide the public with any actual regulatory language to comment on in the *Federal Register* (a preamble, but no rule language was published); (3) reversing several crucial determinations in the 2004 lime rule without mention, comment or explanation as required by CAA § 307(d)(3)(42 U.S.C. § 7607(d)(3)); (4) making significant errors in MACT floor calculations for both HCl and D/F; (5) failing to submit the proposal to the Office of Management and Budget (OMB) for review as required by Executive Orders 12,866 and 13,563 (*Regulatory Planning and Review*, Exec. Order No. 12866, 58 Fed. Reg. 51735 (Sept. 30, 1993); and *Improving Regulation and Regulatory Review*, Exec. Order No. 13563, 76 Fed. Reg. 3821 (Jan. 18, 2011)); (6) using an unlawful and scientifically unsupportable surrogate of THC for oHAP emissions; and (7) using insufficient data to set an emissions standard for D/F, but also proposing two inconsistent standards for D/F—one in the *Federal Register* preamble and a different one in another document in the rulemaking docket without explanation.

EPA must correct these legal errors, repropose the rule after performing proper small business impact review, and provide a meaningful opportunity for the public to comment on this rulemaking. Failure to do so would be arbitrary and capricious, and contrary to the requirements of the Clean Air Act, the Administrative Procedure Act, and the Regulatory Flexibility Act. NLA’s comments will elaborate on each of these issues and others in more detail below.

## **TECHNICAL BACKGROUND**

The Proposed Rule demonstrates a lack of technical understanding of the lime industry in several important respects. Below is a discussion providing technical background on how lime kilns and their HAP emissions interact. Specifically, the discussion below relates to the four new HAP categories addressed in the Proposed Rule: HCl (hydrogen chloride), Hg (mercury), oHAP (organic Hazardous Air Pollutants), and D/F (dioxins and furans).

First, lime kilns differ substantially from traditional fuel combustion sources and kilns from other industrial sectors in how HAPs are emitted and controlled. For example, fossil fuel-fired boilers and heaters and tunnel kilns used to manufacture brick or ceramics exhibit significantly different emissions formation phenomenon and emissions gas stream characteristics from those found in lime kilns, and thus basing assumptions on performance of these devices, as EPA appears to have done, has led to errors in analysis, and the failure to consider important factors that will affect cost and performance of air pollution control devices in lime plants. These non-lime sources do not involve the level of complexity related to the temperatures necessary to achieve calcination in a lime kiln and the long-life requirements of lime plant design and operation near a quarry, and they are not involved in continuously operating processes in a lime plant that have many tons per hour of a circulating product load. These operational realities, formation mechanisms, and exhaust gas stream characteristics are far more complex for a lime kiln than a typical combustion device or tunnel kiln. Comparison with cement kilns can also lead to erroneous conclusions, because cement kilns differ substantially from lime kilns due to the

variety of feedstocks and fuels, and the differences in processes. Below is a brief discussion for each newly regulated HAP.

- HCl. The formation of HCl is incidental to the lime production process and is a function of the temperatures required to make lime, the fuels used for their energy value, and constituents found in the raw material input (limestone) to the kilns. Given that the lime kiln process is alkaline in nature, its environment already offers an inherent reduction of acid gas emissions, including HCl, without any additional controls. The proposed MACT standard starts from a floor that is based on the few lowest emitting sources and then proceeds to require the installation of expensive controls to attempt to reduce very low levels to even lower levels without conclusive data on its feasibility, and with unsupported estimates of its cost.
- Mercury. Emissions of mercury are low from lime kilns. Mercury can be emitted in either its elemental or ionic (oxidized) form at ratios that will require extensive study and design controls for lime kilns subject to the rule. Unlike typical combustion systems, where emitted mercury is solely a function of levels in fuels, a lime kiln also can see contributions to emissions from trace levels of mercury that naturally occur in limestone. The large quarries at lime plants have natural variability in such trace compounds. Given the requirement that large volumes of stone are necessary to make lime and the long-term capital investment needed to build and operate a lime plant, most lime plants are located near their limestone source with decades-long operational and mining plans. NLA has produced and provided to EPA significant volumes of data on mercury, and demonstrated how EPA should apply an intra-quarry variability (IQV) factor to account for variability of mercury in stone feedstocks. However, EPA rejected that data for flawed reasons, even though EPA has provided flexibility for similar industries providing significantly less data than NLA provided.
- Organic HAPs (THC as EPA's proposed surrogate). Emissions of organic HAPs from lime kilns are very low in quantity and in the number of individual HAPs. These organic HAPs can be formed incidentally during combustion in the kiln and can also be formed by miniscule amounts of naturally occurring organics contained in limestones that decompose at lower temperatures and randomly form organic HAPs. To address these very small amounts of organic HAPs, EPA proposes to set a MACT floor for total hydrocarbons (THC) as a surrogate. However, NLA has repeatedly and consistently demonstrated that science does not support THC as a surrogate for oHAPs. NLA has developed a superior aggregated oHAP alternative to THC outlined in the comments below. Use of THC as a surrogate creates numerous technical complications, given that it includes multiple other substances, most of which are not hazardous air pollutants and some of which cannot be effectively reduced with activated carbon injection.
- Dioxins and Furans. Dioxins and furans (D/F) are emitted in extremely low quantities from lime kilns, and in some cases are not detectable at all. Many, if not most, lime kilns affected by this rule may not have detectable levels of D/F and yet

will be subject to burdensome testing in perpetuity. The formation of D/F is incidental by nature in a lime kiln where organics and chlorides are available to form barely detectable levels of D/F (in the parts per billion range) in some kilns. Despite EPA’s own studies and documentation in the prior Lime MACT and RTR rulemakings confirming the extremely low levels of D/F from lime kilns, EPA has proposed the most stringent limit available.

EPA’s faulty assumptions result in an unrealistic and overly optimistic technical and economic supporting rationale for the Proposed Rule.

## GENERAL ISSUES

### I. THE CLEAN AIR ACT DOES NOT REQUIRE EPA TO REGULATE UNREGULATED HAZARDOUS AIR POLLUTANTS IN THIS PROCEEDING

There are two key reasons why EPA should not be engaged in this rulemaking. First, any lawsuits or petitions demanding revisions to the underlying lime MACT standard are time-barred, and thus EPA is under no legal obligation to engage in this rulemaking. Second, even if not time-barred, it is not “necessary” in this residual risk and technology (RTR) proceeding to revise the MACT standard.<sup>4</sup>

#### A. EPA Should Not Have Undertaken to Rewrite the Lime Manufacturing MACT Standard in the First Place Because All Parties Are Time-Barred from Challenging That Standard

EPA is undertaking this revision to the existing lime MACT standard in this RTR proceeding because environmental petitioners requested that it do so following the DC Circuit’s opinion in *Louisiana Environmental Action Network v. EPA*, 955 F.3d 1088 (D.C. Cir. 2020) (“*LEAN*”). However, environmental petitioners are time-barred from challenging the underlying lime MACT standard because they failed to do so within the 60-day time period following promulgation of the original MACT standard in 2004, and thus there is no legal obligation for EPA to undertake this rulemaking.

Section 307(b) of the Clean Air Act requires any party to initiate a challenge for EPA’s failure to set hazardous air pollutant (HAP) standards within 60 days from promulgation of the original MACT standard. 42 U.S.C. § 7601(b)(1). This requirement is jurisdictional, and a court cannot waive or lengthen it. *Med. Waste Inst. & Energy Recovery Council v. EPA*, 645 F.3d 420, 427 (D.C. Cir. 2011); *NRDC v. EPA*, 571 F.3d 1245, 1265 (D.C. Cir. 2009). The *LEAN* court acknowledged the argument, **but did not address it or rule on its merits**. This limitation on judicial review of EPA actions serves an “important reason[]: to enforce repose so that the rulemaking process is not crippled by surprise challenges to matters that were rightfully presumed settled . . . .” *EME Homer City Generation, L.P. v. EPA*, 696 F.3d 7, 38 (D.C. Cir. 2012), *rev’d on other grounds*, 572 U.S. 489 (2014) (Rogers, J., dissenting). Further, this

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<sup>4</sup> The Proposed Rule preamble suggests that the EPA is proceeding under the authority of Clean Air Act section 112(d), but it is clear that this rulemaking is essentially a continuation of EPA’s RTR rulemaking in light of the *LEAN* decision, as explained in the Procedural Background above.

jurisdictional timeline protects the regulated industry by allowing industry to plan for compliance obligations. *Cf. Lead Indus. Ass'n, Inc. v. EPA*, 647 F.2d 1184, 1186 (D.C. Cir. 1980) (observing that the CAA's strict deadlines for completing the steps to promulgate ambient air quality standards, and the limitation on stays pending petitions for reconsideration in CAA section 307(d)(7)(B), are evidence of "a strong congressional desire that the procedure for establishing air quality standards be completed expeditiously and with considerable finality").

Here, the underlying lime MACT standard was promulgated in 2004, 69 Fed. Reg. 394 (Jan. 5, 2004). The challenge to EPA's RTR rule (challenging EPA's decision not to regulate additional HAPs in the original MACT rule) was not filed until September 22, 2020, over 16 years beyond the 60-day judicial review period established by Congress. Accordingly, any challenge to the existing MACT standard would be time-barred, and thus EPA is under no legal obligation to initiate this rulemaking.<sup>5</sup>

Furthermore, the time bar argument is stronger in the context of the lime MACT standard than it was in the *LEAN* case, because all the pollutants addressed in this new rulemaking were explicitly addressed in the original lime MACT rulemaking in 2004. This is not a case in which HAPs were ignored or inadvertently omitted, but rather a case in which EPA specifically decided that regulation was not necessary, a decision that was not challenged at the time.

Thus, for HCl, in the 2004 MACT rule, EPA *explicitly* performed a review under CAA section 112(d)(4). Below is what EPA stated in the final rule preamble:

We are not regulating HCl emissions from lime kilns in the final NESHAP. Under the authority of section 112(d)(4) of the CAA, we have determined that no further control is necessary because HCl is a "health threshold pollutant," and HCl levels emitted from lime kilns are below the threshold value within an ample margin of safety. See generally, 67 FR 78054–057. As explained there, the risk analysis sought to assure that emissions from every source in the category result in exposures less than the threshold level even for an individual exposed at the upper end of the exposure distribution. The upper end of the exposure distribution is calculated using the "high end exposure estimate," defined as a plausible estimate of individual exposure for those persons at the upper end of the exposure distribution, conceptually above the 90th percentile, but not higher than the individual in the population who has the highest exposure. We believe that assuring protection to persons at the upper end of the exposure distribution is consistent with the "ample margin of safety" requirement in section 112(d)(4). In the proposed rule, we published the results of the risk analysis on which we based this decision. More information on the risk analysis may be found in the published proposed rule (67 FR 78054–78057) and in the docket. We received only one comment on our risk analysis.

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<sup>5</sup> To the extent that the *LEAN* court could be deemed to have ruled against the time bar argument, NLA respectfully submits that the case was wrongly decided, for the reasons stated in these comments. The decision was not appealed by any party. NLA was not a party, but rather an *amicus* in that case, and thus was not able to appeal the decision.

69 Fed. Reg. 398.<sup>6</sup> EPA explicitly states that it is making this determination under the authority of section 112(d)(4)—it is not a matter of the Agency simply deciding that it did not need to regulate HCl because of low risk. Because EPA explicitly found in 2004 that HCl was a threshold pollutant, and that the criteria of section 112(d)(4) were satisfied—and no one challenged the rule—any legal challenge to that determination is now time-barred.

EPA also addressed mercury in the 2004 rule preamble, choosing not to issue a mercury standard because: “The only control technique would reflect control of the raw materials and/or fossil fuels. This control is not duplicable or replicable. We also determined that an emissions limit for mercury based on a beyond-the-MACT-floor option is not justified after consideration of the cost, energy, and non-environmental impacts.” 69 Fed. Reg. 398. EPA received no adverse comments on this approach and the final rule was not challenged.

For organics and dioxins/furans, EPA’s technical contractor explained the decision not to issue standards in a memorandum in the docket. For organics, EPA’s contractor stated that there was essentially no data suggesting organics were emitted. The contractor stated that after a review of emissions test data, “[o]nly one test reported any emissions of organic HAPs from lime manufacturing...” Docket No. A-95-41, Item No.II-B-121 at 1. For dioxins and furans, the contractor stated: “Emissions of dioxin and furan congeners are well-documented, but are shown to be emitted in extremely small quantities; therefore, dioxin and furan data were not collected in this search.” *Id.*

Thus, EPA addressed all these HAPs in the 2004 MACT rulemaking, and its determinations were unchallenged until this effort to bootstrap such challenges into the RTR rulemaking. EPA should rely on its prior reasonable decisions, and should reject any effort to bring challenges that are legally time-barred.

**B. EPA Should Not Revise the MACT Standard for Lime Manufacturing Because it is Not “Necessary” to Do So, Given EPA’s RTR Findings of No Residual Risks or Available New Technologies**

The *LEAN* court held that “...because the Act necessitates section 112 compliant emission standards for each source category, and section 112(d)(6) requires EPA at least every eight years to review and revise emissions standards ‘as necessary,’ EPA’s section 112(d)(6) review of a source category’s emission standard must address all listed air toxics and source category emits.” *LEAN*, 955 F.3d at 1091. Under that decision, EPA must “address” whether any further regulation of listed air toxics is “necessary,” in its discretion. For lime manufacturing, EPA already “addressed” this in 2004, and found, in promulgating the lime RTR standard, that there were no residual risks and no technological advances of note, and therefore no reason to revise the MACT standard for the source category. 85 Fed. Reg. at 44965-66. Hence, EPA in its

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<sup>6</sup> See docket items EPA-HQ-OAR-2002-0052-0767 and EPA-HQ-OAR-2002-0052-0768 for more information on the extensive risk assessment performed for HCl in the original lime MACT rule. NLA incorporates those documents into these comments by reference.



discretion may, and in our opinion, must reasonably conclude that it is not “necessary” to revise the MACT standard any further, consistent with *LEAN*.<sup>7</sup>

Put another way, and to echo arguments made by the NLA in its post-*LEAN* comments,<sup>8</sup> EPA has substantial discretion to consider all relevant factors to determine whether standards for unregulated HAPs are “necessary” in an RTR rulemaking, including but not limited to: what proportion of the affected sources are actually known to emit the HAP; how close to a detection limit the concentrations are; whether the concentrations are likely to be reduced significantly by imposing an additional technology-based limitation; whether the technology that is in effect for HAPs already regulated will also control the “missing HAP”; and how cost effective additional controls would be (since section 112(d)(6) allows costs to be taken into account).

The costs of this rule are significant and were both understated and disregarded by the Agency. NLA’s consultant calculates that the rule will require real total capital investments in pollution control equipment of \$920 million. In addition, the rule will impose total annual costs of up to \$180 million.<sup>9</sup> These annual costs are almost 600% higher than EPA’s estimate of a \$32 million total annual cost to the lime industry. When imposing regulatory requirements that are unquestionably unnecessary for reducing risk with an ample margin of safety, EPA should take these exorbitant costs into account. The Agency should either forego regulations or, at a minimum, use every available option in its discretion to reduce the costs on lime manufacturers.

The benefits of the rule are minimal, and even those are overstated by the Agency. The Agency says that: “For HCl, mercury, and THC, installation of controls will result in a combined reduction of total HAP of 1,730 tons per year (tpy).” 88 Fed. Reg. 816. THC reductions are cited as the second highest benefit of the rule, amounting to a total reduction of 570 tons per year. But THC is not a HAP as listed by Congress in § 112(b)(1)—it is a surrogate that EPA intends to use for organic HAPs that are listed. If EPA is claiming benefits of reducing HAPs, it is misleading to quantify THC reductions as “reduction of total HAP” without clarifying that actual organic HAP emission reductions from this rule would be a fraction of that amount.

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<sup>7</sup> Notwithstanding *LEAN*, the plain language of section 112(d)(6) requires only technology review. Therefore, section 112(d)(6) cannot be used to “fix” unregulated HAPs from a MACT standard – other provisions of the statute (sections 112(d)(2) and (3)) fulfill that purpose. Section 112(d)(6) is meant to be a review only of any technological advances in the eight years after promulgation of a MACT standard, and nothing more. Courts have agreed with this reading of the Clean Air Act and have found that the focus of the section 112(d)(6) periodic review is on new developments in pollution control or prevention technologies since the prior promulgation. *See, e.g., Nat’l Ass’n for Surface Finishing v. EPA*, 795 F.3d 1, 5 (D.C. Cir. 2015) (holding that section 112(d)(6) provides for a “recurring technology review” to determine “whether standards should be tightened in view of developments in technologies and practices since the standard’s promulgation or last revision, and, in particular, the cost and feasibility of developments and corresponding emissions savings”); *Blue Ridge Env’tl. Def. League v. Pruitt*, 261 F. Supp.3d 53, 56 (D.D.C. 2017) (“Specifically, the Amendments required the EPA to promulgate emission standards for each source category, and to revise these standards every eight years in light of improvements in pollution control technology. *See* 42 U.S.C. § 7412(d)(6).”). The approach to HAP regulation that Congress established does not provide for a constant ratcheting-down of MACT standards via section 112(d)(6). *See Surface Finishing*, 795 F.3d at 8-9; *Ass’n of Battery Recyclers v. EPA*, 716 F.3d 667, 673-74 (D.C. Cir. 2013).

<sup>8</sup> *See* Comments from National Lime Association on National Emission Standards for Hazardous Air Pollutants: Lime Manufacturing Plants Residual Risk and Technology Review, EPA Docket No. EPA-HQ-OAR-2017-0015-0039 at 15 (Oct. 31, 2019).

<sup>9</sup> *See* Trinity Cost Analysis, Appendix B.

In addition, the vast majority of HAP emission reductions claimed by the Agency come from HCl controls amounting to reductions of 1,163 tons per year. But the Agency has already determined that even with no HCl controls: “The results of the exposure assessment showed that exposure levels to baseline HCl emissions from lime production facilities are well below the health threshold value \*\*\* Furthermore, no significant or widespread adverse environmental effects from HCl is anticipated.” 67 Fed. Reg. 78,057 (December 10, 2002). That is why the Agency found, twice, that risks from lime manufacturing emissions are “acceptable with an ample margin of safety,” and thus additional controls would not yield significant benefits.

Moreover, *LEAN* did not overrule the seminal D.C. Circuit decision of *Alabama Power v. Costle*, 636 F.2d 323, 360 (D.C. Cir. 1979), which held, in the context of the Clean Air Act’s PSD regulations, that every rule inherently contains a *de minimis* criterion. So, if regulation of unregulated HAPs in this potential revised lime RTR proceeding would only have *de minimis* environmental benefits given the lack of residual risk or technology improvements, it is not necessary for EPA to impose additional controls as it “addresses” such HAPs. Although EPA has taken the position that section 112(d)(6) does not allow for a *de minimis* exception<sup>10</sup>, the U.S. Supreme Court has held that the *de minimis* doctrine is a legal principle that forms part of the established background against which **all statutes** are enacted. *Wisc. Dep’t of Rev. v. William Wrigley, Jr., Co.*, 505 U.S. 214, 231 (1992), and this has been subsequently reiterated by the D.C. Circuit. *New York v. EPA*, 443 F.3d 880, 888 (D.C. Cir. 2006) (“*de minimis* requirements serve to alleviate severe administrative and economic burdens by lifting requirements on ‘minuscule’ emission increases”) (internal quotations omitted).

Another reason that it was not “necessary” for EPA to set standards for additional HAPs through the RTR process here was because, as noted above, all the relevant HAPs were addressed in the 2004 MACT rulemaking, and EPA expressed clear reasons for its decision not to set standards for them, reasons that went unchallenged. In this case, it is not necessary to “fix” any problem with the original MACT rule, because there is no such problem. This is further confirmed by the conclusion of EPA’s risk assessment, which addressed all these HAPs and found no need to impose additional standards on any of them.

Congress amended the Clean Air Act in 1990 by adding sections 112(d)(2) and (d)(3) which require EPA to establish MACT floor standards for existing sources based on the average of the best performing 12% of each industry sector. Congress made this determination because it believed that the Agency was too slow in assessing risks and adopting air emission standards and it wanted to ensure that risks from such emissions were acceptable with an ample margin of safety. But unlike the situation where risks from industry emissions are unknown, in this case there are two risk assessments and Agency findings that emissions from the lime industry are acceptable with an ample margin of safety. Under such circumstances, it is not only “unnecessary” for EPA to issue MACT floor standards, but irrational and contrary to the intent of the Act. Issuing standards that the Agency knows to be unnecessary to protect the public health and the environment is arbitrary and capricious and cannot be consistent with what Congress intended in the Clean Air Act.

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<sup>10</sup> See e.g., EPA Response to Comments for Portland Cement Industry NESHP, 64 Fed. Reg. 31898, 31911 (June 14, 1999).

Congress clearly expressed its view in Clean Air Act § 112(f)(2) that additional regulation in the absence of risk is unnecessary. That section addresses the situation where risks are known (as in this rulemaking) following an appropriate scientific risk assessment by EPA. It instructs the Agency to promulgate additional standards only if required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect:

\*\*\* the Administrator shall, within 8 years after promulgation of standards for each category or subcategory of sources pursuant to subsection (d), promulgate standards for such category or subcategory if promulgation of such standards is required in order to provide an ample margin of safety to protect public health in accordance with this section \*\*\* or to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect.

42 U.S.C. § 7412(f)(2).

Yet EPA found as recently as 2020 that risks from emissions of the lime manufacturing industry are acceptable with an ample margin of safety:

In this action, we are finalizing our proposed determination that risks from the source category are acceptable, the standards provide an ample margin of safety to protect public health, and more stringent standards are not necessary to prevent an adverse environmental effect.

85 Fed. Reg. 44,963 (July 24, 2020).

Accordingly, since EPA's own scientific findings demonstrate that promulgating new standards is not "required" to provide an ample margin of safety to protect public health, there is no statutory basis for EPA to revise the lime manufacturing sector's MACT standards by adding these four additional HAPs.

It should also be noted that no lime plants currently use any add-on control technology to control emissions of any of the four HAPs involved in this rulemaking. Differences in emissions are thus not the result of controls, but rather result from differences in feedstocks (stone and fuel), and operation of lime plant equipment. NLA believes that it is anomalous, and contrary to what was intended when the Clean Air Act air toxics provisions were written, to suggest that a source with lower concentrations of a HAP in stone in its quarry (for example) is somehow the "best performer" in terms of controlling emissions of that HAP. Thus, NLA believes that it is improper to set a MACT floor based on such emissions data. NLA is aware that EPA takes a contrary view, but the facts of this case—in which stringent standards are being imposed even with a finding of acceptable risk with an ample margin of safety for HAPs that are not being controlled by any source—justify a reconsideration of EPA's position. Instead of setting MACT floors, EPA should have (at most) approached all four HAPs with a beyond-the-floor approach,

which would have permitted the Agency to consider costs and risks, resulting in more reasonable standards (or no standards at all).<sup>11</sup>

Finally, the *LEAN* decision must be read in the context of the Supreme Court's recent opinion in *West Virginia v EPA*, which was decided post-*LEAN*. In that case, the Supreme Court held that for "major questions" – like the scope of EPA's authority to issue greenhouse gas regulations for existing power plants under section 111(d) of the Clean Air Act – EPA must demonstrate that Congress gave it specific authority for its regulatory action. *West Virginia v. EPA*, 142 S. Ct. 2587 (2022). Surely, the question of whether EPA can reach back decades in an RTR proceeding (under sections 112(f) and 112(d)(6)) and find that a provision of the Clean Air Act that was designed to require review for technological advances somehow compels EPA to reopen a MACT standard (issued under sections 112(d)(2) and (3)) is a major one. Congress did not give EPA that authority. Accordingly, EPA's Proposed Rule is unlawful.

## **II. EPA'S PROPOSED RULE VIOLATES CLEAN AIR ACT SECTION 307**

### **A. EPA Violated the Clean Air Act by Not Publishing the Proposed Rule Language in the *Federal Register***

EPA proposed this rule without publishing any proposed rule language in the *Federal Register*. Rather than setting forth proposed language, EPA instead included a redline version of the current regulations in the docket, presumably to show commenters what the proposed revisions would be. This docket entry is not a lawful substitute for publishing actual rule language – it is a rule that the lime industry must comply with, not the preamble, and not a document tucked away in the record for the rulemaking. Failing to publish such language means that commenters do not have a meaningful opportunity to submit comments on the Proposed Rule. Failure to publish the rule language in the *Federal Register* also violates section 307(d)(3) of the Clean Air Act which requires:

...any rule to which this subsection applies, notice of proposed rulemaking shall be published in the Federal Register...

42 U.S.C. § 7607(d)(3).

EPA should properly publish proposed rule language in the *Federal Register* and repropose the rule.

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<sup>11</sup> As noted above, EPA explicitly recognized this point with respect to mercury in the original MACT rule: "The only control technique would reflect control of the raw materials and/or fossil fuels. This control is not duplicable or replicable. We also determined that an emissions limit for mercury based on a beyond-the-MACT-floor option is not justified after consideration of the cost, energy, and non-environmental impacts." 69 Fed. Reg. 398.

**B. EPA Violated the Statement of Basis and Purpose Requirement by Failing to Include a Summary of the Major Legal Interpretations and Policy Considerations Underlying the Proposed Rule**

The Proposed Rule reverses important determinations made in the original lime MACT standard issued in 2004 without mention, comment or explanation by the Agency. For example, the Proposed Rule does not contain a section 112(d)(4) health-based standard for hydrochloric acid (HCl). This is a reversal of EPA’s longstanding position in the 2004 MACT standard and was not even mentioned in the 2023 Proposed Rule.<sup>12</sup> Additionally, EPA proposes a beyond-the-floor standard for mercury, again reversing its position in the original MACT standard without comment or explanation in the new proposal.<sup>13</sup>

In the preamble of the 2023 Proposed Rule, EPA states that: “In response to the 2017 questionnaire, we received HCL emissions data that EPA did not have when we developed the 2004 NESHAP. Therefore, we are proposing a standard pursuant to CAA section 112(d)(2) and (d)(3), as described further in section IV.A.1 of this preamble.” 88 Fed. Reg. 809. While these two sentences are each factually true, taken together without explanation, they are misleading. That is because they imply cause and effect—i.e. that the reason the Agency is now promulgating MACT floor standards for HCl is because it obtained new emissions information that justified such regulation that was not available in 2004. This is simply not the case. EPA had ample HCl information for its initial MACT rulemaking when it determined that:

The results of the exposure assessment showed that exposure levels to baseline HCl emissions from lime production facilities are well below the health threshold value. Additionally, the threshold values, for which the RfC and AEGL values were determined to be appropriate values, were not exceeded when considering conservative estimates of exposure resulting from lime kiln emissions as well as considering background exposures to HCl and therefore, represent an ample margin of safety. Furthermore, no significant or widespread adverse environmental effects from HCl is anticipated. Therefore, under authority of section 112(d)(4), we have determined that further control of HCl emissions from lime manufacturing plants is not necessary.

67 Fed. Reg. 78,057 (December 10, 2002).

EPA has not identified any new data from the 2017 ICR that is so fundamentally different that it justifies regulation of HCl from lime manufacturing plants. Quite the contrary, the Agency affirmed the acceptability of risks from all HAPs, including HCl, as recently as 2020. 85 Fed. Reg. 44,960 (July 24, 2020) (“We are finalizing our proposed determination that the risks are acceptable and that the current NESHAP [which excludes HCl controls] provides an ample margin of safety.”) (parenthetical added). All the data from the 2017 questionnaire on HCl was available to EPA when it performed the risk assessment that the Agency used as the basis for its

<sup>12</sup> See 69 Fed. Reg. at 398 (EPA states that “under the authority of section 112(d)(4) of the CAA, we have determined that no further control is necessary because HCl is a “health threshold pollutant”).

<sup>13</sup> *Id.* (In 2004, EPA stated that: “[A]n emissions limit for mercury based on a beyond-the-MACT-floor option is not justified after consideration of the cost, energy, and non-environmental impacts”).

2020 determination that risks are acceptable and that the existing regulations provide an ample margin of safety.

EPA must repropose the rule to provide an explanation of its position, including the reversals and errors, on the four HAPs (HCl, mercury, organics and D/F) at issue. *See Motor Vehicle Mfrs. Assn. v. State Farm*, 463 U.S. 29, 49 (1983) (“We have frequently reiterated that an agency must cogently explain why it has exercised its discretion in a given manner”) (“...an agency changing its course by rescinding a rule is obligated to supply a reasoned analysis for the change beyond that which may be required when an agency does not act in the first instance.”) *Id.* at 42. The failure of EPA to explain its reasoning for abandoning its previous legal and policy interpretations related to these four HAPs is a clear violation of the Clean Air Act, which states that the Agency’s rulemaking “shall be accompanied by a statement of basis and purpose...[which] shall include...the major legal interpretations and policy considerations underlying the proposed rule.” CAA § 307(d)(3), 42 U.S.C. §7607(d)(3).

### C. EPA Failed to Provide a Reasonable Period for Public Participation

The Clean Air Act requires EPA to provide a reasonable period for public participation in responding to a proposed rule:

It is the intent of Congress that, consistent with the policy of subchapter II of chapter 5 of title 5, the Administrator in promulgating any regulation under this chapter, including a regulation subject to a deadline, shall ensure a reasonable period for public participation of at least 30 days\*\*\*

CAA §307(h), 42 U.S.C. § 7607(h).

In the case at hand, EPA provided a comment period of 45 days. While this is more than the 30-day statutory minimum, it does not provide a “reasonable period” for response under the circumstances of this rule. Note, as stated above, that EPA provided 60 days for comment in the original MACT rule, which came after an almost yearlong full SBREFA panel and review of a draft version of the rule—and involved emission standards only for particulate matter, as opposed to standards for four additional HAPs in the current rule.

NLA and several of its members requested an extension to the comment period, citing the numerous technical challenges in preparing a timely response in only 45 days. (*See, e.g.*, docket items EPA-HQ-OAR-2017-0014-0141, 0142, 0143, 0145, 0146, 0147, 0149 and 0150.) EPA rejected these requests, in violation of its obligations under Executive Order 13563, which requires EPA to “afford the public a meaningful opportunity to comment” on proposed rules, “with a comment period that should generally be at least 60 days.” 76 Fed. Reg. 3821 (Jan. 21, 2011). Providing a reasonable period is particularly important here, where EPA: did not propose any actual rule language in the *Federal Register*; suggested different emissions standards for dioxins and furans in the Proposed Rule preamble and the redline document; published incorrect MACT floor calculations; and improperly certified that there would be no significant small business impacts.

**D. EPA Failed to Submit the Proposed Rule to the Office of Management and Budget (OMB) for Review as a Significant Regulatory Action—the Opposite of What It Did in 2002**

In 2002 EPA submitted its proposed rule to OMB for review under Executive Order 12,866. 69 Fed. Reg. at 410-411 (OMB notified EPA at proposal that it considered that rulemaking a “significant regulatory action” within the meaning of the Executive Order). However, EPA declared the current proposal non-significant, and OMB was not provided an opportunity to review the rule. Given that the new rule imposes more standards, requires new pollution control equipment, and will impose costs well over \$100 million annually on the lime industry<sup>14</sup>, EPA must submit the 2023 Proposed Rule to OMB for review.

**E. EPA Erred by Publishing Two Different Standards for Dioxins and Furans**

EPA proposes two different standards for dioxins/furans (“D/F”) in the preamble to the Proposed Rule published in the Federal Register, and in supporting documentation. EPA’s standard for D/F in the rule preamble is substantially different from the standard set forth in the redline text of the proposed regulatory language – 0.028 ng/dscm vs. 0.092 ng/dscm. It is not clear which standard EPA is proposing—compounding the issue of EPA’s failure to publish proposed regulatory language in the *Federal Register*. Among other things, this discrepancy has required NLA to do additional work to analyze the potential impacts of each alternative, to meaningfully provide EPA with input about the costs and benefits associated with each standard.

Further, given EPA’s contractor’s previous determination in 2002 that a numeric standard for D/F was not necessary (as well as the Agency’s statements to NLA that it was planning to propose a work practice for D/F and not a numeric standard), additional time was needed to adequately address these proposals.<sup>15</sup> EPA’s failure to correct and repropose the rule with the correct standard has compromised the NLA’s ability to properly analyze the costs, benefits, and implications associated with the D/F standard, and has deprived NLA and its members of a meaningful opportunity to comment on the proposal.

**III. EPA VIOLATED THE REGULATORY FLEXIBILITY ACT (AS AMENDED BY SBREFA) BY ERRONEOUSLY CERTIFYING THAT THE RULE WILL NOT HAVE A SIGNIFICANT ECONOMIC IMPACT ON A SUBSTANTIAL NUMBER OF SMALL ENTITIES**

Before EPA had even proposed the original MACT rules in 2002, the Agency spent almost a year analyzing the potential impacts on small businesses in the lime industry. EPA hosted meetings between small businesses, the Small Business Administration (SBA), and EPA staff in a small business review panel and performed a legitimate initial regulatory flexibility analysis (IRFA). EPA mentioned “small business” 20 times in the preamble to the 2004 final rule. These actions resulted in significant improvements to EPA’s draft rule and significantly

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<sup>14</sup> See Trinity Cost Calculation, Appendix B.

<sup>15</sup> See EPA Docket No. A-95-41, Item No. II-B-121. (“Emissions of dioxin and furan congeners are well-documented, but are shown to be emitted in extremely small quantities; therefore, dioxin and furan data were not collected in this search.”)

reduced the cost of compliance for small businesses in the lime industry. 67 Fed. Reg. 78,046, 78,066 (Dec. 20, 2002). The Agency took pride in its efforts to work with small businesses and concluded that: “The EPA’s efforts to minimize small business impacts have materially improved today’s final rule..69 Fed. Reg. 412 (January 5, 2004).

Unlike the original MACT proposed rule, EPA’s 2023 Proposed Rule improperly assumes that there will be no “significant economic impact” on a substantial number of small entities. Almost as an afterthought, the words “small business” appear only four times in the preamble to this rule. EPA’s assumption of no significant impact is apparently based on its very limited economic impact screening analysis, which says that: “the costs associated with the proposed requirements for these entities are less than 1 percent of annual sales for each affected small entity. Therefore, it is not anticipated that there will be a significant economic impact on a substantial number of small entities (SISNOSE) from these amendments.”<sup>16</sup>

EPA’s certification of no significant impact in the new rule is erroneous, because the Proposed Rule is significantly more onerous than the one in 2004, imposes controls on four times as many pollutants with significantly lower standards that will be harder to meet,<sup>17</sup> and will require small entities to install at least two new types of pollution control mechanisms at their lime operations. NLA and its consultant previously submitted documentation of substantial expected costs from potential standards. *See* EPA-HQ-OAR-2017-0015-0091 and attachments.

Additional documents submitted in conjunction with these comments further demonstrate exactly how and why EPA’s proposed emissions standards will have a significant economic impact on a substantial number of small entities if finalized. Appendix A, prepared with the assistance of NLA’s consultant Trinity, details numerous respects in which EPA underestimated the total costs of the Proposed Rule, and in particular instances in which EPA miscalculated the costs and difficulties of achieving its projected removal efficiencies of identified pollution control devices. Trinity has prepared an update of its cost analysis<sup>18</sup> which indicates that EPA’s proxies for technology transfer are flawed and dramatically underestimate the economic impacts to the industry. Oversimplified assumptions on the effectiveness of candidate control technologies and comparison to a prior Agency analysis for a similar process industry both indicate that EPA’s economic analysis is an order of magnitude too low.

Small businesses in the lime industry have carefully analyzed the impacts of EPA’s Proposed Rule and determined that the Agency’s cost estimates are significantly understated and therefore the rule will have a significant economic impact on a substantial number of small entities. For example, one of the small companies impacted by the proposal, Greer, stated that:

EPA conducted a perfunctory economic impact and small business screening assessment for the Proposal and erroneously certified that the Proposal would not have a significant economic impact on a substantial number of small businesses. Had it conducted a meaningful and proper small business economic analysis, EPA would have recognized

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<sup>16</sup> *See Economic Impact and Small Business Screening Assessments for Proposed Amendments to the National Emission Standards for Hazardous Air Pollutants for Lime Manufacturing Facilities*, November 3, 2022, at p. 7.

<sup>17</sup> *See* Appendix A for details on challenges in applying the treatment technologies identified by EPA.

<sup>18</sup> *See* Appendix B.



the significant economic impacts its Proposal will have on Greer Lime and other small lime manufacturers. \*\*\*

Greer also stated that:

\*\*\* realistic cost data and information obtained by Greer Lime demonstrates that EPA significantly undervalued the estimated costs to comply with the Proposal and failed to comply with the requirements of the Small Business Regulatory Enforcement Fairness Act (SBREFA) prior to issuing the Proposal. \*\*\*

Greer Letter (February 21, 2023) at pp. 1-2, Appendix C.

Similarly, another affected small lime producer, Pete Lien and Sons, identified numerous issues with the Proposed Rule. Some of these include the following:

- EPA substantially underestimates the costs of controls needed for complying with the current proposal for the lime industry in general and in particular, for the smaller businesses;
- The cost associated with retrofitting these substantially large and complex control systems into existing operating facilities was grossly underestimated; and
- EPA's costs are grossly underestimated compared to actual costs estimates obtained by [Pete Lien & Sons].

Pete Lien & Sons Letter (Feb. 8, 2023) at pp. 2-3, Appendix D.

Pete Lien provided detailed projected estimated costs obtained for each of its preheater rotary kilns (quicklime) in operation at Rapid City, South Dakota (2 Kilns) and Laramie, Wyoming (1 Kiln). Capital equipment costs were converted to installed and annualized operating costs using the same methodology and factors used by EPA. The analysis demonstrates that the cost of compliance would be significant.

The Office of Advocacy is an independent office within the U.S. Small Business Administration (SBA). Congress established the Office of Advocacy under Pub. L. 94-305 to represent the views of small entities before Federal agencies and Congress. After hearing input from NLA's small business members who would be adversely impacted by the rule and reviewing EPA's proposed rulemaking, the Office of Advocacy filed comments concluding that:

This proposed rule is likely to impose significant economic costs on all three of the small businesses affected. EPA's certification of the rule under section 605(b) of the RFA lacks a factual basis, and, therefore, EPA must convene a SBREFA panel and prepare an IRFA. Because this proposed rule would impose significant costs without an appreciable public health benefit according to EPA's analysis, EPA should be adopting the maximum flexibilities allowed under the Clean Air Act to minimize the burden, including a health-

based standard for HCl, considerations for mercury variability within limestone deposits, and work practice standards for D/F.

Office of Advocacy Letter to EPA at p. 8 (February 16, 2023).<sup>19</sup>

Accordingly, EPA must resume its small business analysis by completing an IRFA and convening a small business review panel to develop reasonable regulatory alternatives for consideration that will accomplish EPA's objectives under the Clean Air Act that are less burdensome to small businesses. Such actions by EPA are not discretionary but rather are required by the RFA as amended by SBREFA.<sup>20</sup> It should also be noted that these actions must be taken in conjunction with the publication of the Proposed Rule.<sup>21</sup> Therefore, EPA must repropose the rule for public comment after doing a proper IRFA and receiving input from the small business panel process.

Instead of erroneously certifying the rule as having no impact, EPA should have: (1) conducted an IRFA as required under the Regulatory Flexibility Act to determine the actual costs on small entities; and (2) convened a small business review panel to discuss the rule with the SBA and small lime companies to determine whether there are reasonable alternatives to the Agency's standards that would have less economic impact on small businesses. *See* 5 U.S.C. §§ 601-612. EPA should withdraw the rule to allow adequate time for such small business consultation as they did over two decades ago. EPA's failure to abide by the requirements of the Regulatory Flexibility Act is subject to judicial review under the Small Business Regulatory Enforcement Fairness Act 5 U.S.C. § 609. *See* 5 U.S.C. § 611(a)(1) ("For any rule subject to this chapter, a small entity that is adversely affected or aggrieved by final agency action is entitled to judicial review of agency compliance with the requirements of sections 601, 604, 605(b), 608(b), and 610 in accordance with chapter 7.").

#### **IV. EPA SHOULD AUTHORIZE PLANT-WIDE WEIGHTED EMISSIONS AVERAGING FOR ALL HAPS COVERED BY THE RULE**

If, despite the comments above, EPA proceeds with this rulemaking, the Agency should make changes to the proposed provisions, as set out in the remainder of the comments below.

NLA requests that emissions averaging, similar in concept to the existing emissions averaging requirements contained for PM in the current Lime MACT rule, be incorporated into a final rule for the newly regulated HAPs. This will allow lime plants to more cost-effectively optimize controls to prevent excessive emissions across the entire facility.

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<sup>19</sup> *See* Appendix E (SBA Office of Advocacy Letter to EPA (Feb. 16, 2023)).

<sup>20</sup> *See* 5 U.S.C. § 603 (requiring an initial regulatory flexibility analysis whenever an agency is required by section 553 of this title, or any other law, to publish general notice of proposed rulemaking for any proposed rule; *see also* 5 U.S.C. § 609(b) & (d) (requiring small business review panels for "covered agencies," which expressly includes EPA).

<sup>21</sup> 5 U.S.C. § 603(a) (The initial regulatory flexibility analysis or a summary shall be published in the *Federal Register* at the time of the publication of general notice of proposed rulemaking for the rule). This means that EPA may not perform the required regulatory flexibility analysis for this rule without first withdrawing the Proposed Rule.

In the 2004 Lime MACT, EPA permitted plant-wide averaging of PM emissions (with some limitations), explaining:

We believe that allowing averaging is appropriate here because of the identity of the units (kilns and coolers in all cases), and the emissions (same HAP in same type of emissions, since all emissions result from kilns and coolers). Averaged emissions under these circumstances would, thus, still reflect MACT for the affected source. The averaging provisions are included in the final NESHAP as a result of the recommendations of the Small Business Advocacy Panel convened as required by section 609(b) of the Regulatory Flexibility Act (RFA) and improves the compliance flexibility options for small businesses, which is the intent of the RFA.

69 Fed. Reg. 401 (Jan. 5, 2004). For similar reasons, EPA should allow averaging for the additional HAPs added in this rule.

NLA suggests that for limitations based on pounds or tons of HAP per ton or MMton of lime produced, and for lime kilns seeking to comply with the same numerical standard, EPA should authorize the weighted average methodology currently available for PM in the current Lime MACT (40 C.F.R. § 63.7111) to show compliance. For concentration-based standards, and again for lime kilns seeking to comply with the same numerical standard, a simple average of results should be allowed for compliance demonstration. For both types of standards, parametric monitoring requirements, as applicable for each kiln in the average, should be set at the injection rate associated with the tests used in the emissions averaging compliance demonstration, with adjustments as discussed later in these comments.

## **V. EPA CORRECTLY PROPOSED TO SET MONITORING REQUIREMENTS AS FIVE-YEAR STACK TESTING AND PARAMETRIC MONITORING**

NLA strongly supports EPA's proposal to establish 5-year stack testing and parametric monitoring as the monitoring requirements for emissions standards under the Proposed Rule.<sup>22</sup> This is consistent with the existing requirements for PM for the lime industry, and, as EPA notes, the parametric monitoring will ensure continuous compliance. Imposing more rigorous and costly monitoring requirements would not be justified in this case, given the low emissions of HAPs generally, and EPA's risk assessment showing that risks are acceptable with an ample margin of safety even without additional controls.

## **VI. EPA CORRECTLY PROPOSED A 3-YEAR COMPLIANCE PERIOD, BUT THE REGULATORY LANGUAGE REQUIRES CORRECTION AND CLARIFICATION**

### **A. A Three-Year Compliance Period Is Necessary**

Given the extensive requirements for study, design, permitting and construction that lime plants would be subject to under the Proposed Rule, the need for a 3-year compliance period is fully justified to adequately test, engineer, design, and retrofit lime plant systems, and then

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<sup>22</sup> NLA suggests some adjustments to the parametric monitoring requirements later in these comments.

demonstrate compliance with the applicable standards. Any time period less than 3 years would jeopardize the industry's ability to comply with the proposed standard.

## **B. The Rule Language on Compliance Period Should Be Corrected**

While EPA's preamble clearly states that a 3-year compliance period is intended for existing sources, language in paragraph 63.7082(f)(1) in the redline rule language in the docket seems to indicate that the compliance period is only 180 days. The preamble states:

The EPA projects that many existing sources would need to install add-on controls to comply with the proposed limits. These sources would require time to construct, conduct performance testing, and implement monitoring to comply with the revised provisions. Therefore, we are proposing to allow 3 years for existing sources to become compliant with the new emission standards. ...

For all affected sources that commence construction or reconstruction on or before January 5, 2023, we are proposing that it is necessary to provide 3 years after the effective date of the final rule (or upon startup, whichever is later) for owners and operators to comply with the provisions of this action. For all affected sources that commenced construction or reconstruction after January 5, 2023, we are proposing that owners and operators comply with the provisions by the effective date of the final rule (or upon startup, whichever is later).

88 Fed. Reg. 815-16. NLA understands "affected sources that commence construction on or before January 5, 2023" to mean "existing sources" with respect to the new standards proposed in this rule, and that these sources are intended to have three years from the date of the final rule to come into compliance.

However, the redline proposed regulatory language in the docket is inconsistent with the preamble language and refers to 180 days rather than 3 years. *See* 67.7083(f)(1) (stating that the relevant compliance timeline is 180 days); *see also* 88 Fed. Reg. 815-16 (indicating that sources have three years from the date of the final rule to come into compliance). There is also a discrepancy between the preamble and the redline rule language on whether the relevant "on or before date" is Jan. 5, 2023, or the date of the final rule. NLA believes that EPA should refer to the final rule date, rather than the Proposed Rule date, because EPA has not proposed regulatory language and therefore sources that commence construction after the Proposed Rule date, but before the final rule date, do not have full notice of the contents of the final rule.

New section 67.7083(f)(1) in the EPA redline document reads:

If your affected source commenced construction or reconstruction on or before [INSERT DATE OF FINAL RULE PUBLICATION IN THE FEDERAL REGISTER], then the compliance date for the revised requirements promulgated on [INSERT DATE OF FINAL RULE PUBLICATION IN THE FEDERAL REGISTER] is [INSERT 180 DAYS AFTER THE DATE OF FINAL RULE PUBLICATION IN THE FEDERAL REGISTER].

This language should be revised to delete the words [INSERT 180 DAYS AFTER THE DATE OF FINAL RULE PUBLICATION IN THE FEDERAL REGISTER] and insert [INSERT 3 YEARS AFTER THE DATE OF FINAL RULE PUBLICATION IN THE FEDERAL REGISTER] to make clear that existing kilns must comply within 3 years of the date of the final rule.

**C. EPA Should Clarify the Use of “New” and “Existing” Kilns**

EPA should also clarify its use of “new” and “existing” kilns in the Proposed Rule. The current NESHAP rule defines a new lime kiln (and its associated cooler), as one for which construction or reconstruction began after December 20, 2002. It also defines an existing lime kiln (and its associated cooler), as one that does not meet the definition of a new kiln.

In proposing emission standards for HCl, THC, Hg, and D/F, EPA uses the terms new and existing in Table 1. However, these standards for “new” and “existing” kilns do not seem to be consistent with the definitions in the current rule. It is assumed that the date of construction or reconstruction as defined by proposed conditions 63.7083(f)(1) and 63.7083(f)(2) are meant to establish existing and new source limits, respectively for HCl, THC, Hg, and D/F. A kiln that was constructed or reconstructed between December 20, 2002, and the date of final rule publication in the *Federal Register* of this (2023) rule should be considered a new kiln for PM and an existing kiln for HCl, THC, Hg, and D/F.

**ISSUES RELATING TO SPECIFIC STANDARDS**

**HCL**

**VII. EPA SHOULD REGULATE HCL BY MEANS OF A HEALTH-BASED STANDARD IN THIS RULEMAKING UNDER CLEAN AIR ACT SECTION 112(D)(4)**

As noted above, EPA determined that HCl was a threshold pollutant when it issued the MACT standard for lime manufacturing in 2004. EPA cannot change that conclusion here unless it provides a factual and legal justification for doing so. EPA has provided no such justification, and none exists. Moreover, EPA has confirmed that HCl is not a carcinogen in several recent RTR rulemakings (see examples below). Finally, there is nothing in the brick/clay MACT *Sierra Club* case that compels a decision to the contrary because the facts here are fundamentally different from the facts in that case. *See, Sierra Club v. EPA*, 895 F.3d 1 (D.C. Cir. 2018).

**A. EPA Carefully Evaluated the Scientific Data and Concluded that HCl Was a Threshold Pollutant in the Original Lime MACT Standard in 2004 and That Finding Was, and Is, Correct**

The Clean Air Act allows EPA to use a health threshold when issuing emission standards under section 112(d) for pollutants for which a health threshold has been established. CAA § 112(d)(4); 42 U.S.C. § 7412(d)(4). Such a health-based standard must include an “ample margin

of safety.” *Id.* In its 112(d) MACT standard for lime manufacturing, EPA concluded that HCl was a threshold pollutant, considering several factors such as “evidence and classification of carcinogenic risk and evidence of non-carcinogenic effects.” 67 Fed. Reg. at 78054-55.<sup>23</sup>

NLA conducted a risk assessment to determine whether emissions of HCl from lime kilns at baseline levels resulted in exposures below threshold values for HCl. EPA reviewed NLA’s risk assessment report and concluded that it used reasonable and conservative methodology, was consistent with EPA methodology and practice, and reached a reasonable conclusion that current levels of HCl emissions from lime kilns would be well under the threshold levels of concern for human receptors. *Id.* at 78055. To aid in its analysis, EPA reproduced several of NLA’s modeling analyses, performing its own analyses for selected facilities having the highest potential for risk to the surrounding community, and ultimately confirmed NLA’s assessment.

It is helpful to put these low risks in perspective. The Hazard Quotient (HQ) is the ratio of exposure (or modeled concentration) to the health reference value or threshold level (i.e. reference concentration (RfC) or acute exposure guidance level (AEGL)). HQ values less than “1” indicate that exposures are below the health reference value or threshold level and are likely to be without appreciable risk of adverse effect in the exposed population. 67 Fed. Reg. 78,055-56 (Dec. 20, 2002). Based on an HCl risk assessment of all lime kilns in the industry, EPA felt confident that exposures to HCl emissions from lime manufacturing facilities are unlikely to ever exceed an HQ of 0.2. *Id.* at 78,056. In other words, risks from HCl emissions from lime plants have a more than adequate “ample margin of safety” because they are expected to be significantly lower than the level at which there would likely be no appreciable risk (i.e., an HQ of 1.0).

EPA’s conclusions were validated in its RTR review. In 2019, as part of the residual risk review, EPA performed a comprehensive risk assessment for all 35 operating lime plants that are major sources of HAP. The maximum chronic noncancer hazard index (HI) for the lime manufacturing source category was estimated by EPA to be only 0.04 based on actual emission of HCl, nickel compounds, and acrolein emitted from lime kiln and cooler exhaust, and 0.05 based on allowable emissions, with HCl, nickel compounds, acrolein, and formaldehyde emissions as primary risk drivers, 85 Fed. Reg. 44,964 (July 24, 2020). In other words, when EPA did its follow-up residual risk assessment using representative data under actual and allowable emissions scenarios, it found that the chronic risks from all noncancer HAP (including, but not limited to HCl) were much lower than the risks estimated in 2002, and even further from an HI of 1.0. This analysis proves that EPA was correct in determining that risks from uncontrolled emissions of HCl are acceptable with an ample margin of safety.

EPA also evaluated whether HCl emissions would cause any significant or widespread adverse environmental effects to wildlife, aquatic life, or other natural resources, ultimately concluding, “we do not anticipate any adverse ecological effects from HCl.” *Id.* at 78057.

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<sup>23</sup> In the preamble to the proposed lime MACT standard in 2002, EPA noted that the Agency had included a detailed discussion of factors it considers in deciding whether a pollutant should be categorized as a health threshold pollutant in its proposed rule titled: *National Emission Standards for Hazardous Air Pollutants; Proposed Standards for Hazardous Air Pollutants From Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semicheical Pulp Mills*. 63 Fed. Reg. 18,766 (April 15, 1998).

Putting all this evidence together, EPA correctly concluded that “[t]he results of the exposure assessment showed that exposure levels to baseline HCl emissions from lime production facilities are well below the health threshold value.” *Id.* In sum, EPA concluded that HCl was a threshold pollutant and that the risks from emissions of HCl from lime manufacturing facilities were below such threshold value. No party challenged this conclusion, and the time for making any such challenge has long since passed. *See* CAA § 307(b)(1), 42 U.S.C. § 7607(b)(1). Accordingly, that conclusion is the “law of the case,” and must be respected in this rulemaking proceeding.<sup>24</sup>

In its recent RTR rule for lime manufacturing facilities, EPA hired an outside contractor to assist the Agency in conducting a new comprehensive risk assessment for all hazardous air pollutants (including HCl). This new analysis found that the risks of lime manufacturing under the current MACT standard (which contains no HCl standard at all, let alone a health-based standard) were “acceptable” and that the “current NESHAP provides an ample margin of safety to protect public health.” 85 Fed. Reg. 44,960. EPA’s RTR fact sheet describing the conclusions of the risk assessment states that the “maximum individual cancer risk . . . for inhalation for the source category is estimated to be 1-in-1 million,” and that this data supported the conclusion that risks from lime manufacturing source category were acceptable and safe. EPA, *Fact Sheet: Proposed Amendments to Air Toxics Standards for Lime Manufacturing Plants*, June, 2020.<sup>25</sup> As such, because EPA concluded that there are no health or safety risks under the current lime NESHAP, if EPA issues any standard at all, it should issue a health-based standard for HCl, as it would more than adequately protect the public and is based on the best available science.

EPA itself recently concluded that HCl is not a carcinogen. On November 18, 2021, EPA issued a final RTR for the flexible polyurethane foam fabrication operations industry. *National Emission Standards for Hazardous Air Pollutants: Flexible Polyurethane Foam Fabrication Operations Residual Risk and Technology Review and Flexible Polyurethane Foam Production and Fabrication Area Source Technology Review*, 86 Fed. Reg. 64385 (Nov. 18, 2021). These facilities emit HCl, and EPA promulgated standards for HCl, but EPA specifically concluded that “no carcinogens are emitted by this category.” 86 Fed. Reg. 64391-92. Several other RTRs have confirmed that EPA’s longstanding position is that HCl is not a carcinogen. *See National Emission Standards for Hazardous Air Pollutants: Asphalt Processing and Asphalt Roofing Manufacturing Residual Risk and Technology Review*, 85 Fed. Reg. 14526, 14535 (Mar. 12, 2020) (citing to the International Agency for Research on Cancer’s conclusion that HCl is “not classifiable as to its carcinogenicity to humans”); *National Emission Standards for Hazardous Air Pollutants: Hydrochloric Acid Production Residual Risk and Technology Review*, 85 Fed. Reg. 20855, 20861 (Apr. 15, 2020) (“[t]he results of the inhalation cancer risk assessment . . . indicate there is no quantifiable cancer risk posed by the source category. . . . HCl is not classifiable as a human carcinogen”).

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<sup>24</sup> As noted above, in 2004, after EPA decided that HCl was a threshold pollutant entitled to a health-based standard under 112(d)(4), EPA ultimately determined that the risks were so low that no standard was justified. If EPA had set a health-based standard—even a very high one that all sources would have met—there could be no claim now that EPA failed to adequately address HCl. For EPA to now set a non-health-based standard without explanation would be arbitrary and capricious and contrary to its own prior decisions.

<sup>25</sup> [https://www.epa.gov/sites/default/files/2020-06/documents/lime\\_manufacturing\\_rtr\\_final\\_fs.pdf](https://www.epa.gov/sites/default/files/2020-06/documents/lime_manufacturing_rtr_final_fs.pdf)

In the absence of new information or new law, for EPA to reverse its prior decision that HCl is a threshold pollutant for the lime industry would be arbitrary and capricious. As explained below, the recent *Sierra Club* decision in the brick/clay MACT rule does not provide any such new information or law. As noted above, newer information (including the Ramboll) report, only serves to strengthen the determination that HCl is a threshold pollutant. Thus, EPA may not reverse its prior decision on this topic and should promulgate a health-based standard for HCl.

**B. EPA is Not Constrained by the Brick/Clay *Sierra Club* MACT Case because Lime Manufacturing Is Clearly Distinguishable from That Case in All Its Key Factual/Technical/Legal Conclusions**

In 2018, the Sierra Club and others challenged EPA's use of a health-based standard for HCl in the MACT standard for the brick/clay industry. *Sierra Club v. EPA*, 895 F.3d 1 (D.C. Cir. 2018). The court agreed with the Sierra Club and rejected EPA's use of such a standard for three reasons discussed below. Critically for our purposes here, given current knowledge on HCl and the facts in the lime industry, none of these reasons is either relevant today, or can be used to deny use of a health-based standard for HCl for the lime manufacturing RTR.

First, the court held that EPA had not met the section 112(d)(4) requirement that a health threshold be "established." *Id.* at 10-11. EPA had reviewed toxicity assessments in several databases and opinions from scientific bodies and found that none classified HCl as carcinogenic or "suggestive of the potential to be carcinogenic." *Id.* However, the court held that EPA had not provided a sufficient record to determine that there was no cancer risk. EPA, the court stated, noted that "little research" had been conducted on carcinogenicity of HCl. Ultimately, the court characterized EPA as relying on the "lack of *any* significant studies." *Id.* (emphasis in original). Therefore, the court held that EPA acted unreasonably by concluding that it is "established" that HCl poses no cancer risk. *Id.*

The overwhelming scientific consensus regarding the non-carcinogenicity of HCl is widely accepted and compels the conclusion that HCl does not cause cancer. To aid in promulgation of the revised RTR, NLA engaged toxicology experts from the firm Ramboll to prepare a report on the carcinogenicity of HCl, which NLA provided to EPA on June 29, 2021 (EPA-HQ-OAR-2017-0015-0073). In contrast to the insufficient record that served as the basis for the *Sierra Club* court's holding, Ramboll concluded that "HCl has not been identified as a carcinogen, either by authoritative reviews or Ramboll's own search of the scientific literature, despite its long history of use." Ramboll, "Evaluation of the Carcinogenicity of Hydrochloric Acid (HCl) and HCl Mist," (June 11, 2021) ("Ramboll Report"). Ramboll stated:

HCl has been the subject of toxicity studies in experimental animals and epidemiological studies in exposed workers. Several authoritative groups (including the World Health Organization's International Agency for Research on Cancer [IARC], the International Programme on Chemical Safety [IPCS], and the international Organisation for Economic Co-operation and Development [OECD]), have conducted evaluations of the carcinogenic potential of HCl. None of these groups have concluded that HCl is a carcinogen. Other authoritative bodies (including the US



Environmental Protection Agency and the US National Toxicology Program) have chosen not to evaluate the carcinogenicity of HCl, estimating that carcinogenicity is unlikely based on its physical, chemical, and corrosive properties and the lack of evidence suggesting an association with cancer.

...

In addition to relying upon previous authoritative reviews, Ramboll did a series of additional literature searches for any new studies which might indicate HCl is a carcinogen. We employed several search strategies to make sure we uncovered any new scientific evidence that may not have been considered by previous assessments. Despite this broad search, we identified only six additional publications. This newer evidence is consistent with the earlier body of scientific evidence. In addition to direct studies of cancer associations, we also examined other supporting evidence in the form of genotoxicity studies or potential to induce cell proliferation. Taking both the epidemiological and toxicological data into account, the evidence does not indicate that HCl is a carcinogen.

Ramboll Report, Executive Summary. These conclusions satisfy the requirements of the *Sierra Club* decision, and thus, for purposes of the lime manufacturing RTR revisions, HCl should be considered a health threshold pollutant.

The second basis for the *Sierra Club* court's rejection of EPA's characterization of HCl as a threshold pollutant was the court's conclusion that EPA used only a single-low confidence, low-quality risk assessment in its review, and that EPA did not use a more stringent California EPA ("CalEPA") reference concentration for HCl that does not pose a health risk. 895 F.3d at 12. This concern does not apply to the lime RTR. The lime RTR risk assessment performed by EPA included multiple, robust dose-response assessments, *including* CalEPA chronic and acute inhalation reference exposure levels ("RELS")<sup>26 27</sup> The EPA risk assessment found no unacceptable human health risk due to chronic or acute inhalation exposure.

Use of the CalEPA REL in the RTR risk assessment, combined with the Ramboll study, demonstrate that in utilizing a health-based threshold for HCl in the revised lime RTR, EPA would not be relying on a "single low-confidence, low-quality" risk assessment. Rather, EPA will be relying on a risk assessment that includes multiple robust dose-response assessments.

Finally, the *Sierra Club* court concluded that EPA's brick/clay health-based assessment was flawed because the court could not determine whether EPA provided any "ample margin of safety" in the HCl health threshold as required by section 112(d)(4). *Id.* at 13. This flaw in EPA's reasoning in the brick/clay context should be easily addressed in this rulemaking – EPA should

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<sup>26</sup> Residual Risk Assessment for the Lime Manufacturing Source Category in Support of the Risk and Technology Review 2019 Proposed Rule, EPA 2019, May, p. 27.

<sup>27</sup> CalEPA defines the REL as "the concentration level at or below which no health effects are anticipated in the general human population."

break out specifically and set forth in precise terms its “ample margin of safety” conclusions (which it already made in the context of the risk assessment performed for the RTR).

**C. Strong Policy Reasons Support Concluding that HCl Is a Threshold Pollutant and Promulgating a Section 112(d)(4) Standard**

In addition to the legal and technical arguments above, there are several strong policy reasons that should compel EPA to issue a section 112(d)(4) health-based standard for HCl in this rulemaking. First, institutionally, EPA should always seek to preserve its regulatory authority/flexibility in this context. And, given the powerful data in support of a health-based threshold here, if EPA concludes to the contrary, it is hard to see how EPA could ever demonstrate a health threshold under section 112(d)(4). The *Sierra Club* court held that EPA is not “obligated to conclusively resolve every scientific uncertainty before it issues regulation.” 895 F.3d at 10 (citations omitted). Specifically, relating to section 112(d)(4), the court held:

The statutory term “established” does not unambiguously require that the EPA prove its scientific conclusions beyond all possible doubt. Nor does the term “health threshold” require that the EPA find a specific threshold that lacks uncertainty. With respect to scientific conclusions, “established” and “health threshold” are ambiguous terms and we give deference to the EPA to the extent its interpretations fall within the bounds of reasonableness.

*Id.* Under this standard, there is little question that it would be reasonable for EPA to conclude that HCl is a threshold pollutant in the context of this rulemaking. Indeed, a conclusion to the contrary would be a harmful precedent, given the evidence here, and it could be read to deprive EPA of the flexibility to use health-based standards as provided under the statute. Regulating HCl using a health-based standard for lime is not only faithful to the intent of Congress in enacting section 112(d)(4) and to the D.C. Circuit’s concerns as expressed in the *Sierra Club* decision but is also a reasonable and appropriate exercise of EPA’s discretion in setting standards for pollution prevention that protect the public with an ample margin of safety.

Second, we understand that EPA may not want to make any decision regarding HCl as a threshold pollutant in this rulemaking until after it has made such a decision in the brick/clay or pulp and paper RTR rulemakings. The problem with that approach is that there is a deadline for EPA to issue the lime manufacturing rule, but there is no such deadline for the brick/clay or pulp and paper rulemakings. See *Blue Ridge Env'tl. Def. League v. Pruitt*, 261 F. Supp. 3d 53 (D.D.C. 2017). So, the lime manufacturing rule will likely be the first of these rules to be issued, and therefore the first instance in which the HCl threshold determination will be made. In other words, EPA will, of necessity, be required to make a determination regarding use of 112(d)(4) in the lime manufacturing rule before it does so in the other rules. Indeed, it is preferable to make this determination in the context of the lime rule, because of the robust record here regarding HCl: (1) EPA already determined that HCl is a threshold pollutant; and (2) there is a strong record both at the MACT and RTR rulemaking stages that would support an EPA determination to issue a section 112(d)(4) standard.

Third, EPA should make it clear that even if it believes that it must set standards pursuant to sections 112(d)(2) and (3) for previously unregulated HAPs, the provisions in the statute providing for alternative approaches to the methods described in 112(d)(2) and (3) remain available to the Agency. These include the provisions allowing a health-based standard under 112(d)(4), as well as the provisions providing for subcategories under 112(d)(1) and work practices under 112(h). In the case at hand, there is already a robust existing record in support of a section 112(d)(4) standard, and thus applying such a standard will not prolong the time needed to draft and promulgate a standard.

Use of a health-based standard under section 112(d)(4) is particularly appropriate here. EPA conducted two risk-based analyses and determined that there are no health risks from emissions of HCl from lime manufacturing facilities—the first being the Agency’s evaluation of HCl health-based risks in the original MACT rule, and the second being its section 112(f) risk analysis from the 2020 lime RTR rule that there are no unacceptable risks from any pollutants regulated by the MACT standard.

## **VIII. EPA ACTED REASONABLY IN SETTING SUBCATEGORIES FOR HCL**

As noted above, EPA should abide by its longstanding finding in 2004 that HCl is a threshold pollutant (and not a carcinogen) and should establish a health-based standard for HCl pursuant to Clean Air Act § 112(d)(4) in lieu of a MACT floor standard.

If, however, EPA continues to pursue non-health-based emissions standards for HCl, NLA supports the Agency’s proposal to establish subcategories. NLA supports the five subcategories EPA has proposed. EPA should also make several technical corrections to the subcategory analyses and MACT floors, as explained below.

### **A. EPA Has Flexibility to Set Standards for Subcategories**

Clean Air Act section 112(d)(1) provides: “The Administrator may distinguish among classes, types, and sizes of sources within a category or subcategory in establishing such standards except that, there shall be no delay in the compliance date for any standard applicable to any source under subsection (i) as the result of the authority provided by this sentence.” Under section 112(d)(3), the standard can be no less stringent than:

(A) the average emission limitation achieved by the best performing 12 percent of the existing sources (for which the Administrator has emissions information), excluding those sources that have, within 18 months before the emission standard is proposed or within 30 months before such standard is promulgated, whichever is later, first achieved a level of emission rate or emission reduction which complies, or would comply if the source is not subject to such standard, with the lowest achievable emission rate (as defined by section 7501 of this title) applicable to the source category and prevailing at the time, in the category or subcategory for categories and subcategories with 30 or more sources, or

(B) the average emission limitation achieved by the best performing 5 sources (for which the Administrator has or could reasonably obtain emissions information) in the category or subcategory for categories or subcategories with fewer than 30 sources.

Accordingly, if a subcategory has fewer than 30 sources, the standard is based on the average limitation achieved by the best performing 5 sources.

EPA's decision to set subcategories has been repeatedly upheld by the courts. In *Sierra Club v. EPA*, 895 F.3d 1 (D.C. Cir. 2018), the court upheld EPA's decision to establish subcategories for brick kilns by size. In setting a brick MACT floor, EPA set separate standards for PM (used as a surrogate for non-mercury hazardous metals) and mercury, with subcategories for large tunnel and small tunnel brick kilns. *NESHAP for Brick and Structural Clay Products Manufacturing; and NESHAP for Clay Ceramics Manufacturing*, 80 Fed. Reg. 65470, 65471 (Oct. 26, 2015). In *U.S. Sugar Corp. v. EPA*, 830 F.3d 579 (D.C. Cir. 2016), the court upheld EPA's establishment of subcategories for major boilers (based on primary fuel combusted and method used to feed the boiler), and for area boilers (based on size). The court held that EPA's creation of subcategories of boilers based on the type of fuel the boilers burned was based on a reasonable interpretation of CAA provisions permitting EPA to distinguish among "classes, types, and sizes" of sources when establishing hazardous air pollutant emissions standards, and was not arbitrary and capricious, even though a single boiler could use different fuels over the course of its lifetime. EPA explained that boilers varied in their designs depending on type of fuel they burned, which affected boiler emissions and the feasibility of emissions controls. *Id.* at 656. EPA demonstrated with sufficient evidence that burning a different fuel made a boiler a different type of boiler, and thus EPA's creation of subcategories of boilers based on the type of fuel the boilers burned was not arbitrary or capricious. *Id.* at 657.

In the Proposed Rule, EPA based its HCl subcategories on two factors that impact HCl emissions, as shown by data analyzed by EPA—kiln type (preheater rotary, straight rotary, and vertical), and lime product produced (high calcium lime and dolomitic lime). EPA reasonably determined that these differences in equipment and in product made resulted in differences in emissions that justify establishment of subcategories. NLA fully supports this determination, as explained in more detail below.

The proposed HCl subcategories for the lime manufacturing industry are based on kiln type (i.e., straight rotary, preheater rotary, and vertical), and lime product (high calcium quicklime or dolomitic lime). The five subcategories proposed by EPA are:

- a. Straight rotary kilns making dolomitic lime and dead-burned dolomitic lime
- b. Straight rotary kilns making high calcium quicklime
- c. Preheater rotary kilns making dolomitic lime and dead-burned dolomitic lime
- d. Preheater rotary kilns making high calcium quicklime
- e. Vertical kilns making any of the three types of lime identified above

NLA generally supports these subcategories, but requests that vertical kilns making dolomitic and dead-burned dolomitic lime be grouped with preheater kilns making dolomitic and dead-burned dolomitic lime, for reasons explained below.

These subcategories are explored in more detail below.

## **B. Subcategorization by Kiln Type Is Appropriate**

Subcategorization by kiln type includes the following:

- a. Straight Rotary kilns
- b. Preheater Rotary kilns
- c. Vertical kilns

HCl emissions from rotary kilns equipped with a preheater are typically lower than a straight rotary kiln with no preheater. This is because, among other things, HCl that exits the kiln can be chemically adsorbed by lime (CaO) and limestone (CaCO<sub>3</sub>) in the preheater section of the kiln. This has the overall effect of lowering HCl stack emissions. In addition, the stack temperature of a preheater kiln is lower than a straight rotary kiln, which lowers HCl formation.

Conversely, a straight rotary kiln with no preheater and similar inputs has HCl emissions higher than a preheater equivalent. Both kiln types will have some adsorption of HCl in the rotary kiln, but a straight rotary kiln does not have the additional opportunity for HCl adsorption in the preheater.

Vertical lime kilns also have a different emissions profile from straight kilns. In vertical kilns, close contact between the gases in the kiln and the stone and lime tends to scrub out HCl emissions.

## **C. Subcategorization by Lime Product Produced Is Appropriate**

In addition to kiln type, lime sources should be further subcategorized by product type, as EPA proposed:

- a. High calcium quicklime
- b. Dolomitic lime (and dead-burned dolomitic lime)

The data in the record show that kilns producing dolomitic lime consistently have significantly higher HCl emissions than kilns producing high calcium lime (this is true even when the two kinds of product are produced in the same kiln). These differences are due to differences in the stone feedstock, and not because of fuels or equipment. Dolomitic lime is made from naturally occurring stone with a higher percentage of magnesium chloride than high calcium quicklime. Also, it should be noted that dolomitic lime and high calcium quick lime are different products and have different uses and markets. Accordingly, the differences in HCl emissions between these two types of lime are appropriate for subcategorization.

**D. Request for Change in Subcategory for Vertical Kilns Making Dolomitic Lime**

Data submitted to EPA pursuant to the previous Information Collection Request (ICR) did not include data on vertical kilns producing dolomitic lime, so EPA grouped all vertical kilns into a single category. NLA believes, however, that for the purposes of categorizing HCl emissions, vertical kilns producing dolomitic lime should be grouped with preheater kilns producing dolomitic lime, because in this case, similarities related to product type are more significant than similarities in kiln equipment. These similarities are described in detail in Appendix F but can be summarized with the following points:

- Chloride concentrations in the stone are the primary driver in determining HCl emissions.
- Chloride concentration in dolomitic stone is higher than concentrations in high calcium limestone.
- Dolomitic limestone has less CaO and CaCO<sub>3</sub> than high calcium limestone. As a result, less HCl can be captured in a dolomitic kiln resulting in higher HCl emissions.
- Although vertical and preheater kilns are different in some ways, they are similar in that the exhaust gases flow through a bed of limestone allowing for inherent scrubbing of HCl to occur.<sup>28</sup>

This change will not alter any of EPA’s calculated MACT floors.

**E. Summary of Subcategories**

Table I below shows the subcategories that NLA believes EPA should establish for HCl emissions standards:

**Table I: Summary of Subcategories**

<b>Type of Kiln</b>	<b>Type of Lime</b>
Straight Rotary (SR)	Dolomitic Lime (DL) and Dead-Burned Dolomitic Lime (DB)
Straight Rotary (SR)	High-Calcium Quicklime (QL)
Preheater Rotary (PR) and Vertical (VK)	Dolomitic Lime (DL) and Dead-Burned Dolomitic Lime (DB)
Preheater Rotary (PR)	High-Calcium Quicklime (QL)
Vertical Kiln (VK)	High-Calcium Quicklime (QL)

<sup>28</sup> NLA is unaware of any vertical kilns making dead-burned dolomitic lime, but any such operations should be grouped with kilns making dolomitic lime due to the similarities in product type.

## IX. HCL—NEEDED TECHNICAL CHANGES AND CORRECTIONS

### A. The MACT Floor Calculations for HCl are Erroneous for the Straight Rotary High Calcium Quicklime (SR, QL) and Preheater Rotary, High Calcium Quicklime (PR, QL) Subcategories and Need Correction Due to the Miscategorization of a Lime Kiln.

In EPA's MACT floor analysis, five kilns were miscategorized as preheater rotary kilns, when in fact they are straight rotary kilns. Correcting this error will affect the MACT floor numbers for the SR, QL and PR, QL subcategories. One of these five kilns is identified in the MACT pool for the preheater quicklime (PR, QL) subcategory (108\_Carmeuse Lime and Stone\_Gary\_IN, Emissions Release Point ID Lime\_C02\_F02\_K03), but is in fact a straight rotary kiln. This error can be traced back to an error in the 2016 ICR response for this lime plant. (See Appendix G.) All the kilns are incorrectly identified as preheater kilns in that ICR response but are in fact straight rotary kilns.<sup>29</sup> The Carmeuse kiln should thus be removed from the PR QL kiln MACT pool, and the next lowest emitter (120\_Graymont, Inc. Gulliver\_MI, Emission Release Point ID Lime\_C05\_F01\_K01) should be part of that MACT pool.

Table 5 from document EPA-HQ-OAR-2017-0015-0135 assesses HCl emissions for the PR, QL subcategory. In this table, Kiln ID Lime\_C02\_F02\_K03 is incorrectly included in this subcategory. This kiln is a straight rotary kiln (it is not a preheater kiln) and therefore should be removed from Table 5 and be included in the SR, QL subcategory evaluation. Below, we have made this correction and included the results from this revision.

In order to address the identified error in EPA's HCl MACT Floor evaluations, we recomputed the HCl UPLs. Below, we have updated Tables 3, 5, 7, and 8 (as annotated in EPA's docket item EPA-HQ-OAR-2017-0015-0135), with corrections highlighted in yellow. Also attached to these comments as Appendix H (1-3) are corrected versions of the following spreadsheets included as attachments to EPA-HQ-OAR-2017-0015-0135:

- 095.03\_HCl\_UPL\_Ton\_SR\_Q\_Existing.xlsx
- 095.04\_HCl\_UPL\_Ton\_SR\_Q\_New.xlsx
- 095.06\_HCl\_UPL\_Ton\_PR\_Q\_Existing\_New.xlsx

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<sup>29</sup> Properly recharacterizing the other kilns in the relevant ICR response does not affect any MACT floor calculations.

**Table 3. Kilns and Average HCl Emission Rates for SR, QL Subcategory**

Facility ID	Emission Release Point ID	lb/ton of lime produced	Rank	MACT POOL
113_Carmeuse Lime and Stone_Grand River OH	Lime_C02_F07_K010 2	0.61	7	--
129_Graymont, Inc._Superior_WI	Lime_C05_F10_K04	0.57	6	--
109_Carmeuse Lime and Stone Butler KY	Lime_C02_F03_K09	0.52	5	Yes
129_Graymont, Inc._Superior_WI	Lime_C05_F10_K02	0.33	4	Yes
111_Carmeuse Lime and Stone_River Rouge MI	Lime_C02_F05_K02	0.32	3	Yes
124_Graymont, Inc._Pleasant Gap_PA	Lime_C05_F15_K02	0.012	2	Yes
108_Carmeuse Lime and Stone_Gary_IN	Lime_C02_F02_K03	0.010	1	Yes

**Table 5. Kilns and Average HCl Emission Rates for PR, QL Subcategory**

Facility ID	Emission Release Point ID	lb/ton of lime produced	Rank	MACT POOL
147_Pete Lien and Sons, Inc._Rapid City SD	Lime_C14_F01_K02	0.23	6	--
128_Graymont, Inc._Green Bay_WI	Lime_C05_F09_K02	0.12	5	--
109_Carmeuse Lime and Stone Butler KY	Lime_C02_F03_K11	0.10	4	--
110_Carmeuse Lime and Stone Maysville KY	Lime_C02_F04_K01	0.09	3	--
124_Graymont, Inc._Pleasant Gap_PA	Lime_C05_F15_K01	0.06	2	--
120_Graymont, Inc._Gulliver_MI	Lime_C05_F01_K01	0.04	1	Yes

**Table 7. Summary of Proposed Existing Source HCl Standards<sup>30</sup>**

Kiln Type	Lime Produced	Number of Runs	Distribution	UPL Result	Number of Sources	Average of Raw Data	Variance of Raw Data	Ratio of UPL to Average
SR	DL, DB	n>3	Lognormal	2.2	4 / 18	0.85	0.31	2.6
SR	Q	n>3	Lognormal	2.58	5 / 25	0.15	0.04	16.8
PR, [VK]	DL, DB	n=3	Lognormal	0.39	1 / 3	0.25	2.40E-03	1.5
PR	Q	n=3	Normal	0.096	1 / 3	0.042	9.00E-05	2.3
VK	Q, [DL, DB]	n=3	Normal	0.021	1 / 3	0.015	1.00E-06	1.4

<sup>30</sup> NLA is proposing that the final rule move vertical kilns making dolomitic lime to a different subcategory as discussed elsewhere in these comments, but that change will not affect any of these calculations. The requested changes are noted in brackets in Tables 7 and 8.



**Table 8. Summary of Proposed New Source HCl Standards<sup>31</sup>**

Kiln Type	Lime Produced	Number of Runs	Distribution	UPL Result	Number of Sources	Average of Raw Data	Variance of Raw Data	Ratio of UPL to Average
SR	DL, DB	n>3	Lognormal	1.6	1 / 5	0.55	0.13	3.0
SR	Q	n=3	Lognormal	0.015	1 / 13	0.01	2.89E-06	1.5
PR, [VK]	DL, DB	n=3	Lognormal	0.39	1 / 3	0.25	2.40E-03	1.5
PR	Q	n=3	Normal	0.096	1 / 3	0.042	9.00E-05	2.3
VK	Q, [DL, DB]	n=3	Normal	0.021	1 / 3	0.015	1.00E-06	1.4

The MACT floor limits that EPA should promulgate for the subcategories are summarized on Table II below:

**Table II: Corrected Hydrogen Chloride MACT Floor Limits for New and Existing Lime Manufacturing Sources**

Kiln Type <sup>1</sup>	Lime Produced <sup>2</sup>	New Source MACT Floor Limit (lb/ton of lime produced)	Existing Source MACT Floor Limit (lb/ton of lime produced)
SR	DL, DB	1.6	2.2
SR	QL	0.015	2.58
PR, VK	DL, DB	0.39	0.39
PR	QL	0.096	0.096
VK	QL	0.021	0.021

Note:

- 1 - Straight Rotary (SR), preheater rotary (PR), vertical (VK)
- 2 - Dolomitic lime (DL), high-calcium quicklime (QL), dead burned dolomite (DB)

**B. EPA Should Authorize Use of Method 26/26A to Measure HCl**

Method 26/26A should be allowed by EPA to determine compliance with the proposed HCl emissions limits. It appears that EPA inadvertently omitted Method 26/26A (used in testing HCl) from Table 7 in the preamble (88 Fed. Reg. 815), and from Table 5, Row 19, in the redline in the docket. Method 26/26A is a standard isokinetic method that can be run concurrently with PM sampling.

In Method 26/26A, gas is withdrawn from the source and collected directly in acidified impingers. The impinger solution captures the HCl, and drives it to chloride ions, where it is analyzed by ion-chromatography. This is a simple approach that does not have the sample transport difficulties found in the direct interface FTIR approach. It is one of EPA’s promulgated methods (*see* <https://www.epa.gov/emc/emc-promulgated-test-methods>), and it is allowed in other NESHAP rules (*see, e.g.*, 40.CFR section 63.7520 and Table 5 (boilers and process

<sup>31</sup> *Ibid.*

heaters). Method 26/26A has several advantages over the more technically complex and expensive M.320/321: it can allow for significantly lower detection limits, does not require a trained FTIR specialist on site to operate the equipment, and is significantly quicker. The limited availability of trained FTIR specialists will be problematic for both the lime industry and the testing industry. Additional costs are significant and can easily be greater than \$10K/plant using FTIR. M26/26A is a tried and tested accepted method for HCl analyses and is allowed for compliance demonstration in other industries. EPA should authorize the use of Method 26/26A as an approved method for HCl compliance testing.

## MERCURY

### X. EPA SHOULD APPLY AN INTRA-QUARRY VARIABILITY FACTOR FOR MERCURY

On December 9, 2021, NLA's consultant Trinity Consultants submitted a memorandum (EPA-HQ-OAR-2017-0015-0074), explaining how EPA should set an intra-quarry variability factor (IQV) for mercury for lime plants, with supporting data. In the Proposed Rule, EPA rejected this IQV approach for stated reasons that are incorrect, inconsistent with the concept of an IQV, and inconsistent with EPA's IQV approach in other rules.

The purpose of an IQV is to account for long-term variation in mercury content throughout the quarry (as EPA itself states in the Proposed Rule preamble, 88 Fed. Reg. 812), and has been incorporated into other standards with significantly fewer data than NLA industry has provided. In the Proposed Rule, EPA rejects establishment of an IQV due to a stated lack of data that would support an IQV. *Id.* However, despite EPA's assertion to the contrary, Graymont's Eden quarry Hg data meets this objective substantially better than kiln feed data. It is important to note that IQV stands for **intra**-quarry variability, not **inter**-quarry variability. The point of the exercise is to understand how mercury concentrations may vary in each quarry over time.

NLA believes that in a case in which emissions of mercury are not controlled by add-on pollution control devices, but rather depend on inputs from feedstocks, it would be arbitrary and capricious not to apply a reasonable IQV. Without an IQV, the MACT floor "best performer"—the source that currently has the lowest mercury emissions—could later find itself in violation of the standard if it is excavating limestone with higher mercury levels from a different part of the quarry. The concept of the MACT floor performers is that these sources can meet the standard without additional controls—something EPA cannot assert for mercury in this rulemaking without an IQV.

EPA asserts that insufficient data is available to establish an IQV (section 6.2 of document EPA-HQ-OAR-2017-0015-0135). As provided in Appendix I (1-13), the lime industry has 422 kiln feed samples as well as 61 samples from the Eden quarry. This is substantially more data than found in the docket for the Brick and Structural Clay Products NESHAP, yet EPA promulgated an IQV standard for that NESHAP. Nationwide, the Brick/Clay industry provided

167 samples and the final IQV used in calculating the mercury standard for their industry was based on seven samples from four plants.<sup>32</sup>

#### **A. EPA Should Adopt the IQV Suggested by NLA**

As stated in the preamble to the Proposed Rule, “an “intra-quarry variability” (IQV) factor would account for variability in the mercury content of the raw material over the long-term life of the quarry”.<sup>33</sup> NLA’s suggested approach to achieving this objective is well documented and supported by information that EPA had during its rulemaking process.<sup>34</sup> The data showed that intra-quarry variability of mercury in the real world is relatively high, and would have a significant impact on the mercury MACT floor. This is a strong justification for applying an IQV, not a reason for failing to do so.

The Eden quarry samples are more representative of this long-term variability than are kiln feed samples, because they represent limestone that will be used in the kiln over the life of the quarry. It is obvious that samples that represent the life of the quarry are far more representative of IQV than materials stockpiled over hours, days or a week in transient short-term stockpiles. As such, the originally proposed IQV based on data for the two MACT floor plants, which includes quarry samples from Eden and kiln feed samples from both plants, is appropriate for setting a UPL-based standard. In addition, EPA should use this quarry data because it represents the MACT floor source. EPA should use the IQV that NLA previously proposed to EPA.

As discussed in other sections of these comments, EPA asserts in the preamble that the Eden quarry mercury content data is not representative of kiln feed as it would be mixed with other stone collected from the quarry over time in piles.<sup>35</sup> EPA is simply mistaken in this assertion.

Stone from the quarry is stored in transient short-term stockpiles; however, stone is not maintained for long periods of time and piles are not intentionally blended in standard operating practice. The stone entering the pile will typically exit the pile and be fed to the kiln together over short time periods (i.e., hours or days)<sup>36</sup> – not over the longer time periods (i.e., years) which are more representative of the variations in mineral that occur at the associated on-site quarry. In addition, the samples from the quarry were taken from drill holes throughout the quarry and at approximately 6-foot intervals. As such, each sample represents a section of the quarry that would be mined over decades of quarry operation. So, it is clearly appropriate to look at data that represents the life of a quarry and not just the current portion of the quarry being mined. EPA should incorporate into the final rule the IQV that NLA suggested during the rule development process.

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<sup>32</sup> EPA-HQ-OAR-2013-0291-0660, Appendix E

<sup>33</sup> 88 Fed. Reg. at 812

<sup>34</sup> See EPA docket item EPA-HQ-OAR-2017-0015-0074. Trinity Consultants Hg IQV analysis.

<sup>35</sup> 88 Fed. Reg. at 812

<sup>36</sup> See Appendix J, a letter from an NLA member explaining that stone in a feed pile is processed within days.

**B. As an Alternative to NLA's Proposed IQV, EPA Could Consider an IQV Based on Nationwide Mercury Data**

Although the proposed IQV suggested by NLA is the most appropriate to represent long-term mercury variability over the life of a quarry at a MACT floor kiln, NLA and its consultant Trinity have also compiled kiln feed data nationwide and calculated a corresponding IQV. This data is provided in Appendix I along with calculations of an IQV and corresponding UPL.<sup>37</sup> This information was also provided to EPA in the original ICR for this rulemaking, providing a data-rich record for EPA to utilize on Hg in kiln feed. Using this methodology, the computed UPL standard with the IQV for existing QL and DL kilns would be 45.5 lb/MMton.<sup>38</sup>

**C. As Another Alternative, EPA Could Consider an IQV Based on Data from Three Plants in Alabama that Use the Same Limestone Formation.**

Although again, the IQV suggested by NLA is the most appropriate and in lieu of that, a nationwide IQV would be most representative for the lime industry, NLA and its consultant Trinity have also prepared an IQV analysis for three plants in Alabama that mine from the same limestone formation. These plants are located close together, and all are part of the Newala limestone formation.<sup>39</sup> There are 61 available mercury samples for limestone kiln feed taken between 2011 and 2013. This data is provided in Appendix I along with calculations of an IQV and corresponding UPL. Following the procedure used to calculate an IQV found in document EPA-HQ-OAR-2017-0015-0135\_attachment 10, the computed UPL standard with the IQV for existing QL and DL kilns would be 34.0 lb/MMton.

NLA again urges EPA to adopt the IQV NLA previously suggested as the best approach to reflecting intra-quarry variability, but at a minimum it should adopt one of the other two proposed IQV approaches. Given the Agency's historic support for this concept in other similar contexts; the compelling scientific basis and data supporting an IQV for lime manufacturing; and the Agency's lack of a rational argument for omitting such a factor, the failure of the Agency to adopt an IQV under such circumstances would be plainly arbitrary and capricious.

**XI. EPA ACTED PROPERLY IN PROPOSING SUBCATEGORIES FOR KILNS MAKING DEAD-BURNED DOLOMITE**

NLA supports EPA's proposal to establish subcategories for new and existing kilns manufacturing dead-burned dolomite, for the reasons set out in NLA's memorandum in the docket at EPA-HQ-OAR-2017-0015-0089.

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<sup>37</sup> The spreadsheets in Appendix I are being submitted in two forms: one version with the names of the specific lime plants redacted is being submitted with these comments through regulations.gov, and a second version of five of the spreadsheets (I1, I10, I11, I12, and I13) with the plant names included is being submitted under CBI procedures.

<sup>38</sup> Calculations for UPL standards are provided in Attachment I.

<sup>39</sup> <https://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=ALOn;6>

## **XII. EPA IMPROPERLY PROPOSES BEYOND-THE-FLOOR STANDARDS FOR MERCURY EMISSIONS**

EPA proposes to set beyond-the-floor emission standards for mercury emissions from existing sources for most lime plants, and for both existing and new sources for sources making dead-burned dolomitic lime. EPA's justification for this proposed action is flawed and is contrary to the Clean Air Act's provisions.

EPA's explanation for its proposed action is as follows:

For existing sources in each of the mercury subcategories we found it is cost-effective to set emissions limits that go beyond the calculated MACT floor limits. In the case of the quicklime and dolomitic lime subcategories, the new and existing MACT floor limits were similar in value (24.94 lb/MMton for new sources, and 25.58 lb/MMton for existing sources), such that with the suggested controls the existing sources would be able to comply with the new source standard with no additional costs. We therefore set the existing emission limit equal to the new source emission limit. For the dead burned dolomitic lime subcategory, we evaluated the use of APCD to control mercury from these sources and estimate that the cost effectiveness (\$/lb) associated with the installation of ACI controls is \$16,969 per pound of mercury removed. This cost-effectiveness value is well within the range that we have determined to be cost-effective for mercury in other rules, and therefore for the dead burned dolomitic lime subcategory we are proposing beyond-the-floor limits for new and existing sources based on the use of these controls.

88 Fed Reg. at 812.

EPA correctly notes that it must consider costs with respect to beyond-the-floor controls, as it is directed to do in Clean Air Act section 112(d). However, EPA omits a vital element in the analysis of the cost-effectiveness of an emissions standard—whether it will significantly reduce the risk imposed by the emissions to be controlled. In the case at hand, as recounted elsewhere in these comments, EPA performed a comprehensive risk assessment on all major sources in the lime industry in the 2020 RTR proceeding and determined that risks are acceptable at all major sources with an ample margin of safety *even with no additional controls for mercury at all*. Accordingly, it cannot be cost-effective to impose additional costs on any existing source because the lack of a health or environmental benefit does not justify any new costs.

This flaw in EPA's reasoning is particularly clear with respect to the subcategory for dead-burned dolomitic lime. Because it is a subcategory with only two existing sources at a single facility, those sources are the MACT floor, and they are uncontrolled. Thus, new emission standards should only be imposed if they are beyond the uncontrolled floor. In addition, EPA bases its cost-effectiveness determination solely on removal costs, with no consideration of the level of risk. But that risk assessment—as noted several times in these comments—included this source, and EPA already determined that the risks imposed justified no controls at all.

With respect to other existing sources, EPA makes the illogical claim that lowering the emission standard will not impose any additional costs on sources. This is obviously flawed—in

order to comply with any emissions standard, sources must calibrate pollution control devices to achieve the standard, with an appropriate margin of error to prevent violations. In this case, when the treatment technology EPA identifies for mercury control is activated carbon injection (ACI), the rate of injection—and thus the cost of carbon—will directly relate to the emissions standard. A lower standard means more carbon injected, and higher costs. Furthermore, existing plant configurations may not be able to accept higher rates of ACI due to operational constraints, further increasing costs. These additional costs cannot be justified by any consideration of costs compared to risks because EPA already determined that the risks do not justify any additional controls at all.

In sum, EPA should not set beyond-the-floor standards for mercury for any existing sources.<sup>40</sup>

## ORGANICS

### XIII. USE OF THC AS A SURROGATE FOR ORGANIC HAPS IS UNLAWFUL

On December 6, 2021, NLA submitted a memorandum (EPA-HQ-OAR-2017-0015-0068), with accompanying data, showing that THC should not be used as a surrogate for organic HAPs, because emissions of THC do not correlate with emissions of organic HAPs. EPA has not cited any data to support the use of THC as an appropriate surrogate but arbitrarily and unlawfully proposed to establish a THC standard for the lime industry as a surrogate for organic HAPs.

EPA can lawfully use surrogates for hazardous air pollutant (HAP) emissions under section 112(d)(3) of the Clean Air Act, but only if the chosen surrogates closely track the emissions of the regulated HAP. The DC Circuit has upheld EPA's use of surrogates for regulated HAPs as reasonable if, when control technology is used, the emissions of the surrogate are reduced in a way that corresponds with the reduction of the HAP. *National Lime Ass'n v. EPA*, 233 F.3d 625, 639 (D.C. Cir. 2000) (hereinafter "*National Lime*"). The D.C. Circuit established the following three-part test for evaluating whether the use of a surrogate is appropriate. EPA must determine that: (1) the relevant HAP is invariably present in the proposed surrogate; (2) control technologies for the proposed surrogate indiscriminately capture the relevant HAP along with other pollutants; and (3) the control of the surrogate is the only means by which facilities achieve reductions in emissions of the HAP. *Sierra Club v. EPA*, 353 F.3d 976 984 (D.C. Cir. 2004) (citing *National Lime*, 233 F.3d at 625); see also *U.S. Sugar Corp.*, 830 F.3d at 628 (the court's assessment of reasonableness "requires the surrogate's emissions to share a close relationship with the emissions of the [relevant HAP]") (holding that EPA had failed to adequately show how CO was a reasonable surrogate for oHAP from boilers). Applying this test, the court struck down EPA's selection of particulate matter as a surrogate for non-mercury HAP metals where EPA failed to substantively respond to commenters' concerns that PM was not an appropriate surrogate. *Sierra Club v. EPA*, 863 F.3d 834 (D.C. Cir. 2017) (citing to 79 Fed. Reg. 75,662 (Dec. 18, 2014)).

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<sup>40</sup> NLA supports EPA's proposal not to impose beyond-the-floor standards for any other pollutants, for the same reasons.

Because emissions of THC do not correlate to emissions of organic HAPs, EPA would act unlawfully if it set a MACT floor based on emissions of THC in a final rule. Clean Air Act section 112(d) directs EPA to set emission standards for *hazardous air pollutants*, and 112(d)(3)(A) provides that the MACT floor is to be based on “the average emission limitation achieved by the best performing 12 percent of the existing sources.” Here, the organic HAPs are the hazardous air pollutants that EPA is seeking to regulate, and because, as shown in the technical data below, there is no demonstrable correlation between emissions of THC and organic HAPs, EPA has failed to identify the best performing 12 percent of sources at controlling organic HAPs. There is no reason to believe that the lowest emitters of THC are also the lowest emitters of organic HAPs, because there is no correlation between those emissions.

In its Dec. 6, 2021, memorandum, NLA clearly demonstrated that THC was not an appropriate surrogate for organic HAPs. Testing by an NLA member company was conducted in 2015 concurrently for THC, and oHAPs at four kilns at four of its plants under normal operating conditions. Testing found no correlation between oHAP and THC. THC testing was performed concurrently with oHAP testing utilizing EPA Method 320 for aldehydes and EPA Method 18 for all other oHAP species. Methane was also speciated utilizing Method 320. The results are summarized on the table below.<sup>41</sup>

**Table III: Correlation Study Results**

Kiln	Production rate (tons/hour)	oHAP (ppmv at 7% O <sub>2</sub> )	THC (ppmv as CH <sub>4</sub> )	Comments
1	10.5	<0.55	1.66	THC primarily as CH <sub>4</sub>
2	11-14	<1.04	7.51	THC approximately 50% CH <sub>4</sub>
3	47	<0.72	8.28	THC primarily as CH <sub>4</sub>
4	26	<1.02	6.67	THC primarily as CH <sub>4</sub>

Test results were provided to the Agency in response to the 2016 ICR. As can be seen, THC does not track oHAP emissions. Subsequent testing in 2021 at two additional NLA member companies representing eight kilns at five lime plants similarly found no correlation between oHAP (tested using the same methodology) and THC tested concurrently (results are summarized in Attachment 1 to the Dec. 6, 2021, memorandum).

THC was used as a surrogate for organic HAPs in the Portland Cement MACT. An extensive data set was used in that rulemaking to identify a correlation between THC and organic HAP emissions from cement plants. No equivalent data set exists for the lime industry, and the available data indicate that there is no correlation. As mentioned above, testing by an NLA member company in 2015 at four kilns at four of its plants under normal operating conditions found no correlation between organic HAP and THC. NLA’s member company believes that the lack of correlation is in part because the THC emissions measured were dominated by methane, which is not a HAP, while organic HAPs were emitted at minimum method detection limit concentrations. This lack of correlation is unsurprising. Among organic compounds, lime kilns

<sup>41</sup> NLA’s submission and the accompanying data also demonstrated that carbon monoxide (CO) is also not an appropriate surrogate for organic HAPs. Because EPA does not appear to be considering CO as a surrogate, CO data is not included in this discussion, or the chart included in these comments.

emit mostly methane, with lesser quantities of ethane and propane. These substances are not classified by EPA as HAPs.<sup>42</sup>

NLA's prior submissions should have been sufficient to demonstrate to EPA that it should not use THC as a surrogate for organic HAPs. Nevertheless, NLA and its members are submitting additional information with these comments further demonstrating the point. A correlation analysis performed by an NLA member company on measured THC data and concurrent oHAP testing found a correlation coefficient ( $r^2$ ) of 0.24 based on 6 data points (Appendix K), *i.e.*, a very poor correlation. The analysis also includes a discussion of data from single shaft vertical kilns. Vertical kilns have certain unique and atypical emissions characteristics, discussed in more detail below, making use of THC as a surrogate particularly problematic for them.

In addition to the lack of correlation, EPA is incorrect in its assertion that control of THC will provide a commensurate level of control of organic HAPs. EPA asserts that:

Based on the EPA's assessment of the available test data, the EPA concludes that compliance with a THC emissions standard would, therefore, limit and control emissions of total organic HAP being emitted from the lime manufacturing process.<sup>43</sup>

EPA's assessment presumes that all organic species have the same destruction and removal efficiencies (DREs) with the candidate technologies. However, this statement is incorrect. Each oHAP species will be absorbed by carbon or combusted in an RTO differently (*i.e.*, each pollutant will have a different DRE), and thus will not be the same for the broad collection of total hydrocarbons. The matter of species-specific DREs becomes an increasingly critical aspect at the very low levels of pollutants emitted by lime kilns.

In terms of control by RTO, the temperature and residence time required for destruction of organic HAP's is dependent on the molecular structure and composition of the molecule. In 1979 and 1982, Lee and Hansen published a relationship which calculates the required destruction temperature for 99% and 99.9% DRE based on eleven (11) parameters: number of carbon atoms, aromatic species, C-C double bond, number of nitrogen atoms, autoignition temperature, number of oxygen atoms, number of sulfur atoms, hydrogen/carbon ratio, alkyl species, carbon-double-bond-chlorine interaction, residence time.<sup>44</sup> This method has been very instrumental in predicting required incineration temperature when empirical data is not available for organic species. The temperature for 99% DRE was estimated for 10 of the 12 HAP species identified in the Lime MACT proposed rule (Acetaldehyde, Formaldehyde, Benzene, Naphthalene, Styrene, Toluene, Xylene, Acrolein, Vinyl Chloride, and Carbon disulfide). Assuming a typical residence time of 0.5 seconds for an RTO the temperature for 99 % DRE was between 955 F (Acrolein) and 1395 F (Benzene). oHAP species which are aromatic in structure

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<sup>42</sup> See <https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications>.

<sup>43</sup> 88 Fed. Reg. at 813

<sup>44</sup> Lee, K. C., Morgan, N., Hansen, J. L., and Whipple, G. M. (1982). Revised model for the prediction of the time-temperature requirements for thermal destruction of dilute organic vapors and its usage for predicting compound destructibility. Paper presented at the 75th Annual Meeting of the Air Pollution Control Association, June, New Orleans, LA. And, Lee, K. C., Jahnes, H. J., and Macaulay, D. C. (1979). Thermal oxidation kinetics of selected organic compounds. Journal of Air Pollution Control Association.



were shown to require a higher combustion temperature and residence time for destruction thus indicated that oHAP/THC species are not controlled identically by an RTO.

With respect to treatment of THC/oHAP by carbon absorption, organic contaminants are often classified as weakly, moderately, or strongly adsorbed. A compound such as nitrobenzene having a molecular weight of 123 and a boiling point of 211 C is characterized as a very strong adsorber. On the other hand, a compound such as methane which has a molecular weight of 16 and a boiling point of -161 C is a very weakly adsorbed compound. In fact, at this capacity, for all practical purposes, methane removal with activated carbon would not be cost effective.<sup>45</sup> This outcome further supports that THC and oHAPs are not similarly controlled by carbon absorption.

In addition to the lack of correlation described above, use of THC as a surrogate will create unnecessary operational problems, especially for vertical kilns. Vertical kilns can have relatively elevated THC emissions, while concurrent o-HAPs from these kilns are extremely low, detected within the expected concentration range of between 1.0 – 3.0 ppmvd @7%O<sub>2</sub> in the stack (*see* Appendix K).<sup>46</sup> Some clean-burning kilns may periodically emit unburned fuel during normal operations either as countercurrent flow switches direction in twin-shaft vertical kilns, or due to incomplete air-fuel mixing (i.e., fluidized bed characteristics) in single shaft kilns. The release of non-hazardous unburned fuel during a compliance test could result in some vertical kilns failing the test, even if the emissions of organic HAPs are extremely low. This problem will only be exacerbated as aging rotary lime kilns in the U.S. fleet are retired and are replaced by state-of-the-art vertical kilns.

For these reasons, EPA's proposal to use THC as a surrogate for organic HAPs is arbitrary and capricious, and thus unlawful. As explained below, EPA should instead set an emission standard based upon analysis of aggregated organic HAPs. Such an alternative would be more accurate, more scientifically sound, and more protective by ensuring that actual organic HAP emissions (and not irrelevant surrogate substances) are being properly controlled.

#### **XIV. EPA SHOULD SET AN AGGREGATED (TOTAL) ORGANIC HAP STANDARD, OR AT A MINIMUM SET SUCH A STANDARD AS AN ALTERNATIVE TO A THC STANDARD**

##### **A. EPA Should Set a Standard Based on Organic HAPs Detected and Measured at Lime Plants**

In the same December 6, 2021, memorandum (EPA-HQ-OAR-2017-0015-0068) referenced above, NLA urged EPA to adopt an emission standard based on an aggregate of organic HAPs, similar to the alternative that was provided to the cement industry. EPA declined to adopt NLA's suggestion, on the grounds that the oHAP data was incomplete, and invited

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<sup>45</sup> Activated Carbon Adsorption for Treatment of VOC Emissions. Austin Shepherd, P.E., C.I.H., Technical Director, CARBTROL Corporation. Presented at the 13th Annual EnviroExpo, Boston Massachusetts—May 2001.

<sup>46</sup> It should be noted that there are also examples of rotary kilns with relatively higher THC emissions but with OHAPS at or below detection limits.

submission of more information to support such an alternative. EPA also identified several additional organic HAPs in the Proposed Rule preamble that it believed should be considered.

NLA has now performed, with the help of a technical consultant (Alliance Analytical Services), a comprehensive review of oHAP testing done during the rule development period. Rather than focusing only on the nine oHAPs that were previously submitted, the consultant thoroughly reviewed the Method 320 spectra from twelve stack tests conducted at major source lime kilns in order to identify all detectable oHAPs in the tests. This review has resulted in the identification of six additional oHAPs (including the four identified by EPA), providing a complete picture of oHAPs present using approved test methods, as shown on Table IV below. These oHAP are 1,3-butadiene, acrolein, carbon disulfide, ethylbenzene, vinyl chloride, and methanol. No additional organic HAPs were positively identified (see Appendix L). A second test company also performed a retroactive review of Method 320 FTIR on eleven stack tests and also confirmed the presence of 1,3,-butadiene, acrolein, and methanol (Appendix M). Note that the six oHAPs identified in the retroactive review include the four oHAPs identified in the proposed rule by EPA (acrolein, carbon disulfide, ethylbenzene, and vinyl chloride).

Also shown in the table below are representative method detection limits in parts per million (ppm) as provided by Alliance, adjusted to seven percent oxygen. The proposed detection limits are commonly achievable detection limits using standard analytical equipment for each of the proposed organic HAP. Alliance determined for each of the organic HAP the expected method detection level for each respective method based on internal experience and overall achievability for the particular method (*see* Appendix N for an explanation of the detection limits).

The test data analyzed by Alliance for this set of M.320 data was collected on 0.5 wavenumber MKS 2030 FTIRs, with a nominal pathlength of 5.11 meters. This represents the most common FTIR instrumentation currently utilized in source emissions testing in the U.S. The data are an amalgamation of results from multiple instruments across multiple sources. In cases where no direct data exists, estimates were made by experts in spectroscopy based on the amount of absorbance exhibited by the compounds, and the potential for overlapping interferences. An explanatory cover memo from Alliance is included in Appendix N.

The following table thus includes the complete list of identified oHAPs that should be included in an aggregated oHAP alternative. This list includes (a) all organic HAP detected using approved EPA methods M.18 and M.320 and specific to lime kilns identified in stack test reports provided to the Agency in the 2016 section 114 ICR, and as part of a voluntary collection effort by the industry in 2021-22, and (b) 6 additional oHAPs identified by the new review of the test spectra as referred to above, included all four of the additional oHAPs identified by EPA in the Proposed Rule preamble (88 Fed. Reg. 813). The frequency of detection for each HAP is also shown.

**Table IV: Organic HAP from Lime Kilns and Representative Method Detection Limits  
Parts per Million Adjusted to 7 Percent O<sub>2</sub>, Dry<sup>1</sup>**

PARAMETER	Analytical Method	RDL (ppm)	3x RDL	Frequency of Detection <sup>3</sup>
Benzene	M.18	0.025	0.075	8/16
Carbon Disulfide <sup>2</sup>	M.18	0.201	0.603	4/12
Ethyl Benzene <sup>2</sup>	M.18	0.024	0.072	6/10
Naphthalene	M.18	0.0068	0.020	4/12
Styrene	M.18	0.0036	0.011	4/14
Toluene	M.18	0.011	0.033	6/16
Vinyl Chloride <sup>2</sup>	M.18	0.268	0.804	7/12
Xylenes (Mixture of o, m, and p Isomers) <sup>4</sup>	M.18	0.0235	0.071	9/26
1,3-Butadiene <sup>5</sup>	M.320	0.268	0.804	7/12
Acetaldehyde	M.320	0.596	1.788	4/14
Acrolein <sup>2,5</sup>	M.320	0.670	2.010	2/12
Formaldehyde	M.320	0.521	1.563	8/14
Methanol <sup>5</sup>	M.320	0.223	0.669	8/12
<b>TOTAL</b>		<b>2.8</b>	<b>8.5</b>	<b>77/182 (42%)</b>

**Notes**

1. Assumes 10 percent moisture content.
2. In the Proposed Rule preamble, EPA “also identified additional organic HAP pollutants in the analyses including the pollutants acrolein, carbon disulfide, ethyl benzene, and vinyl chloride.” These HAPs were also identified in the retroactive review of M.320 FTIR spectra from 12 samples.
3. Frequency of Detection using approved EPA methods i.e., M.18 and M.320 from stack tests provided in 2016 ICR, supplemental test data provided by industry, and retroactive M.320 review performed by Alliance
4. Detection limit shown for xylenes is the sum of individual isomers (o-xylene = 0.0073, m-xylene = 0.0075, p-xylene = 0.0087) (all ppmvd@7% O<sub>2</sub>).
5. HAP was detected as part of retroactive review of M.320 FTIR spectra from 12 samples.

The representative detection limits were multiplied by three and then summed for an aggregate total of 8.5 ppmv at 7% O<sub>2</sub> dry, assuming 10 percent moisture content. This aggregated limit should be selected as a reasonable threshold for organic HAP based on the specificity of the HAP emitted from lime kilns combined with the low concentration and detection frequency.

In its 2017 Risk Assessment for the RTR rule, EPA modeled 12 additional HAPs not included on the list above. Five of these (4-nitrophenol, carbon tetrachloride, chloroform, pentachlorophenol, and phenol) were analyzed for but not detected. Because these HAP were analyzed for but not detected, they should not be included in the aggregated oHAP approach.

Seven additional HAPs in the Risk Assessment were detected using method TO-15. These were acetophenone, chlorobenzene, hexane, methyl bromide, methylene chloride, methyl chloride, and propionaldehyde. The laboratory M.320 FTIR spectra review performed by Alliance did not detect any evidence of their presence nor any measured results. NLA believes that because these substances were not detected using either Method 18 or 320, they should not be included in the oHAP aggregate. However, their respective detection limits (provided by

Alliance), multiplied by three, and aggregated is shown below. Inclusion of all seven of these oHAPs would increase the aggregate number from 8.5 to 19.1.

**Table V: Organic HAPs Detected with Method TO-15**

HAP	RDL (ppm)	3 x RDL
Acetophenone	0.007	0.022
Chlorobenzene	0.020	0.060
Hexane	0.034	0.101
Methyl Bromide	1.61	4.83
Methyl Chloride (chloromethane)	0.80	2.40
Methylene Chloride (dichloromethane)	NA (lab contaminant)	--
Propionaldehyde	1.07	3.22
	<b>TOTAL</b>	<b>10.6</b>

Thus, an appropriate approach is to develop a comprehensive, defensible list of organic HAPs detected by approved methods, and aggregate three times the RDL for each individual oHAP. The list of oHAP should only include those shown on Table IV above. These oHAPs represent those positively detected using approved EPA methods 18 and 320, plus additional oHAPs referenced by EPA in the Proposed Rule. The aggregated oHAP standard for 15 organic oHAPs under this approach is 8.5 ppmvd @ 7% O<sub>2</sub>.

NLA's proposal for an oHAP limitation is technically superior to and consistent with the Clean Air Act and EPA's precedents in establishing MACT emissions limitations. As noted above, THC is an inappropriate surrogate for organic HAPs in the lime industry. An aggregated (total) oHAP limit, on the other hand, is a better option because it causes the allowable emission limit to be directly linked to the regulated pollutants and excludes irrelevant substances that THC would include. The use of an aggregated oHAP alternative was used in the Portland Cement MACT, recognizing inherent differences in emissions of oHAPs and THC from cement kilns. Lastly, the proposed aggregate oHAP limit follows established conventions that EPA is proposing for D/F in this rulemaking. The limit for D/F is based on the aggregate amount of D/F congeners and given their very low levels below detection limits, the use of three times the Representative Detection Limit (3xRDL) setting method is appropriate in such cases.<sup>47,48</sup>

Use of an aggregated oHAP limit is also appropriate here because of the very low oHAP emissions, the very low detection limits for many of the substances, the sporadic appearance of these substances (note that no HAP listed above appeared in all tests, and many were not detected in a majority of tests),<sup>49</sup> and EPA's prior determination that risks from organic HAPs

<sup>47</sup> See EPA Docket Item: EPA-HQ-OAR-2017-0015-0117. Memorandum from Steffan Johnson, USEPA Regarding Determination of "non-detect" from EPA Method 29 (multi-metals) and EPA Method 23 (dioxin/furan) test data when evaluating the setting of MACT floors versus establishing work practice standards.

<sup>48</sup> See EPA Docket Item: EPA-HQ-OAR-2017-0015-0112. Memorandum to Docket EPA-HQ-OAR-2002-0058 from Peter Westlin, EPA/OAQPS/SPPD regarding Measurement Detection Capabilities for EPA for Instrumental Test Methods.

<sup>49</sup> Another reason THC should not be used as a surrogate for oHAPs is that no single oHAP is "invariably present" in the proposed surrogate as required in *Sierra Club v. EPA*, 353 F.3d 976 984 (D.C. Cir. 2004).

are acceptable with an ample margin of safety even with no additional controls at all. Overall, the use of an aggregated organic HAP limitation is superior to THC as a surrogate and should be incorporated into the final rulemaking.

Thus, EPA should use the aggregated oHAP approach as the emission standard for lime plants, and THC should not be used at all. Under this approach, sources would perform 5-year compliance testing for all the oHAPs on the list, and compliance would be based on the total aggregate detected being lower than the aggregate standard. Continuous compliance would be ensured by parametric monitoring of air pollution control devices.

Although NLA believes that only a standalone aggregate oHAP standard is legally and scientifically justified, EPA could consider two other approaches: (1) establish two alternative standards, one for THC, and one for aggregated oHAP, and allow achievement of either standard to constitute compliance, or (2) establish a THC standard, with an alternative scaled THC standard based on the oHAP alternative (similar to the approach used in the cement MACT, but using the oHAP list in Table IV above). Although these options would be better than a THC standard alone, they still suffer from the fatal defect that THC is not a lawful surrogate for organic HAPs.

## **DIOXINS/FURANS**

### **XV. EPA LACKS SUFFICIENT DATA TO SET A MACT FLOOR FOR DIOXINS AND FURANS, AND SHOULD ISSUE A NEW ICR FOR DIOXIN/FURAN DATA**

EPA proposes to set a MACT floor for dioxins and furans (D/F) for all major lime sources based on data from only two lime kilns—one with non-detectable amounts of D/F, and another with very low but detectable amounts. EPA rejected all other D/F data submitted by the industry based on determinations that the test methods used were not recognized by the Agency, or for other technical reasons. Based on these two data points, EPA proposes to set a MACT floor for the entire industry—96 lime kilns—assuming that MACT floor for the industry should be set based on non-detectable amounts of D/F.

EPA provides no data indicating that the tests from these two lime kilns—either individually or taken together—are representative of the emissions of the lime industry. It is arbitrary and capricious for EPA to set a standard based on such limited data. *Chem. Mfg. Ass'n v EPA*, 28 F.3d 1259, 1268 (D.C. Cir. 1994) (“...we conclude that it was arbitrary and capricious for the EPA to list MDI as a highrisk pollutant solely upon the basis of the RfC for MDI, without identifying any serious health effect with which it has ever been associated”). EPA should withdraw the proposed D/F standard and should issue a new Information Collection Request in order to collect sufficient data to make a statistically valid determination of a proper MACT standard.

Pursuing a new Information Collection Request for D/F would have multiple benefits. First, and most importantly, it would permit EPA to establish emission standards based on genuinely representative data from the industry. Second, if sufficient results are non-detect, it would permit EPA to consider setting a work practice for D/F, as it originally intended to do.

Third, comprehensive data may show that subcategories would be appropriate for lime plants emitting D/F, based on type of equipment or type of product being manufactured, as was the case for HCl.

In the alternative, EPA's lack of adequate data should support the establishment of a work practice for D/F. When EPA does not have sufficient HAP data to set a numeric standard, the D.C. Circuit has upheld EPA's promulgation of a non-numeric work practice standard. *Chesapeake Climate Action Network v. EPA*, 952 F.3d 310, 315 (D.C. Cir. 2020).

Finally, EPA should consider the alternative of setting no standard for D/F at all as the Agency did in 2004. EPA already established that D/F emissions from lime manufacturing processes are negligible.<sup>50</sup> Accordingly, such emissions are *de minimis*, and do not require an emissions standard. *Alabama Power Co. v. Costle*, 636 F.2d 323, 400 (D.C. Cir. 1979) (describing EPA's discretion to exempt certain *de minimis* releases from regulation under the Clean Air Act). Such a standard is clearly not "necessary" under the terms of the *LEAN* decision and the Clean Air Act.

## **XVI. IN THE ALTERNATIVE, EPA SHOULD SET A WORK PRACTICE FOR DIOXINS/FURANS**

During the development of the Proposed Rule, EPA repeatedly and consistently informed NLA that the Agency was planning to issue a work practice for dioxins and furans, because, according to EPA, the Agency had D/F data showing that more than 55% of test results were non-detect, thus permitting EPA to establish a work practice. NLA and EPA had multiple discussions on the form a work practice would take, and NLA submitted a suggested work practice. *See* EPA-HQ-OAR-2017-0015-0090 and attachment. NLA noted that due to the extremely low D/F emissions, an appropriate work practice would require sources to properly operate the air pollution control devices already in place to control particulate matter. However, in the Proposed Rule, EPA for the first time indicated that it did not have sufficient non-detect data to support a work practice, and instead set a MACT floor based on data from a single lime kiln.<sup>51</sup>

It is unscientific and arbitrary and capricious for EPA to take the position that a single non-detect result and a single detect result is insufficient for EPA to set a work practice on the grounds that there are not 55% non-detects, especially since EPA rejected other non-detect results on technical grounds. If EPA does not issue a new ICR, it should establish the work practice suggested by NLA.

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<sup>50</sup> *See* EPA Docket No. A-95-41, Item No. II-B-121. ("Emissions of dioxin and furan congeners are well-documented but are shown to be emitted in extremely small quantities; therefore, dioxin and furan data were not collected in this search.")

<sup>51</sup> NLA notes that the only work practice discussed in the docket materials is that requested by NLA. If EPA decides to consider any different work practice, the rule will have to be withdrawn and repropoed.

## **XVII. D/F—REQUIRED TECHNICAL CHANGES AND CORRECTIONS**

If EPA chooses to promulgate a numerical emissions standard for dioxins and furans, the following technical corrections should be made.

### **A. The Proposed D/F Emissions Limit is Incorrect Based on EPA’s Proposed D/F Testing Requirements.**

EPA proposed a limit on D/F based on EPA’s Johnson memo. To properly utilize Reference Image 4-3 to obtain a limit, the stack gas sample volume, in dry standard cubic meter (dscm), is required to select the appropriate 3xRDL value. NLA concurs that a sample volume for D/F testing on a lime kiln should be 3 dscm (or less, desirably, given costs for testing and long sample collection times). However, EPA’s proposed D/F limit is set incorrectly in that it improperly references a sample collection volume of 4 dscm (and not 3 dscm as is included in the rulemaking). Thus, the proposed D/F limit is incorrect, and the correct D/F limit is 0.037 ng/dscm.<sup>52</sup>

### **B. The D/F Limit in Table 1 in the Redline Version of the Proposed Rule in the Docket Is Inconsistent with the Value Listed in the Chart in the Preamble, and It Is Unclear if this Limit Is to Be Corrected to 7% O<sub>2</sub>.**

EPA should correct the value and clarify units of the standard in Table 1 of the rule. (As noted in section A above, both the value in the redline and the value in the preamble chart are incorrect and should be amended to 0.037 ng/dscm.)

### **C. The TEF in Table 10 of the Proposed Rule Redline and EPA’s 2010 TEF Docket Document Do Not Match.**

In the preamble to the Proposed Rule, EPA states the following:

*Additionally, EPA is incorporating by reference “Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds” (EPA/100/R-10/005 December 2010), which is the source of the toxicity equivalent factors for dioxins and furans used in calculating the toxic equivalence quotient of the proposed dioxin and furan standard.*

88 Fed. Reg. 820 (Jan. 5, 2023)

Table 2 of the December 2010 document referenced in the preamble provides the recommended TEFs for D/F that are apparently incorporated by reference. However, Table 10 in

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<sup>52</sup> See Reference Image 4-3: EPA Docket Item: EPA-HQ-OAR-2017-0015-0117. Memorandum from Steffan Johnson, USEPA Regarding Determination of “non-detect” from EPA Method 29 (multi-metals) and EPA Method 23 (dioxin/furan) test data when evaluating the setting of MACT floors versus establishing work practice standards, June 5, 2014.

the Proposed Rule redline contains incorrect TEF factors from 1989. This disparity could create confusion in future testing for D/F and should be corrected.

**Table VI: Illustration of D/F TEF Reference Errors from Rulemaking Redline and EPA’s Stated TEF Reference in the Federal Register**

**Table 2. Recommended toxicity equivalence factors (TEFs) for human health risk assessment of polychlorinated dibenzo-*p*-dioxins, dibenzofurans, and dioxin-like polychlorinated biphenyls**

Compound	TEF
Polychlorinated dibenzo- <i>p</i> -dioxins ( <i>PCDDs</i> )	
2,3,7,8-TCDD	1
1,2,3,7,8-PeCDD	1
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
OCDD	0.0003
Polychlorinated dibenzofurans ( <i>PCDFs</i> )	
2,3,7,8-TCDF	0.1
1,2,3,7,8-PeCDF	0.03
2,3,4,7,8-PeCDF	0.3
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
OCDF	0.0003

<b>Table 10 to Subpart AAAAA of Part 63— 1989 Toxic Equivalency Factors (TEFs)</b>	
2,3,7,8-TCDD	1
1,2,3,7,8-PeCDD	0.5
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
OCDD	0.001
2,3,7,8-TCDF	0.1
1,2,3,7,8-PeCDF	0.05
2,3,4,7,8-PeCDF	0.5
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
OCDF	0.01

**COMMENTS ON MONITORING**

As noted above, NLA supports EPA’s decision to base monitoring on periodic stack testing and parametric monitoring. However, some adjustments to the proposed parametric monitoring are needed.

**XVIII. EPA SHOULD MODIFY PARAMETRIC MONITORING REQUIREMENTS FOR PERIODS OF STARTUP AND SHUTDOWN**

The Proposed Rule requires sources to comply with emissions and operating limits at all times. Even though NLA endorses the use of periodic stack test and parametric monitoring to demonstrate continuous compliance, the Proposed Rule does not appropriately address how operating limits will be met during lime kiln startup or shutdown. During these periods, sorbent and carbon cannot be injected at the same rates as during normal operations, and operating conditions for RTOs differ as well.



NLA requests that EPA add the following (new) language to address applicable operating limits in the Proposed Rules during startup and shutdown.

When a lime kiln is in startup or shutdown (as defined in section 63.7143), the operating limits for sorbent and/or carbon injection do not apply and the lime kiln operator shall ensure that sorbent or carbon injection is in operation until the unit is no longer in startup or shutdown. When a lime kiln is in startup or shutdown (as defined in section 63.7143), the temperature limits for an RTO do not apply and the lime kiln operator shall ensure that the RTO is in operation until the unit is no longer in startup or shutdown.

**XIX. EPA SHOULD PERMIT USE OF APPROVED MONITORING APPROACHES (SUCH AS BAG LEAK DETECTION SYSTEMS) DURING STARTUP AND SHUTDOWN**

In the 2020 Lime MACT RTR rulemaking, EPA incorporated new requirements for startup and shutdown of kilns as it related to existing visible emissions standards. However, the final rulemaking did not specify how kilns already using approved monitoring systems other than continuous opacity monitoring systems (COMS), such as bag leak detection systems (BLDS), during normal operations should comply during startup and shutdown events.

Kilns in the lime industry have used BLDS (and other approved methods) for continuous compliance standards under the Lime MACT since its original inception in lieu of COMS. EPA, however, in several instances, has disapproved applications for Alternative Monitoring approaches proposing that a BLDS, like a COM, be allowed during Startup/Shutdown events. EPA should clarify this issue now and should make it clear that an approved method such as BLDS may be used during startup/shutdown events as they are allowed for use under normal operation. Therefore, we request the following provision be added to the regulation to clearly authorize use of these methods during startup/shutdown events.

When a lime kiln is in startup or shutdown, a lime kiln may use any method approved for use to show continuous compliance during normal operations (such as a bag leak detection system) to demonstrate proper operation of the baghouse as a surrogate to demonstrating compliance with visible emission limits during these events.

**ADDITIONAL COMMENTS AND CORRECTIONS**

**XX. EPA SHOULD PROVIDE THAT TESTING TO RESET OPERATING LIMITS DOES NOT VIOLATE STANDARDS**

The Proposed Rule states that operating limits must be complied with at all times. However, operators when seeking to reset operating limits require the ability to reset at the appropriate level at the time of the test, which may be at a lower level than the prior operating limit. The rule should clarify that a source is allowed to deviate from an existing operating limit when conducting a subsequent engineering evaluation or performance test. The rule should include the following language:

When a lime kiln emissions control device is being evaluated for engineering purposes or for performance testing purposes, the existing operating limits for the control device do not apply and variance from current operating limits is not a deviation.

#### **XXI. EPA SHOULD CORRECT LANGUAGE REFERRING TO SCRUBBERS**

The Proposed Rule misconstrues the difference between a PM (typically venturi) type scrubber and a WPTGA used to control acid gases which a lime kiln may need to install to comply with the new requirements of this rulemaking. This apparently led EPA to erroneously delete some references to PM in the rule language, when those references are intended to make clear that the provisions refer to scrubbers used to control PM. EPA should:

- (a) clarify the Proposed Rule by retaining all references to PM scrubbers in the existing rule language; and
- (b) ensure that references to setting parameter limits for PM scrubbers or acid gas scrubbers explicitly state that establishing operating parameters only apply when conducting performance tests for the specific pollutant being measured. For example, in Table 5, lines 8, 9, 14, and 15, deleting the scrubber flow rate reference to PM could imply that the PM scrubber flow rate requirement is to be reset for a performance test of any regulated HAP in the rule when it should only apply when completing a PM limit performance test. The reference to PM should be retained in those sections.

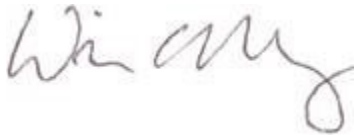
#### **XXII. IN TABLE 5, ROW 6, THERE IS A CALLOUT LABELLED “(REFER TO NOTE 1)” THAT APPEARS TO BE INCOMPLETE OR INCORRECT**

Note 1 on Table 5 (88 Fed. Reg. 815) relates to utilizing ASTM D6384-12e1 for HCl testing and does not appear to be relevant to Row 6. EPA should clarify what is the intended reference for Note 1.

**CONCLUSION**

NLA appreciates the opportunity to comment on these important issues.

Very truly yours,

A handwritten signature in grey ink, appearing to read "W. Herz".

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\*Appendices H, I, and P are being submitted separately because they consist of  
spreadsheets.

## APPENDIX A: REVIEW OF EPA'S COST AND TREATMENT EFFICACY DETERMINATIONS

### 1. EPA's control cost estimates are flawed and incomplete and not an accurate representation of the real economic impact to the industry and its small businesses.

#### 1.1. Control levels for dry sorbent injection (DSI) for HCl on existing lime kilns are not supported by the record or technical information available on controlling HCl from lime kilns.

A 98% control efficiency for HCl using DSI is unrealistically high and underestimates the economic impacts to the lime manufacturing plants subject to this rule. EPA's economic analysis does not provide any reasonable justification for the proposition that the candidate control technology can achieve the presumed control effectiveness levels on any lime kiln subject to this rulemaking. For example, EPA makes the presumption that a 98% control removal efficiency is achievable in practice for all lime kilns requiring control for HCl when EPA offers no data that this has ever been achieved in practice or for a process where the technology is legitimately transferable on a lime kiln regulated by this proposal.

EPA appears to suggest the control levels for DSI control for HCl on traditional combustion sources and/or brick and structural clay product tunnel kilns are transferable to lime kilns. That suggestion is technically flawed and simply affirms a lack of understanding of how different a tunnel kiln is from a lime kiln or how traditional combustion sources differ from lime kilns. Traditional combustion sources and tunnel kilns operate differently and have vastly different exhaust gas profiles than any type of lime kiln. The Brick/Ceramic and Clay Products industries use tunnel kilns, which heat preformed (molded) shapes, and are fueled using direct fired natural gas burners. Traditional combustion sources are simply fuel combustion devices. Neither are primarily engaged in calcination of a mineral, nor do they have continuously recirculating loads of crushed raw materials. The flue gas stream in tunnel kilns and traditional combustion sources have minimal particulate loading compared to lime kilns and end of pipe controls may be applied without the potential for fouling or counteractive chemical reactions for pollutants in the gas stream as would be the case in a lime kiln. Furthermore, the pollutants emitted during firing in tunnel kilns and traditional combustion devices are at an elevated concentration compared to a lime kiln where high levels of dilution air are present to manage the decarbonization of limestone necessary to make lime. Therefore, the flue gas composition of tunnel kilns/traditional combustion sources and lime kilns cannot be considered equivalent for technology transfer purposes nor for the expected control efficiencies as EPA apparently presumes.

#### 1.2. Control levels for activated carbon injection (ACI) on THC for existing lime kilns are not supported by the record or technical information available on controlling THC from lime kilns.

In EPA's economic analysis, EPA does not provide any reasonable justification for the proposition that the candidate control technology can achieve the projected control effectiveness on any lime kiln subject to this rulemaking. For example, EPA makes the unrealistically optimistic presumption that a 60% removal efficiency for THC is achievable in practice for a lime kiln requiring control with ACI. EPA offers no data that this has ever been achieved in practice on a process where the technology is transferable.

EPA's lone supporting reference in the docket is from an ACI supplier, and not an independent technical source. In fact, the information from the ACI supplier suggests that on most lime kilns, use of ACI to control THC is not achievable at the 60% control effectiveness level and that 10% percent control efficiency would be assumed conservatively for a lime kiln.<sup>53</sup> EPA omits the fact that in order to even theoretically achieve 60% control efficiency, the exhaust gas stream needs to be below 350F. The data in the ICR and in EPA's own economic model clearly indicate that exhaust gas temperature in a vast majority of lime kilns is well in excess of 350F. Thus, 60% control effectiveness is clearly not realistic by simply adding ACI to a lime kiln gas stream.

Therefore, assuming a blanket 60% control efficiency for THC using ACI at all lime kilns is unrealistic and dramatically underestimates the economic impacts to the lime manufacturing plants subject to this rule.

1.3. Applying more realistic assumptions on control efficiencies for THC and HCl using ACI and DSI respectively, indicates the true economic impact to the lime industry are dramatically greater than EPA's optimistic view.

If one assumes more realistically that HCl is controlled by 83% with DSI<sup>54</sup> and THC by 30% using ACI (although even these more realistic control levels have not been demonstrated in practice on any lime kiln), the economic impacts are potentially devastating to the industry. Changing **only** these two assumptions in EPA's own economic model would show the following real economic impacts to lime plants covered by this proposed regulation:<sup>55</sup>

- According to actual vendor estimates annualized costs to the industry would be approximately \$100M/year to the industry, as opposed to EPA's optimistic estimates of \$32MM/year.
- The industry would need to install more than 40 wet packed tower gas absorbers (WPTGAs, aka wet scrubbers) and not the zero WPTGAs that EPA predicts.

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<sup>53</sup> See EPA Docket Item: EPA-HQ-OAR-2017-0015-0133. Email from Matt Hakos, RTI International regarding ACI Capabilities for THC/TOCs. August 19, 2022

<sup>54</sup> See Appendix O, a letter from Lhoist North America indicating that the 98% removal efficiency quoted by EPA was observed only under specified conditions in industries other than the lime industry.

<sup>55</sup> See the cost calculation spreadsheet in Appendix P.

- More than 40 Regenerative Thermal Oxidizers (RTOs) would need to be installed, and not the 4 RTOs that EPA predicts.

Therefore, the economic impact to the industry, and in particular its small businesses, would be much greater than EPA estimated, even without addressing numerous other costs EPA failed to address.

1.4. In addition to the erroneous assumption on the effectiveness of DSI and ACI on lime kilns, EPA's analysis fails to account for a series of other economic factors that the industry will face as a result of this rule.

Areas that EPA omitted from its economic cost evaluation that materially impact lime manufacturing plants subject to the rule in addition to the optimistic control effectiveness assumptions previously discussed include, but are not limited to, the following:

- There is no accounting for costs and time related to the research and development necessary to even attempt the application of EPA's candidate control technologies.
- For the small businesses lost opportunity costs are not incorporated into either the small business analysis or the total industry costs. For example, a large company could bring kilns down for a month at a site to install controls; and ship lime product from another plant. Small businesses would not have this luxury and would have to buy and ship product from a competitor.
- Many lime plants have physically constrained site layouts or particulate matter control device (PMCD) vent configurations that will require substantial engineering, design, and construction costs to comply with this rulemaking.
- EPA incorrectly assumes that existing venturi wet scrubbers in the lime industry are packed bed type scrubbers, thus underestimating costs to comply for scrubber equipped kilns necessary to control acid gases.
- There is a flawed presumption that use of ACI and DSI will not require improvements or upgrades to existing PMCDs on lime kilns.
- EPA inappropriately assumes that a single form of carbon can achieve reduction simultaneously for Hg, THC and D/F via ACI. This not only underestimates economic cost estimates but also undermines EPA's assertion that Beyond the Floor MACT limits can be achieved at no additional costs.
- Application of RTOs on a lime kiln in the economic model ignores the requirement to remove most of the SO<sub>2</sub> from the exhaust gas stream prior to the RTO (and related natural gas use and emissions) to avoid acid mist and visible emission formation in an RTO installation on a lime kiln.
- In order to install and operate the candidate controls, the need for new or upgraded utility infrastructure at lime plants (e.g., availability of natural gas, increased electric supply and transmission) has not been accounted for and can be very costly.

- Cost estimates included this rulemaking failed to account for dramatic and current inflationary effects. These could underestimate actual costs by 10% and likely more by the time compliance for existing sources is required.

Any one or more of these items, if properly accounted for in EPA's economic evaluation, would require significant increases in an appropriate cost estimate.

1.5. EPA's presentation of control strategies necessary to comply with this rule oversimplify the technical challenges that will need to be overcome.

Below we have identified the signification technical factors that make the candidate MACT technologies infeasible, either technically or economically, or indicate the level of R&D needed for the industry to attempt compliance with the Proposed Rule.

- Factors inhibiting HCl control effectiveness using DSI on lime kilns include, but are not limited to:
  - Many lime kilns may require redesign of ducting and/or relocation of the fabric filter (at great expense) to attempt to reach reasonable control efficiencies.
  - Injection of a sorbent will increase the inlet grain loading to fabric filter resulting in increased static pressure loss and potential compromise of compliance with the current Lime MACT PM standard. Therefore, replacement of fabric filter and/or addition of filter modules may be required resulting in increased costs above that estimated by EPA.<sup>56</sup>
  - A high calcium to HCl ratio is required.<sup>57</sup> This adsorption technique will have competition with SO<sub>2</sub> as it will also be incidentally captured increasing sorbent usage. Where SO<sub>2</sub> is present, this will increase operating cost which will compete with available free calcium to react with HCl.
  - Expected control efficiencies will likely be less than 90%, and will be lower at low inlet HCl concentrations, as opposed to the 98% presumed by EPA.<sup>58</sup>
- Factors inhibiting THC control effectiveness using RTO on lime kilns include, but are not limited to:
  - RTOs have not been installed on any lime kiln for THC or oHAP control.<sup>59</sup> The largest RTO installations commonly available are about 100,000 acfm, therefore multiple vessels with two chambers would be required for larger kiln systems to consider use of RTOs.
  - Sulfur dioxide in the kiln exhaust will need to be removed by a wet scrubber to prevent oxidation of SO<sub>2</sub> to SO<sub>3</sub> in the RTO combustion chamber and

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<sup>56</sup> Correspondence with Matt Devitt, LDX Corporation. 2023.

<sup>57</sup> Assessment of Dry Sorbent Emissions Control Technologies Part 1, Fundamental Processes, Muzio and Often, APCA. 1987.

<sup>58</sup> Basic Features of the Dry Absorption Process for Flue Gas Treatment Systems in Waste Incineration, Dr.-Ing. Rudi H. Karpf, (Germany), 2015.

<sup>59</sup> An RTO was installed on cement kiln in Midlothian, Texas at TXI to avoid Prevention of Significant Deterioration of Air Quality (PSD) permitting. It should be noted that TXI also incorporated a high efficiency sulfur dioxide scrubber before the RTO. 2003 IEEE-IAS/PCA Emissions Tutorial.



creating acid mist and visible emissions. In an RTO, SO<sub>3</sub> combines with water vapor at less than 500F forming sulfuric acid. At the RTO exit, and in the exhaust plume, the acid vapor reacts with water to form sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>\*2H<sub>2</sub>O) which is a PM<sub>2.5</sub> aerosol.

- RTO vendors typically guarantee an outlet THC concentration of about 30 ppm as carbon (C1) which is about 8.2 ppm as propane. The DRE for specific pollutant species is usually quoted at 95-98% using EPA Method 18. The proposed MACT THC concentration is lower than the THC levels guaranteed by commercial RTO designs. Therefore, even if an RTO were applied, obtaining a vendor guarantee at the level of the proposed THC limit may be impossible.
  - Regenerator operation is not a steady state but relies on cycling gas flows between at least two fixed packed beds, such that one is an inlet bed, and one is an outlet bed at any given point in system operation.<sup>60</sup> The THC testing duration is a 1-hour average concentration which includes multiple chamber changeover events (depending on operating temperature). During a changeover event, there is a spike in emissions as the poppet valve re-seats in the RTO. The spike can be a concentration that is multiple times higher than during steady state operation thus compromising the ability to demonstrate compliance with the proposed standard.
  - The normal maximum RTO operating temperature is between 1600 and 1700F. Given the need to scrub the exhaust gas to remove SO<sub>2</sub> before the RTO, a large amount of clean fossil fuel energy (e.g., natural gas) will be required to reach the RTO minimum operating temperatures.
  - As a result of combustion of natural gas, THC is expected to also be generated from the combustion chamber of the RTO, thus potentially compromising compliance with the proposed THC standard.
  - Greenhouse gases (CO<sub>2</sub> and CH<sub>4</sub>), NO<sub>x</sub> and CO will be generated by the RTO installation.
  - Many lime plants may have insufficient or unavailable supplies of natural gas to support the use of an RTO. This will require adding infrastructure at additional and substantial cost.
  - Destruction efficiency for RTO performance is based on chemical species being destroyed, not THC itself. Thus, it is unclear, and it may be kiln dependent, as to whether the MACT THC level is achievable by an RTO.
  - An RTO will also require additional power demand and infrastructure that may not be available at a given lime plant.
  - An RTO will require permitting.
- Factors inhibiting THC control effectiveness using ACI on lime kilns include, but are not limited to:
    - According to EPA's source document on THC control ACI, a supplier indicates capture to be 50-60% at gas temperature of 300-350F and as low as 10% at temperatures above 350F. Lime kilns operate at temperatures above

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<sup>60</sup> VOC Control Technology: Regenerative Oxidation. Pro-Environmental, Inc., 2009.

350F prior to the PMCD. Therefore, engineering studies would be required to define injection rates and removal efficiencies and would be kiln-specific depending on the oHAP profile.

- If exhaust quenching would be necessary, costs due to lost production would occur. A lime kiln relies on an induced draft (ID) from a fan that moves combustion air and CO<sub>2</sub> released from the decarbonization of limestone through its PMCD and ultimately the kiln's exhaust vent or stack. The ID fan is designed to meet the maximum air volume needed to meet nominal production from the kiln in terms of the expected gas characteristics (i.e., temperature, actual volume, gas composition, etc.). To achieve rapid gas cooling, methods generally include use of ambient air or water sprays to induce or promote adiabatic cooling over a short gas path length. Put more simply, rapid cooling of the exhaust gas stream results in larger loads on the ID fan that will consume any available ID fan capacity and force a reduction in process gas loading -- thus creating a process bottleneck meaning lower lime production rates from the kiln can occur than would otherwise be possible. This is another significant cost EPA failed to account for.
  - The influence of SO<sub>2</sub>, HCl, and Hg in the gas steam of a lime kiln will reduce the effectiveness for THC.
- *Factors inhibiting Hg control effectiveness using ACI on lime kilns include, but are not limited to:*
    - ACI control effectiveness decreases above 300 F to about 30%. If exhaust quenching would be necessary, costs due to lost production would occur. A lime kiln relies on an induced draft (ID) from a fan that moves combustion air and CO<sub>2</sub> release from the decarbonization of limestone through its PMCD and ultimately the kiln's exhaust vent or stack. The ID fan is designed to meet the maximum air volume needed to meet normal production from the kiln in terms of the expected gas characteristics (i.e., temperature, actual volume, etc.). To achieve rapid gas cooling, methods generally include use of ambient air or water sprays to induce or promote adiabatic cooling over a short gas path length. Put more simply, rapid cooling of the exhaust gas stream results in large actual gas volume increases that will consume any availability capacity in the ID fan that cannot be used to make lime – thus creating a process bottleneck again resulting in lower production rates from the kiln than the kiln would otherwise be able to produce.
    - The absorption mechanisms differ between the elemental or oxidized form of mercury. Each kiln would need to be studied for the form(s) of mercury in the exhaust to determine potential control alternatives. Activated carbon can be used for capture of the elemental form of mercury whereas brominated carbon is used for capture of ionic form. Brominated carbons are significantly more expensive.
    - Water vapor above 50% relative humidity and the presence of SO<sub>2</sub> in the gas stream reduces control effectiveness by 50% percent or more requiring a higher injection rate.

- Factors inhibiting D/F control effectiveness using ACI on lime kilns including, but not limited to:
  - ACI has been demonstrated to be effective in capture of D/F at temperatures below 300 F but is less effective as temperatures exceed 350 F. Most preheater or rotary kiln flue gases are higher than 450 F.
  - Control effectiveness is influenced by the relative concentration of the congeners which may be present in the flue gas stream. In a lime kiln, formation of the D/F species is complex and is influenced by temperature profile, residence time at critical temperatures, presence of chloride ions and aromatic organics as precursors. A detailed program of stack testing would be needed for each application to define the ACI rate and required gas stream temperature for control to determine if ACI would be feasible.
  - In a study at a preheater/pre-calciner cement kiln, D/F removal between 55% and 91% with injection rates of between 1.1 and 5.08 lb/mm acfm was indicated.
  - Several studies at portland cement plants have shown that D/F can be reduced by control of flue gas temperature using rapid cooling to reduce the flue gas temperature using atomized water sprays. However, the MACT limit for cement kilns is roughly 10 times higher than the proposed limit for lime kilns, so it is unclear if such reductions would be sufficient to meet the lower lime D/F standard.

Overall, EPA's candidate control technologies identified as necessary for lime kilns to comply with the Proposed Rule will require significant research and development, pilot plant experimentation, and great expense (and uncertainty). Furthermore, their application to achieve the very low levels of HAP emissions from lime kilns is far from demonstrated in practice and may not be achievable for many lime kilns.

## Appendix B

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**To:** National Lime Association  
**From:** Mike Remsberg, PE and Susan Barnes – Trinity Consultants  
**Date:** February 17, 2023  
**RE:** Updated - Economic Implications of Candidate HAP Emissions Controls on Commercial Lime Kilns

Trinity Consultants (Trinity) prepared a preliminary economic impact assessment given the potential costs associated with the impending Lime MACT rule revisions last year (see Docket Item: EPA-HQ-OAR-2017-0015-0091).<sup>1</sup> The proposed Lime MACT Rule amendments were eventually promulgated on January 5, 2023. With a view of the proposed rule now available, Trinity has used our prior cost estimation study (based on an EPA economic analysis) and has updated the cost impacts on the industry in this memo.

Given the short amount of time available to assess the impacts of this rulemaking and time to comment on this proposed rule, it is necessary to leverage our prior work in this analysis. As there is no ready-made economic cost model available for pollution control on lime kilns, Trinity has relied on EPA's prior work for economic impacts from the Portland Cement Manufacturing MACT rule. Although the manufacture of cement and lime have some fundamental differences in what their products are and how they are made, a cement kiln's scale, exhaust gas characteristics, and nature are a better proxy for what a lime manufacturer would experience in terms of technical and economic challenges than other typical combustion sources. Furthermore, in this update we used EPA's information provided in the proposed rule docket to arrive at our results.

Below is a summary of the methodology applied to arrive our results in this assessment:

- ▶ First, we estimated the number of control devices by kiln process type starting with EPA docket item EPA-HQ-OAR-2017-0015-0134, Attachment 1.
- ▶ As NLA has otherwise commented on the rule, the following revisions were made to this docket spreadsheet:
  - Updated EPA's economic analysis spreadsheet for 83% HCl control with DSI and 30% THC removal with ACI.
  - Corrected the Carmeuse, Gary IN kilns to their proper process type SR (not PR).
  - Note, four kilns in EPA's database were not assigned a process type. For the purposes of this analysis, we have assumed they are PR kilns.

Making these revisions, we found the following breakdown of controls needed to comply with rulemaking by process types:

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<sup>1</sup> EPA Docket Item: EPA-HQ-OAR-2017-0015-0091. Economic Implications of Candidate HAP Emissions Controls on Commercial Lime Kilns. Mike Remsberg, PE and Susan Barnes, Trinity Consultants, January 13, 2022.

Control Device	Estimated Number of Kilns Requiring Control Using EPA's Model			
	Preheater Rotary Kilns	Vertical Kilns	Straight Rotary Kilns	Kilns with No ICR Data
Wet Packed Tower Gas Absorbers	34	3	0	4
Dry Sorbent Injection	5	1	4	0
Activated Carbon Injection	34	4	35	4
Regenerative Thermal Oxidizer	36	4	3	4

From this point, we used the estimated total capital investment (TCI) and total annualized costs (TAC) from Trinity's original cost estimate study which provides economic impacts by kiln type and control technology.<sup>2</sup> To arrive at industry wide impacts, we summarized the costs for all 96 kilns identified in EPA's database that are potentially subject to this rule.

Control Device	Estimated Total Capital Investment per Kiln <sup>2</sup>			
	Preheater Rotary Kilns	Vertical Kilns	Straight Rotary Kilns	Kilns with No ICR Data <sup>3</sup>
Wet Packed Tower Gas Absorbers	\$ 12,526,457	\$ 11,203,000	\$ 13,494,397	\$ 12,526,457
Dry Sorbent Injection	\$ 583,058	\$ 74,283	\$ 589,476	\$ 583,058
Activated Carbon Injection	\$ 583,058	\$ 74,283	\$ 589,476	\$ 583,058
Regenerative Thermal Oxidizer	\$ 7,808,169	\$ 6,983,213	\$ 8,411,519	\$ 7,808,169
<i>All Kilns</i>	<i>\$ 729,732,884</i>	<i>\$ 61,913,267</i>	<i>\$ 48,224,121</i>	<i>\$ 83,670,736</i>

Total Capital Investment for All Kilns Affected by Proposed Rule: **\$ 924M**

Control Device	Estimated Total Annualized Costs per Kiln <sup>2</sup>			
	Preheater Rotary Kilns	Vertical Kilns	Straight Rotary Kilns	Kilns with No ICR Data <sup>3</sup>
Wet Packed Tower Gas Absorbers	\$ 1,596,758	\$ 1,437,765	\$ 1,745,214	\$ 1,596,758
Dry Sorbent Injection	\$ 677,760	\$ 184,644	\$ 678,571	\$ 677,760
Activated Carbon Injection	\$ 566,977	\$ 410,688	\$ 585,789	\$ 566,977
Regenerative Thermal Oxidizer	\$ 1,393,226	\$ 1,249,138	\$ 1,500,499	\$ 1,393,226
<i>All Kilns</i>	<i>\$ 127,111,926</i>	<i>\$ 11,137,243</i>	<i>\$ 27,718,396</i>	<i>\$ 14,227,844</i>

Total Annualized Costs for All Kilns Affected by Proposed Rule: **\$ 180M**

Our update reiterates our prior findings that the costs to the industry are very high given the design and scope of the proposed rule. We estimate that TCI will be in the order \$924M for existing LMPs to comply with the proposed rule and TAC will be in the range of \$180M per year for existing LMPs to comply with proposed rule. This further supports that EPA's economic impact analysis in this rulemaking far underestimates the impacts the proposed rule will have on major source LMPs.

<sup>2</sup> See Page 7. EPA Docket Item: EPA-HQ-OAR-2017-0015-0091.

<sup>3</sup> Kilns not identified with a process type in EPA's database are all presumed to be PR kilns.