

Air Quality Issues Associated with Biodiesel Production Facilities



Factors to Consider When Planning to Construct or Expand a Biodiesel Facility

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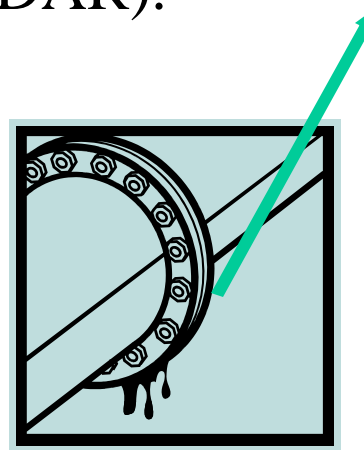
Air emissions consisting of odors, volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) can be released during the handling and storage of raw materials and products.



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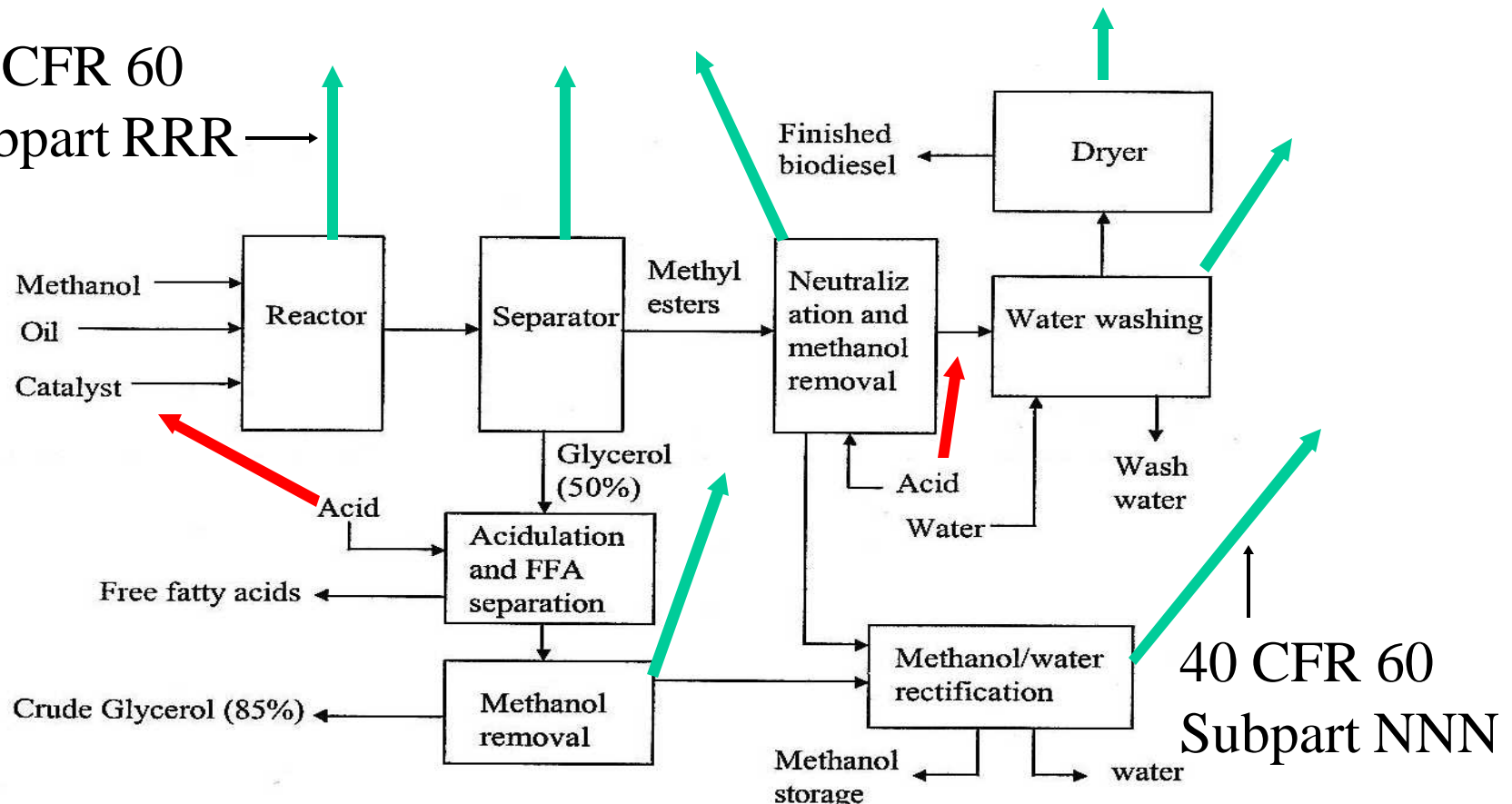
Biodiesel production technology is regulated under the federal New Sources Performance Standards (NSPS) because of the by-product production of glycerin. This means the biodiesel facilities are subject to leak detection and repair programs (LDAR).



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40 CFR 60

Subpart RRR



Methanol emissions must be tightly controlled. If soybean oil contains residual hexane, this will be an air emission concern. These are federally regulated hazardous air pollutants.



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Other operations at biodiesel facilities emit air pollutants as well.



Boilers



Emergency Generators



Cooling Towers



Fire Pumps



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- ❖ The quantity of a facility's annual air emissions drives permit and pollution control requirements
- ❖ Biodiesel production facilities are classified as:
 - ▶ Major Sources
 - ▶ Minor Sources
 - ▶ Synthetic Minor Sources

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- ❖ A biodiesel facility's source type is determined by its:
 - ◆ Location
 - **Attainment or Non-Attainment Areas**
 - ◆ Emissions of Criteria Air Pollutants
 - Fine Particulate, VOCs, CO, NO_x, SO₂
 - ◆ Emissions of Hazardous Air Pollutants
 - Methanol, Hexane, Hydrochloric Acid



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❖ For Air Emission Permit purposes:

- ▶ Major Sources in Attainment Areas are allowed to emit >100 tons per year (5 tons for Lead) of any Criteria Pollutant with pollution control equipment in use.
- ▶ Major Sources in Ozone Non-Attainment Areas are allowed to emit as little as 10 to more than 100 tons of VOCs per year. The **severity** of the Ozone problem in the area the plant is to be built defines what is a Major Source of VOCs.
- ▶ Major Sources of hazardous air pollutants (HAPs) are those that allowed to emit >10 tons per year of a single HAP or >25 tons per year of several HAPs, taking into account the use of pollution control equipment.



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- ❖ Major Sources of Criteria Pollutants in Attainment Areas must use **Best Available Control Technology** (BACT) to control of Attainment Criteria Pollutants.
- ❖ Major Sources of Criteria Pollutants in Non-Attainment Areas must use **Lowest Achievable Emission Rate** (LAER) Control Technology to control emissions of Non-Attainment Criteria Pollutants.
- ❖ Major Sources of HAPs must use **Maximum Achievable Control Technology** (MACT) to control emissions of HAPs such as methanol or hexane.
- ❖ Very large facilities may have BACT, MACT and LAER emissions control requirements on various pieces of production equipment.



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❖ Compliance Watch-outs

- ▶ Process emissions, tank emissions, equipment leaks, and transfer operations at their maximum equipment capacity must be included when calculating potential emissions.
- ▶ Fuel combustion for process heating must be evaluated.
- ▶ Leak Detection And Repair (LDAR) programs are required and detailed in nature.
- ▶ Risk Management Plans (40 CFR 68) may be required, especially if the facility is subject to OSHA's Process Safety Management rules.



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❖ Recommendations to Avoid Compliance Issues

- ▶ Involve technical and legal expertise early in your project planning.
- ▶ Make every effort to control the emissions of methanol and hexane to less than 10 tons per year each.
- ▶ Invest the effort in a well-prepared pre-application meeting with regulators.



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Best Wishes for a
Prosperous 2008!

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