ENVIRONMENTAL REGULATORY CONSIDERATIONS FOR SAWMILLS AND DRY KILNS

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Regulations

New Source Review

Federal program require air permit for new sources or modifications. Similar requirements exist from state to state, with variation in details

Prevention of Significant Deterioration (PSD)

Federal Program is setting tighter NSR permitting and compliance requirements for major sources. For sawmills, major is defined as 250 tons /yr of a criteria pollutant. These include particulates, VOCs, NO_x, CO, or SO_2.

Operating Permits (Title V)

Federal program instituted in 1990s requiring an "Operating Permit" that has to be renewed every 5 years. It includes annual fees based upon actual emissions

New Source Performance Standards (NSPS)
National Emission Standards for Hazardous Air Pollutants (NESHAPS)

These are federal programs defining process or equipment specific requirements. The relevant requirements for sawmills are:

- NSPS subpart Db (or similar) for Industrial, Commercial, and Institutional boilers
- NESHAPS DDDD for Plywood and Composite Wood Products for major sources of Hazardous Air Pollutants (HAPs) (>25 tons/yr of all EPA defined HAPs or 10 tons/yr of a single HAP facility-wide). This specifically includes dry kilns.
- NESHAPS DDDDD for Industrial, Commercial, and Institutional boilers and process heaters

Opacity Limits

These limits regulate particulate emissions indirectly by limiting how opaque an exhaust plume can be.

How Applicable Environmental Regulations are Implemented

In most jurisdictions, state or local regulatory agencies have programs that implement federal programs. Those programs vary a little with regard to criteria pollutants.

1. Typical differences include permit application process, emphases in controlling some types of emissions.

2. Dispersion modeling is typically required, at least for new sources, to estimate offsite impact due to emissions and wind patterns

3. Among criteria pollutants, the exception to modeling requirements is Volatile Organic Compounds (VOCs). VOCs is a general term; there is no (direct) offsite impact limit for VOCs. As a result, often less effort is made to study VOC emission factors.

The same can be said, probably even more so, for HAPs. State and local regulatory programs tend to very considerably in HAP requirements from one jurisdiction to another.

Opacity limits have potentially significant implications for wood / hog fueled boilers and sometimes fugitive particulate (dust) emissions. Opacity typically not an issue for a kiln unless it is burning.

NPDES water quality issues for "process water" similarly have limited implications for kilns, more significant implications elsewhere in the mill. Kiln condensate has turpenes, but small quantities and dry climate evaporation make the volumes small. Condensate should not be allowed to run directly into public waters. More significant process water issues can be associated with boiler blowdown, log watering systems, and potentially other mill processes.

Typical Air Pollutant Emissions Profile for Facilities with Lumber Dry Kilns

Lumber dry kiln emissions include primarily VOCs and HAPs. Applicable programs depend upon calculation of Potential to Emit (PTE). PTE can be limited by permit conditions to avoid tighter regulatory programs. Therefore, regulatory requirements for lumber dry kilns and facilities that include them are potentially significantly affected by VOC and HAP emission calculations and the emission factors that they are based upon.

State and local regulatory programs tend to vary significantly from jurisdiction to jurisdiction in their regulatory and permitting requirements and in precedents for accepting or using VOC and HAP emission factors. As previously noted, research funding for emission factor study is limited. Research shows VOC and HAP emission rates vary significantly with the species of wood, moisture content, climate or soil conditions where the tree grew, and drying temperature.

Generally, permit emission calculations for VOCs and HAPs vary emissions only by species. The variations by other parameters are challenging to include in a regulatory setting. A well supported proposal for emission factor variation with other parameters could conceivably help a facility avoid costly HAP major source or PSD requirements.

Wood or hog fueled boilers also tend to have significant emissions of criteria pollutants, VOCs, and HAPs. One or more large boiler(s) alone or with other facility operations can push the particulate and/or CO PSD threshold. Dry Kilns and boiler(s) will push the HAP major source threshold and potentially the VOC PSD threshold before 200MMbf.

Implications of Applicable Regulations for facilities with Lumber Dry Kilns

The Operating Permit program threshold of 100 tons / year of criteria pollutants. All but the smallest mills with wood / hog fueled boilers will be in the Title V Operating Permit program because the threshold is based upon the uncontrolled potential to emit (PTE). In some jurisdictions, there are local requirements to perform modeling for HAP emissions during NSR or Operating Permit review. There is also significant variation in the monitoring or emission control equipment required from jurisdiction to jurisdiction.

The PSD major source threshold for sources with criteria pollutants over 250 tons/yr could affect bigger saw and planer mills, typically not before 300MMbf/yr. The most significant emissions are typically from the boiler(s) first, kilns second, other sources of particulates next, unless the facility processes wood composites. Much tighter permitting requirements, tighter monitoring and impact requirements that have at least a six-figure cost.

NSPS Subpart Db Boiler Performance Standards sets emission limits for boilers based upon date boiler was installed.

NESHAPS DDDD applies to dry kilns at sources major for HAPs and sets emissions limits and testing requirements for dry kilns. It includes an option to minimize impact by preparing a risk assessment that should minimize impact for most dry kiln operations.

NESHAPS DDDDD (Boiler MACT) applying to boilers at sources major for HAPs. It reduces allowable emissions and requires much more extensive monitoring. The cost to implement these requirements is significant: $50K - $100K or more initially, plus ongoing costs >25K annually associated with required monitoring and tighter emission limits.

Beyond the Operating Permit requirement that affects most facilities with lumber dry kilns, this NESHAPS Boiler MACT requirement, triggered by exceeding the facility-wide major source threshold, is probably the next step up in regulatory compliance effort and cost a mill with kilns and a wood / hog fuel boiler has to deal with. The HAP major source threshold can seem like a moving target, because the emission factors used to calculate dry kiln HAP emissions are hard to find, and can potentially

change significantly as newer studies are performed and documented. Recent (Idaho) experience indicates that a NW facility with a wood / hog fueled boiler and dry kilns will start to push the HAP major source threshold at or before an annual dry kiln throughput of 200MMbf/yr, and will need a favorable species mix well before 250MMbf to stay below the HAP major source threshold.

As noted above, at what throughput the HAP major source threshold comes into play can potentially change as new kiln emission studies are prepared and reported. For these reasons, it can be very important to be aware of precedents for mill and HAP emissions in your regulatory jurisdiction, the regulatory jurisdiction's precedents for HAP emission factors from boilers and dry kilns, and the most recent studies that document dry kiln and/or boiler HAP emission factors that are accurate, representative of your operations, and hopefully supportive of your facility's business plan.