

US EPA ARCHIVE DOCUMENT

FACT SHEET

FINAL AMENDMENTS TO NATIONAL AIR TOXICS EMISSION STANDARDS AND NEW SOURCE PERFORMANCE STANDARDS FOR PORTLAND CEMENT MANUFACTURING

ACTION

- On August 6, 2010, EPA issued amendments to two rules that will significantly reduce emissions of mercury and other air toxics and particle-forming pollutants from new and existing Portland cement kilns across the United States. The rules also will limit emissions of ozone- and particle-forming pollutants from new kilns.
- EPA's amended *air toxics standards* will reduce air emissions of mercury, total hydrocarbons, hydrochloric acid and particulate matter from both new and existing cement kilns. The rules apply both to large and small kilns that emit toxic air pollutants. Air toxics, also known as hazardous air pollutants, are known or suspected to cause cancer or other serious health effects. Portland cement manufacturing is the third-largest source of mercury air emissions in the U.S.
- The Agency's amended *new source performance standards* will reduce nitrogen oxides (NO_x), sulfur dioxide (SO₂) and particulate matter from new kilns. NO_x and SO₂ both are harmful to health, and they react in the air to form other harmful pollutants. NO_x contributes to the formation of ground-level ozone and fine particle pollution, two of the pollutants most commonly found across the U.S. SO₂ contributes to fine particle pollution.
- The combined benefits of the two rules significantly outweigh costs, yielding an estimated \$7 to \$19 in public health benefits for every dollar in costs.
- Portland cement manufacturing is an energy-intensive process that grinds and heats a mixture of raw materials such as limestone, clay, sand and iron ore in a rotary kiln. That product, called clinker, is cooled, ground and then mixed with a small amount of gypsum to produce concrete. Pollutants are emitted from the burning of fuels and heating of the raw materials. Emissions also can occur from the grinding, cooling and materials-handling steps in the manufacturing process.
- A projected 181 Portland cement kilns will be operating at approximately 100 facilities in the United States in the year 2013. The amended air toxics requirements will apply to 158 of those kilns. The remaining kilns are subject to a separate regulation, for kilns that burn hazardous waste. About seven kilns will be subject to the new source performance standards.
- EPA estimates the following annual emission reductions when the rules are implemented in 2013:

- Mercury: 16,600 pounds, a 92 percent reduction from projected 2013 emission levels
 - Total hydrocarbons: 10,600 tons, a reduction of 83 percent;
 - Particulate matter: 11,500 tons, a 92 percent reduction;
 - Acid gases (measured as hydrochloric acid): 5,800 tons, a 97 percent reduction;
 - Sulfur dioxide (SO₂): 110,000 tons, a 78 percent reduction; and
 - Nitrogen oxides (NO_x): 6,600 tons, a reduction of 5 percent.
- Another EPA model estimates reductions in some pollutants that would be slightly less.

WHAT THE AMENDED RULES WILL REQUIRE

Air Toxics Standards (National Emissions Standards for Hazardous Air Pollutants)

- Under the Clean Air Act, EPA must set industry-based standards for 187 air toxics, also called hazardous air pollutants. These standards apply to both new and existing sources.
- Today's amended rule sets emission limits for mercury, total hydrocarbons and particulate matter that apply both to kilns that are major sources of air toxics and to kilns that are area sources. The rule also sets a hydrochloric acid limit (to reduce acid gases) for major source kilns only.
- A "major source" of air toxics emits 10 or more tons a year of a single air toxic pollutant, or 25 or more tons of a combination of air toxics. Sources emitting lesser amounts are known as "area sources."
- The emissions limits include:

Pollutant	Existing Source Kilns	New Source Kilns
Mercury	55 pounds per million tons of clinker, averaged over 30 days	21 pounds per million tons of clinker, averaged over 30 days
Total Hydrocarbons	24 parts per million by volume (ppmv), averaged over 30 days	24 ppmv, averaged over 30 days
Particulate Matter (as a surrogate for toxic metals other than mercury)	0.04 pounds per ton of clinker, averaged over 30 days	0.01 pounds per ton of clinker, averaged over 30 days
Hydrochloric acid (major sources only)	3 ppmv, averaged over 30 days	3 ppmv, averaged over 30 days

- Existing kilns must comply with the new limits three years after the final rule is published in the *Federal Register*. This deadline will occur in 2013. New kilns (those

built after May 6, 2009) must comply at startup or within 60 days after this rule was published, whichever is later.

- The amended rule removes a ban on the use of fly ash from utility boilers beginning in 2013 (the compliance date for the air toxics standards). Previous rules banned the use of fly ash from utility boilers if the mercury content of that fly ash had increased as a result of certain utility mercury emission controls, such as activated carbon injection. The amendments address emissions from fly ash through the mercury emission limits.
- EPA also is requiring continuous emissions monitoring for mercury, total hydrocarbons, particulate matter, and, in some cases, hydrochloric acid.
 - As part of today's rule, EPA is issuing methods and criteria for installing and certifying the accuracy of continuous emission monitoring systems for mercury.
 - The particulate matter monitoring requirement replaces existing opacity (visual evaluation) standards with a more accurate means of demonstrating compliance with particulate matter emissions limits.

New Source Performance Standards

- The Clean Air Act requires EPA to set new source performance standards (NSPS) for industrial categories that cause, or significantly contribute to, air pollution that may endanger public health or welfare. Cement kilns emit NO_x and SO₂, which are harmful to health and which react in the air to form other harmful pollutants. Kilns also emit particulate matter.
- Today's amended new source performance standards (NSPS) will apply to all cement kilns built after June 16, 2008. Those standards set emissions limits for nitrogen oxides (NO_x), sulfur dioxide (SO₂) and particulate matter. The limits for particulate matter are the same as the new source limits under the air toxics standard.

- The NSPS emission limits are:

New Source Performance Standards	
Pollutant	Emission Limits
NO _x	1.5 lb/ton clinker, averaged over 30 days
SO ₂	0.4 lb/ton clinker, averaged over 30 days
Particulate Matter	0.01 pounds per ton of clinker, averaged over 30 days

- EPA is requiring continuous emissions monitoring each of the three pollutants covered under this rule.
- Kilns must comply with the new source performance standards within 60 days of publication of the rule in the *Federal Register*, or at startup, whichever is later.

BENEFITS AND COSTS

- The public health benefits of the two rules are expected to significantly outweigh costs.
- EPA estimates benefits of these rules will range from \$6.7 billion to \$18 billion annually in 2013, as a result of reductions in fine particle pollution (PM_{2.5}). This includes the value of avoiding 960 to 2,500 premature deaths in people with heart disease. EPA estimates this rule also will prevent other serious health effects each year, including:
 - 17,000 cases of aggravated asthma,
 - 1,500 heart attacks,
 - 650 cases of chronic bronchitis,
 - 1,000 emergency room visits for respiratory problems, such as asthma,
 - 740 hospital admissions for respiratory or cardiovascular problems,
 - 32,000 cases of upper and lower respiratory symptoms,
 - 130,000 days when people miss work, and
 - 750,000 days when people must restrict their activities because of particle pollution-related symptoms.
- Today's air toxics rule also is expected to reduce the amount of mercury that deposits to land and water by up to 30 percent in some areas of the western United States, and 17 percent in some areas of the East. Computer models show that the biggest reductions generally occur near the cement kilns.
- Once mercury from the air reaches water, microorganisms can change it into

methylmercury, a highly toxic form that builds up in fish. Methylmercury exposure is a particular concern for women of childbearing age, unborn babies, and young children, because studies have linked high levels of methylmercury to damage to the developing nervous system. This damage can impair children's ability to think and learn.

- EPA conducted two analyses to estimate costs of implementing the new standards. An analysis estimating the costs of installing and operating pollution controls and indirect social costs at \$926 million to \$950 million annually in 2013. Another analysis, which includes only the costs of installing and operating controls, estimates costs will be lower, at \$350 million annually in 2013.

BACKGROUND

- EPA issued air toxics standards for Portland cement manufacturing in June 1999. That rule established emissions limits for particulate matter as a surrogate for certain metals, dioxins and furans, and set a total hydrocarbon limit for new kilns (those constructed after March 24, 1998). It did not include limits on total hydrocarbon for existing sources, or for acid gases and mercury for new or existing sources.
- Several organizations filed petitions for judicial review of that rule. On Dec. 15, 2000, the U.S. Court of Appeals for the D.C. Circuit remanded parts of the 1999 air toxics standards. The Court instructed EPA to set standards for hydrochloric acid, mercury, total hydrocarbons and metal hazardous air pollutants.
- In response to the remand, EPA amended the air toxics standards for Portland cement kilns in December 2006. The amendments set emissions limits for mercury and total hydrocarbons for cement kilns built after Dec. 2, 2005. The amendments also required that existing kilns meet "work practice" standards for mercury and hydrocarbon emissions. The final rule also adopted a standard for new and existing sources banning the use of utility boiler fly ash in cement kilns where the fly ash mercury content has been increased through the use of activated carbon or any other sorbent. The 2006 amendments did not set limits on hydrogen chloride emissions from cement kilns.
- In a separate action Dec. 8, 2006, EPA announced that it would reconsider the emission limits for mercury and total hydrocarbons for new cement kilns. Today's action responds to that reconsideration.
- Before the Dec. 8, 2006 reconsideration, the cement industry, environmental groups and states sued the Agency on the final amendments. The litigation was stayed by court order pending EPA's completion of today's rules. EPA also received petitions to reconsider the existing-source standards for mercury and total hydrocarbons, and the decision not to regulate hydrochloric acid. EPA granted those petitions, and today's final amendments serve as a response.

FOR MORE INFORMATION

- To download a copy the final rule, go to EPA's Worldwide Web site at <http://www.epa.gov/ttn/oarpg/ramain.html>
- Information about previous rules is available at <http://www.epa.gov/ttn/atw/pcem/pcempg.html>.
- For technical information about the rules, contact Keith Barnett of EPA's Office of Air Quality Planning and Standards at (919) 541-5605 or barnett.keith@epa.gov.