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Air Quality Terminology

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Agriculture is in the spotlight as a potential contributor to air pollution. Animal feeding operations, or AFOs, cause special concern in regions of the United Sates with intensive livestock and poultry production systems. As a result, national ambient air quality standards are being strictly enforced at local, state and regional levels. Animal producers, technical service providers, and the general public should be familiar with the terminology used in the National Clean Air Act (CAA), the law that governs standards for protecting and improving ambient air quality and regulates industries that may emit air pollutants.

Clean Air Act — The law passed in 1970 (and subsequent amendments) that created federal air quality standards and established the Environmental Protection Agency as the lead federal agency protecting and improving the nation's air quality.

Criteria pollutant — One of six air pollutants that may adversely affect human health. These "criteria pollutants" are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead (Pb). EPA established maximum concentrations for these substances.

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EPA — The United States Environmental Protection Agency, created in 1970 by the Clean Air Act to set and enforce air quality standards and guide state regulatory agencies.

National Ambient Air Quality Standards (NAAQS) — Air quality standards set by the EPA for the criteria pollutants. Found in 40 CFR 50 (Title 40 of the Code of Federal Regulations, Part 50).

Non-attainment area — A geographic region that does not meet the NAAQS for one of the criteria pollutants.

Aerodynamic equivalent diameter (AED) — A term describing the settling velocity of different size particles in air compared to a particle of water.

Equivalent spherical diameter (ESD) — A term that categorizes the properties of irregularly shaped particles based on a correction to spherical shape. Particles with an ESD of 10 all behave as spherical particles of 10-micron diameter.

Micron — One millionth of a meter, sometimes referred to as a micro-meter or μm. This is the typical unit when referring to particle diameters.

Major source — A pollution source that emits 10 tons per year of any of the listed toxic air pollutants, or 25 tons per year of a mixture of pollutants. Major sources may release air pollutants when there are equipment leaks, when materials are transferred from one location to another, or when materials are discharged through emission stacks or vents.

Area source — A smaller facility that releases lesser quantities of toxic pollutants into the air (less than 10 tons per year of a single pollutant, or less than 25 tons per year of a combination of pollutants). Though emissions from individual area sources are often relatively small, collectively their emissions can be of concern, particularly where a large number of sources are located in heavily populated areas.

Mobile source — A source of pollution that is not stationary, such as a bus, automobile, airplane or train.

Point source — A single, identifiable, fixed source of pollution such as a stack, cyclone exhaust, facility or mine.

Fugitive emissions — Air pollutants that escape unplanned, as from equipment leaks, the bulk handling or processing of raw materials, windblown dust, natural airflow over area sources, and a number of other specific processes.

Best management practices (BMP) — Procedures or controls that can be implemented to prevent or reduce pollution.

Lowest achievable emission rate (LAER) — Under the Clean Air Act, the rate of emissions that reflects 1) the most stringent emission limitation in the implementation plan of any state for such source unless the owner or operator demonstrates such limitations are not achievable; or 2) the most stringent emission limitation achieved in practice, whichever is more stringent. A proposed new or modified source may not emit pollutants in excess of existing new source standards. LAER is accomplished by using the maximum achievable control technology (MACT).

Maximum achievable control technology (MACT) — The level of control associated with the lowest achievable emission rate (LAER). It is used for polluters in non-attainment areas of a regulated pollutant. There is generally no consideration for economic reasonableness for this level of control.

Best available control technology (BACT) — Abatement or treatment techniques based on the latest technology that have been proven under field conditions and that take cost into consideration.

Particle size distribution (PSD) — The range of particle sizes in a given air sample, typically expressed as a frequency function such as a lognormal curve.

Prevention of significant deterioration (PSD) — EPA program that requires state and/or federal permits in order to restrict emissions from new or modified sources in places where air quality already meets or exceeds primary and secondary ambient air quality standards.

Title V —The amendment to the Clean Air Act that establishes the federal operating permit program administered by the states.

Hazardous substance — Any substance designated by EPA for which releases of a designated quantity into the environment must be reported.

Hazardous air pollutants (HAPS) — In addition to the six criteria pollutants, 187 other air pollutants that are not covered by ambient air quality standards but that, as defined in the Clean Air Act, may reasonably be expected to cause or contribute to irreversible illness or death. Such pollutants include asbestos, beryllium, mercury, benzene, coke oven emissions, radionuclides and vinyl chloride.

References: United States Environmental Protection Agency.
Clean Air Act, Section 112.40; Code of Federal Regulations, Section 62.3.

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