Accordingly, even for technologies that theoretically exist and could potentially be installed at lime plants, the standard of unavailability in section 112(i)(4) is met due to the short time frame for compliance, and the two-year exemption is necessary.

3. EPA's Rulemaking Standard Does Not Establish That Standards in the Lime Rule Are Achievable with Available Technology

As noted above, EPA imposed standards requiring use of multiple control technologies, despite the fact that none of these technologies were in use at any U.S. lime plant as EPA developed its rule. This means that the efficacy of these technologies in actual lime plants is speculative, and will need significant testing and piloting before compliance can be assured, and in some cases there is serious doubt about whether compliance is possible at all. The record is thus insufficient to demonstrate that these technologies are available to implement the standards. Issues specific to the four HAPs are outlined below.

Dioxins/Furans (D/F)

The extremely low standard set by EPA for D/F was based on a single test, because the agency rejected other available test results for technical reasons. EPA also rejected NLA's assertion that additional data would be needed to set a valid standard. The standard—based on a multiple of the extremely low detection limit for D/F—will be very difficult for lime plants to meet consistently with any existing technology, and some plants believe that it will be impossible to guarantee compliance because the generation of D/F at very low levels can vary significantly. EPA set the D/F standard at the lowest level its policies allow such a standard to be set. EPA rejected NLA's requests for a reasonable work practice standard or for an alternative compliance method.

Activated Carbon Injection (ACI) was identified by EPA as the technology to control D/F emissions. There are numerous known challenges to using ACI to control D/F in lime kilns, especially with the extremely low limits set in the standard. Notably, no current lime kiln is using ACI technology to control D/F, so there will be additional challenges that will appear.

ACI is known to exhibit reduced effectiveness at temperatures above 350 degrees F. Most lime kilns operate at temperatures higher than 450 degrees F. To address this issue, cooling of kiln gases would be required, with unpredictable effects (although it is expected that this cooling would place additional strain on the kiln system and reduce lime production). In addition, cooling kiln gases to reduce D/F emissions may complicate addressing other HAP standards.

D/F control effectiveness is also influenced by the relative concentration of the type of D/F 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, lengthy and costly program of stack testing would be needed for each lime kiln to define the ACI rate and required gas stream temperature for control to determine if ACI would be feasible. Also, the extremely low concentrations of D/F known to be present in lime kiln exhaust gas makes effective ACI control even more challenging and problematic.