

APPROVING ALTERNATE BOILER FUELS IN AIR PERMITS



TYPES OF AIR POLLUTION SOURCES

- Major Source – emissions of one or more pollutants exceed a major source threshold
- Minor Source – emissions of all pollutants are below major source thresholds
- Synthetic Minor Source – emissions of one or more pollutants exceed a major source threshold, but facility requests operating limits and/ or emission limits to cap emissions below major source thresholds

TYPES OF AIR PERMITS

- Construction permits provide approval for construction, reconstruction, replacement, relocation or modification of an emission source. Conditions and requirements established in a construction permit are permanent and may only be revised through an appropriate construction permit action.
- Operation permits provide approval for ongoing operation of an emission source. Conditions and requirements established in an operation permit may be revised in an operation permit if the revision does not trigger the need for a construction permit.

TYPES OF OPERATION PERMITS

- Individual permit – detailed review of a single facility to create a permit with the applicable requirements for each significant emission unit at the facility
- General permit – generic permit issued to each facility in an industry sector with similar operations (asphalt plants for example)
- Registration permit – generic permit issued to individual facilities that meet certain criteria which include having emissions below a specific value

TYPICAL BOILER REQUIREMENTS

- Emission limitations for individual pollutants (particulate matter, carbon monoxide, etc.)
- Identify allowable fuels
- Use of air pollution control equipment (mechanical collector, baghouse, scrubber, electrostatic precipitator, etc.)
- Monitoring of air pollution control equipment operating parameters
- Recordkeeping of fuel usage and control equipment monitoring

TRADITIONAL BOILER FUELS

- Natural gas
- Propane / LP gas
- Fuel oil (distillate or residual)
- Coal
- Wood (including bark)
- Black liquor / red liquor

OTHER BOILER FUELS

- Petroleum coke
- Paper or paper pellets
- Shredded tires
- Resinated wood
- Paper recycling residuals
- Creosote treated railroad ties
- Other materials with adequate BTU content

CRITERIA FOR USE OF ALTERNATE FUELS

- The source has continuously had such design capability.
- The use will not cause or exacerbate the violation of an ambient air quality standard or ambient air increment.
- The use is not prohibited by any applicable permit, plan approval or special order.
- The use will not result in a violation of any emission limit in chapters NR 405, 408, 409, 415 to 436 and 445, Wis. Adm. Code.
- The use will not subject a source to any standard or regulation under section 112 of the Clean Air Act excluding section 112(d)(5) or (r).

PERMIT EXAMPLE #1

- A company has a medium sized industrial boiler that is allowed to burn natural gas, biogas, and #4 fuel oil as stated in their air permit
- The company asks if #2 fuel oil can be burned instead of #4 fuel oil
- May the company burn #2 fuel oil in the specified boiler based on the allowable fuels specified in their air permit?

PERMIT EXAMPLE #1 (CONTINUED)

- No - The company is not legally allowed to burn #2 fuel oil in the specified boiler because #2 fuel oil is not included in the list of allowable fuels in their air permit
- A permit revision is required to change #4 fuel oil to #2 fuel oil
- Since the allowable fuels in this case were specified in a construction permit, a construction permit revision would be required to make the change

PERMIT EXAMPLE #2

- An integrated pulp and paper mill has a medium sized recovery boiler that is allowed to burn black liquor, natural gas, and fuel oil as stated in their air permit
- The company previously burned #6 fuel oil in this boiler and asks if #2 fuel oil can be burned instead of #6 fuel oil
- May the company burn #2 fuel oil in the specified boiler based on the allowable fuels specified in their air permit?

PERMIT EXAMPLE #2 (CONTINUED)

- Yes - The company may burn #2 fuel oil in the specified boiler because the air permit stated fuel oil without specifying a particular grade or grades of fuel oil
- The construction permit review for this boiler used #6 fuel oil in the analysis and for the emission calculations, but the permit stated fuel oil
- Based on the of stating “fuel oil” as an allowable fuel, this boiler would technically be allowed to burn #1, #2, #4, #5 or #6 fuel oil

DEFINITIONS OF WOOD AND BIOMASS

- New Source Performance Standards (NSPS) for boilers – wood residue & wood
- Major Source Boiler NESHAP – biomass & clean dry biomass
- Area Source Boiler NESHAP – biomass
- 40 CFR Part 241 Subpart A (Solid Wastes used as Fuels or Ingredients in Combustion Units) – clean cellulosic biomass
- Neither wood nor biomass is defined in section 285.01, Wis. Stats. or section NR 400.02, Wis. Adm. Code

NSPS DEFINITIONS OF WOOD

- NSPS Subpart D – “Wood residue” means bark, sawdust, slabs, chips, shavings, mill trim, and other wood products derived from wood processing and forest management operations.
- NSPS Subpart Db - “Wood” means wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including, but not limited to sawdust, sander dust, wood chips, scraps, slabs, millings, shavings, and processed pellets made from wood or other forest residues.



PERMIT EXAMPLE #3

- Consider a large multi-fuel boiler that is allowed to burn wood and coal
- Permit states, “The permittee may burn wood and coal as primary fuels in this boiler.”
- The company requests permission to burn wood pellets
- Does the permit allow the company to burn wood pellets?
- The company later requests permission to burn wood pellets that contain various chemical additives that include high density polyethylene (HDPE)
- Does the permit allow the company to burn wood pellets with chemical additives?

PERMIT EXAMPLE #3 (CONTINUED)

- The permit would allow the company to burn wood pellets in this boiler because there are no chemical additives in the pellets and they would be considered another type of wood fuel
- Wood pellets with HDPE and other chemical additives would not be allowed to be burned because this would be considered an alternate fuel that is not allowed by the air permit as written to allow combustion of wood fuel
- A permit revision would be needed to add wood pellets with HDPE as an allowable fuel

PERMIT EXAMPLE #4

- Consider the same large multi-fuel boiler from Example #3 that now has a footnote in the permit stating, “Wood fuel is defined as wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including, but not limited to, sawdust, sander dust, wood chips, scraps, slabs, millings, shavings, and processed pellets made from wood or other forest residues.”
- The company requests permission to burn charcoal and wood oil
- Does the permit allow the company to burn charcoal and/ or wood oil?



PERMIT EXAMPLE #4 (CONTINUED)

- Both charcoal and wood oil would be allowed as alternate fuels provided they could be fed to the boiler using the existing fuel feed system(s) for the boiler
- Charcoal and wood oil are byproducts of specific manufacturing processes used in the wood products industry and include no chemical additives, thus both materials are considered derivative fuels obtained from virgin wood

FEDERAL RULES COVERING FUEL COMBUSTION

- New Source Performance Standards (NSPS) for Boilers
- Combustion sources at Pulp & Paper Mills NESHAP (40 CFR Part 63 Subpart MM)
- Major Source Boiler NESHAP (40 CFR Part 63 Subpart DDDDD or 5D)
- Area Source Boiler NESHAP (40 CFR Part 63 Subpart JJJJJ or 6J)
- NSPS for Commercial & Industrial Solid Waste Incinerators (CISWI)
- Solid Wastes used as Fuels or Ingredients in Combustion Units & Identification of Non-hazardous Secondary Materials (40 CFR Part 241 Subparts A & B)

NON-HAZARDOUS SECONDARY MATERIALS (NHSM)

- Scrap tires
- Resinated wood
- Coal refuse
- Dewatered pulp and paper sludge
- Construction and demolition (C&D) wood
- Paper recycling residuals
- Creosote treated railroad ties

ARE NHSM ALLOWABLE BOILER FUELS?

- The answer depends on the type of air permit held by a given facility and the wording of the permit with regard to allowable fuels for a specific boiler
- Some facilities had one or more of these materials included in their air permit prior to the development of the Non-Hazardous Secondary Materials Rule
- Some facilities could potentially burn one or more non-hazardous secondary materials if the criteria for alternate fuels are met
- Many facilities would need a permit revision to add one or more of the non-hazardous secondary materials as an allowable fuel

CONCLUSIONS AND QUESTIONS

- Determining whether a boiler can burn an alternate fuel can be complicated
- A revision to an air permit may be needed to allow combustion of an alternate fuel
- Look for ways to verify that construction and demolition wood can meet the definition of wood and not need to be viewed as an alternate fuel
- Questions