

Air Quality Case Study

Portland cement manufacturing plant

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O K L A H O M A
DEPARTMENT OF ENVIRONMENTAL QUALITY

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The Facility:

A wet process
portland cement
manufacturing
plant

Located in Ada
Oklahoma



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- The facility produces Portland cement.
- Materials are calcined at temperatures of 2500F to 3000F in a rotary kiln to produce "clinker". The facility has two kilns.
- The clinker is then finely ground and mixed with other materials (primarily gypsum) to produce cement.



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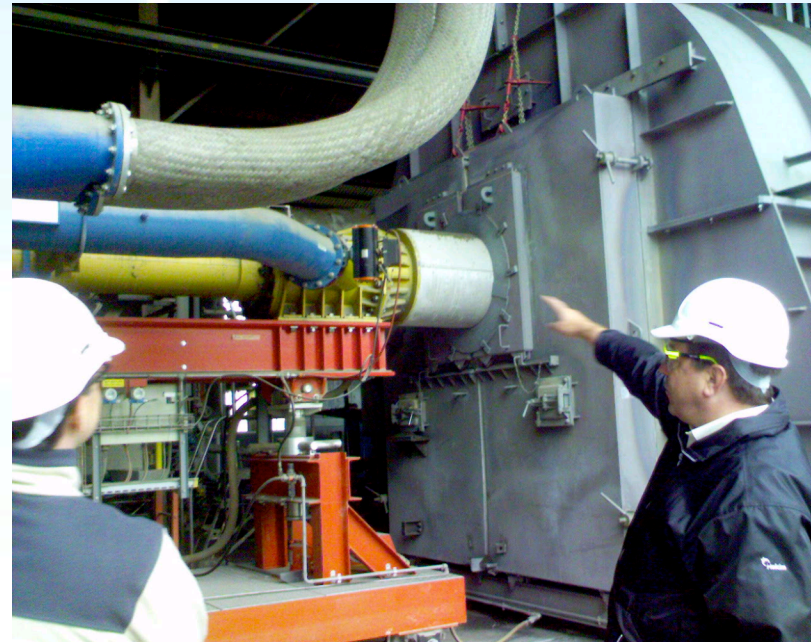
In addition to other fuels, the facility combusts whole tires to account for up to 18% of the total input heat required.



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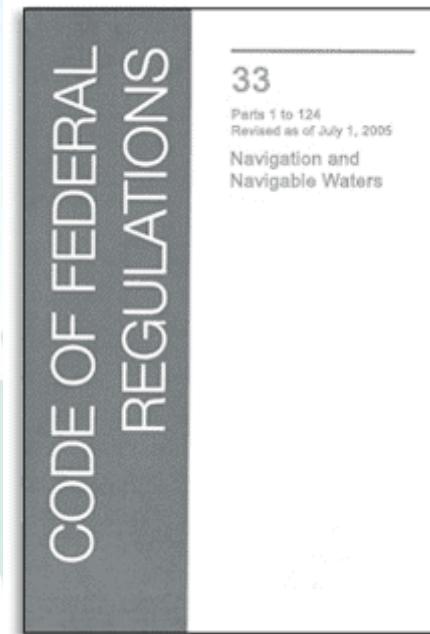
- Between November 19-21, 2002, DEQ Air Quality Division personnel conducted an evaluation of the facility, assisted by Region 6 of the U.S. Environmental Protection Agency. On January 28, 2003, a follow-up evaluation was conducted.



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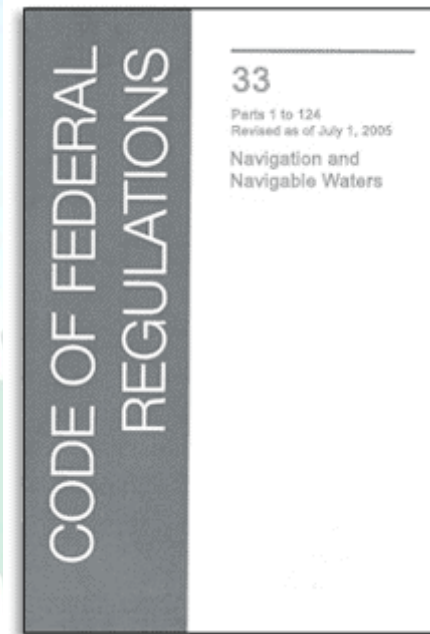
- The facility is subject to NSPS Subpart Y – Standards of Performance for Coal Preparation Plants, 40 CFR §§ 60.250-.254 (2002); and



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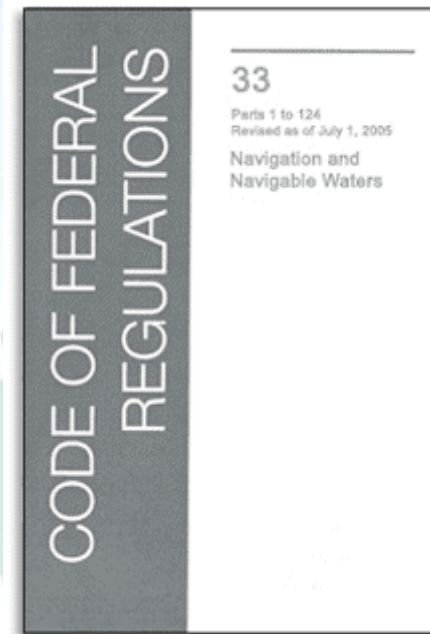
- NSPS General Provisions found at 40 CFR §§ 60.1-.19. Through June 13, 2002, components of the facility were also subject to Subpart F – Standards of Performance for Portland Cement Plants, 40 CFR §§ 60.60-.66 (2002).



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- The facility is also subject to NESHAP Subpart-LLL- National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry (“PC-MACT”), 40 C.F.R. §§ 63.1340-.1359 (2002).



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- 40 CFR Part 63 Subpart LLL, § 63.1343
Standards for kilns and in-line kiln/raw mills, states in part the following:
 - *Existing, reconstructed, or new brownfield/major sources.*
No owner or operator of an existing, reconstructed or new brownfield kiln or an existing, reconstructed or new brownfield in-line kiln/raw mill at a facility that is a major source subject to the provisions of this subpart shall cause to be discharged into the atmosphere from these affected sources, any gases which.... ***Exhibit opacity greater than 20 percent.***

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- § 63.1350 Monitoring requirements, states in part the following:
 - The owner or operator of a kiln or in-line kiln/raw mill shall monitor opacity at each point where emissions are vented from these affected sources including alkali bypasses in accordance with paragraphs (c)(1) through (c)(3) of this section....To remain in compliance, the opacity must be maintained such that the 6-minute average opacity for any 6-minute block period does not exceed 20 percent. ***If the average opacity for any 6-minute block period exceeds 20 percent, this shall constitute a violation of the standard.***

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- During the evaluation, it was discovered that from June 14, 2002 to April 7, 2003, the facility operated above 20 percent opacity for a total of 6092 minutes, or 1015 violations of a six-minute opacity standard.



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Other PC MACT violations
found:

failed to comply with §
63.6(e)(3)(iii) by failing to
maintain records or a
“checklist” that confirm
conformance with the
startup, shutdown, and
malfunction plan.



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- failed to comply with § 63.6(e)(3)(iii) by failing to maintain records or a “checklist” that confirm conformance with the startup, shutdown, and malfunction plan.



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- failed to comply with § **63.9(g)(1)** by failing to provide the required 60-day notification that they were conducting a performance evaluation on the COMS installed on the clinker coolers in June 2002.

The background features a stylized landscape illustration. On the left, there is a green windmill on a wooden tower. In the center, there are green reeds or grasses. On the right, there are several green trees on a small island or mound. At the bottom, there is a light blue body of water. The entire scene is set against a light blue background with large, faint, stylized letters 'A', 'E', and 'O' in the background.

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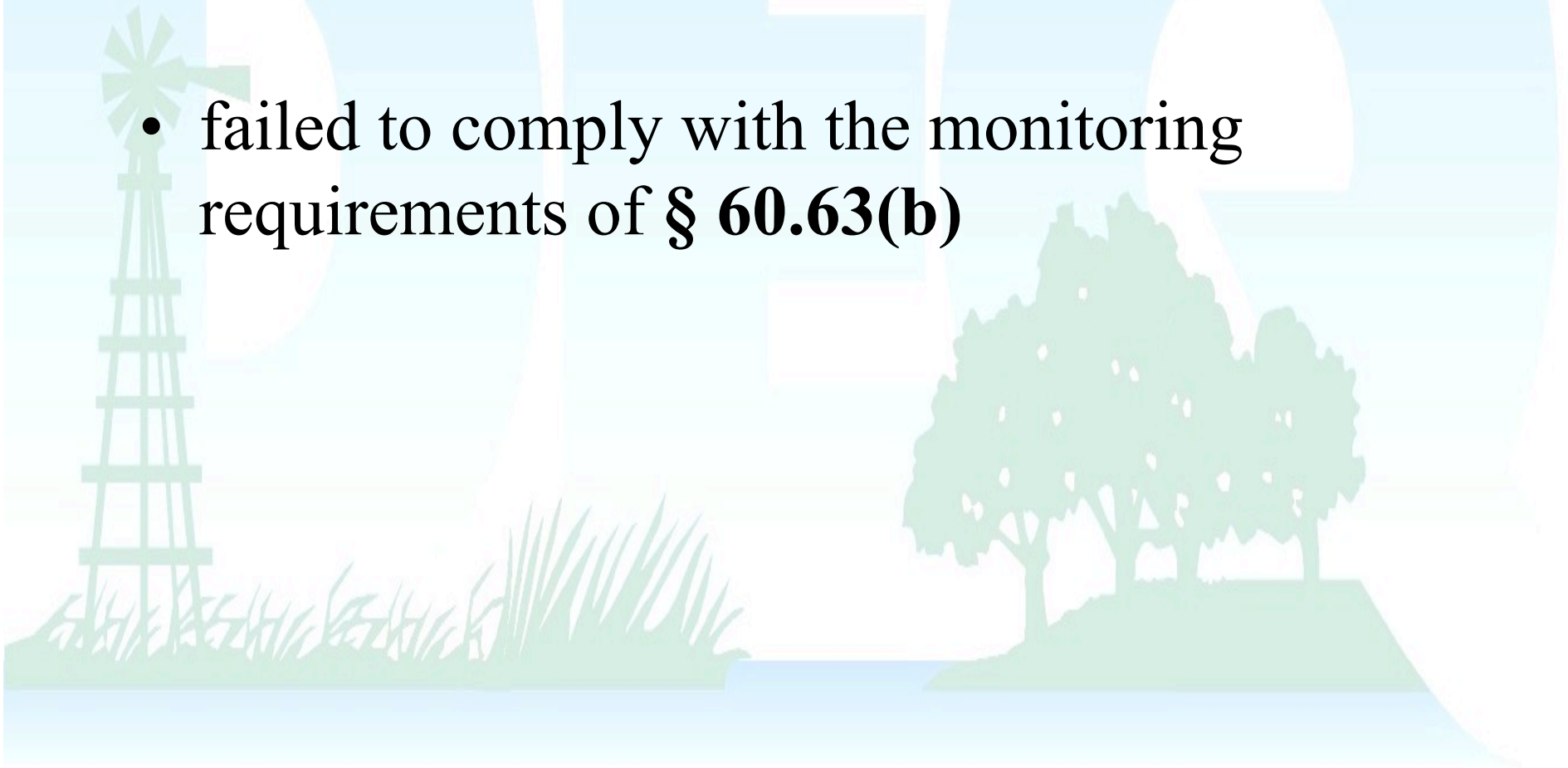
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- failed to comply with the temperature limit requirements of § **63.1344(a)**.

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- failed to comply with the monitoring requirements of § 60.63(b)



The background features a stylized illustration of a landscape. On the left, there is a green windmill with a multi-bladed fan. To the right of the windmill are several green trees of varying heights. The entire scene is set against a light blue background with large, semi-transparent arches that create a sense of depth and framing.

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- Previous noncompliance:
 - Respondent operated in noncompliance with § 63.1345 when performance testing demonstrated that the emissions from Clinker Cooler No. 2 exceeded the PM emission limit of 0.10 pounds per ton of feed (dry basis) to the kiln.



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- Matter referred to Air Quality Enforcement
- Several EPA HPV Criterion triggered.
- Notice of Violation Issued
 - \$321,000 penalty assessed
- Settlement negotiations began



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Company proposed an “Indirect Firing Project” as compliance measure.

- Facility originally used a “direct fire” process” that allowed minimal control of the combustion process.



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- “Indirect firing” allows for greater combustion control.
- Kiln burners were replaced with Low-NO_x designed burners.
- Bag filters added.
- Project Cost: \$ 4,108,700

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- Improved combustion control and efficiency.
- Decrease in Kiln downtime.
- Reduced dust generation.



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- Reduced particulate loading to the ESP.
- Reduced stack gas opacity.
- Reduced emissions of Carbon Monoxide.
- Reduction in CO emissions reduces ESP outages.
- Reduction in ESP outages will reduce occurrences of excessive opacity.



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- **Company also proposed 2 Supplemental Environmental Projects (SEPs):**
- Purchase and utilize at the facility a heavy-duty industrial vacuum loader truck. Cost \$ 226,000.
- Install and utilize an irrigation system to wet unpaved roads at the facility.
Cost \$ 45,000

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- Consent Order executed September 2005.
- Projects completed.

