

# **Glossary**

## **Acid Deposition**

"Acid rain" has come to be recognized as a major environmental problem. The precipitation of acidic water as rain, snow, and dew is related to air pollution because the sulfuric and nitric acids that contaminate atmospheric moisture are generated from the combustion of fossil fuels. Complex chemical changes take place when sulfur oxides (emitted from sources such as power plants) and nitrogen oxides are transported in the air many miles from their points of origin. Over a period of three to five days, the materials are converted to their acid forms and precipitated from the atmosphere.

## **Alternative Fuels**

Fuels that can replace ordinary gasoline or diesel fuels. Alternative fuels may have particularly desirable energy efficiency and pollution reduction features. Alternative fuels include compressed natural gas, alcohols, liquefied petroleum gas (LPG), synthetic diesel and electricity. The 1990 Clean Air Act encourages development and use of alternative fuels.

## **Air Contaminant**

Any discharge, release, or other propagation into the atmosphere which includes, but is not limited to, smoke, dust, soot, grime, carbon, fumes, gases, odors, particulate matter, acids, or any combination thereof.

## **AMBER® 363 Low Emissions Fuel**

A synthetic diesel fuel replacement formulated to comply with air quality regulations limiting nitrogen oxide (NOx), sulfur oxide (SOx) and ROG emissions from stationary sources such as industrial boilers, process heaters and generators. Amber 363 is a proprietary formula developed and supplied by Dion & Sons, Inc. utilizing feedstocks from Shell Oil Company. The fuel is a clear, bright combustible liquid with a mild odor. It is extremely low in sulfur, nitrogen and other contaminants which cause toxic emissions. Amber 363 meets ASTM and CARB Standards for No. 2 diesel fuel.

## **AQMD**

Air Quality Management District; the agencies responsible for preparing the portion of the State Implementation Plan (SIP) applicable within their boundaries; adoption of control regulations for stationary sources and implementation of indirect source and transportation control measures.

## **Best Available Control Technology (BACT)**

A term used to describe the technology used to control emissions from sources of air pollution. BACT changes as improvement in technology occurs.

## **Biodiesel**

An alternative liquid fuel for stationary, portable and mobile compression ignition engines that is manufactured from various feedstocks, including soy and waste restaurant grease & oil. The product can be used in pure form or it can be mixed with standard No. 2 diesel fuel. One common mixture, referred to as B20, includes a 20% biodiesel and 80% standard No. 2 diesel. The product reduces the carbonaceous fraction of diesel particulate matter through improved in-cylinder combustion which can be attributed primarily to biodiesel's high oxygen content. B20 biodiesel fuel reduces particulate emissions by an average of 18%. However, NO<sub>x</sub> emissions are slightly increased. B20 can be used without changes to existing diesel engines or the fuel distribution infrastructure. A biodiesel blend must meet the ASTM and CARB diesel specifications when used in motor vehicles.

## **CARB**

California Air Resources Board; the agency responsible for adopting motor vehicle emission standards; compiling the State Implementation Plan (SIP) for submission to the Environmental Protection Agency (EPA); approving district air quality plans as sufficient to meet state legal requirements; and general oversight of districts. CARB also has established state ambient air quality standards for criteria pollutants which are somewhat more stringent than the National Ambient Air Quality Standards (NAAQS).

## **Carbon Monoxide (CO)**

This is an odorless, invisible gas which affects the health of people exposed to high concentrations. Carbon monoxide is especially dangerous indoors, when ventilation is inadequate. A substantial amount carbon monoxide comes from motor vehicles. A substantial amount also comes from burning wood in fireplaces and woodstoves. State and federal controls on new cars and voluntary efforts to reduce wood burning have been implemented to prevent carbon monoxide from reaching adverse levels.

## **Catalytic Converter**

An engine exhaust device that reduces particulate matter (PM), carbon monoxide (CO) and hydrocarbon emissions from stationary and portable diesel engines through a catalytic oxidation process. Emissions reductions vary depending on the engine size and model, exhaust temperature and flow rate, duty cycle and condition of engine.

## **CFC's (Chlorofluorocarbons)**

These chemicals and some related chemicals have been used in great quantities in industry, for refrigeration and air conditioning, and in consumer products. CFCs and their relatives, when released into the air, rise into the *stratosphere*, a layer of the atmosphere high above the Earth. In the stratosphere, CFCs and their relatives take part in chemical reactions which result in reduction of the stratospheric *ozone* layer, which protects the Earth's surface from harmful effects of radiation from the sun. The 1990 *Clean Air Act* includes provisions for reducing releases (emissions) and eliminating production and use of these ozone-destroying chemicals.

## **Clean Air Act**

The original Clean Air Act was passed in 1963, but our national air pollution control program is actually based on the 1970 version of the law. The 1990 Clean Air Act Amendments are the most far-reaching revisions of the 1970 law. In this summary, we refer to the 1990 amendments as the 1990 Clean Air Act.

## **Combustion**

Many criteria air pollutants, such as sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and particulates (PM-10) are combustion products. They are often products of the burning of fuels such as coal, oil, gas and wood.

## **Continuous Emission Monitoring Systems (CEMS)**

Equipment monitors which measure, on a continuous basis, pollutants released by a source. The 1990 Clean Air Act requires continuous emission monitoring systems for certain large sources.

## **Control Technology (Control Measures)**

Equipment, processes or actions used to reduce air pollution. The extent of pollution reduction varies among technologies and measures. In general, control technologies and measures that do the best job of reducing pollution will be required in the areas with the worst pollution. For example, the best available control technology/best available control measures (BACT, BACM) will be required in serious non-attainment areas for particulates, a criteria air pollutant. A similar high level of pollution reduction will be achieved with maximum achievable control technology (MACT) which will be required for sources releasing hazardous air pollutants.

## **Criteria Air Pollutants**

A group of very common air pollutants regulated by EPA on the basis of criteria (information on health and/or environmental effects of pollution). Criteria air pollutants are widely distributed all over the country.

## **Construction Equipment**

Equipment that uses an engine and that is primarily used in construction and operated at commercial construction sites.

## **District**

See AQMD.

## **Emergency**

Any situation arising from sudden and reasonably unforeseen natural disaster such as earthquake, flood, fire, or other acts of God, or other unforeseen events beyond the control of the portable engine or equipment unit operator, its officers, employees, and contractors that threatens public health and safety and that requires the immediate temporary operation of portable engines or equipment units to help alleviate the threat to public health and safety.

## **Emission**

The release of pollutants into the air from a source. Sources emit pollutants. Continuous emission monitoring systems (CEMS) are machines, which some large sources are required to install, to make continuous measurements of pollutant release.

## **Enforcement**

The legal methods used to make polluters obey the Clean Air Act. Enforcement methods include citations of polluters for violations of the law (citations are much like traffic tickets), fines and even jail terms. The Federal EPA and the state and local governments are responsible for enforcement of the Clean Air Act, but if they don't enforce the law, members of the public can sue EPA or the states to get action. Citizens can also sue violating sources, apart from any action EPA or state or local governments have taken. The 1990 Clean Air Act gave EPA authority so that, in some cases, EPA can fine violators without going to court first. The purpose of this new authority is to speed up violating sources compliance with the law and reduce court time and cost.

## **Hazardous Air Pollutants (HAP's)**

Chemicals that cause serious health and environmental effects. Health effects include cancer, birth defects, nervous system problems and death due to massive accidental releases such as occurred at the pesticide plant in Bhopal, India. Hazardous air pollutants are released by sources such as chemical plants, dry cleaners, printing plants, and motor vehicles (cars, trucks, buses, etc.)

## **Engine**

Any piston-driven, internal combustion engine.

## **Environmental Protection Agency (EPA)**

## **Equivalent Replacement**

A substitution of one or more registered portable engine(s) or equipment unit(s) with a portable engine or equipment unit that is intended to perform the same or similar function as the original portable engine or equipment unit, and where the following conditions exist:

1. The replacement engine or equipment unit results in equal or lower air contaminant emissions than the existing engine or equipment unit (or sum of existing engines or equipment units) expressed as a mass per unit time (limitations on capacity or hours of operation shall not be taken into account in qualifying for lower air contaminant emissions);
2. The replacement engine or equipment unit meets the emission control technology requirements of this article contained in sections 2456 and 2457;
3. The rated brake horsepower of the replacement engine does not exceed the rated brake horsepower of the existing engine (or sum of existing engines) by more than 20 percent. For every percentage point increase of the rated brake horsepower, there shall be an associated decrease in emissions of nitrogen oxides, expressed as a mass per unit time, equal to or exceeding two percentage points;
4. The manufacturers maximum rated capacity of the replacement equipment unit does not exceed the maximum rated capacity of the existing equipment unit.

## **Farm Equipment**

Equipment that uses an engine and that is primarily used (as defined below) in the commercial production and or commercial harvesting of food, fiber, wood, or commercial organic products or in the processing of such products for further use on a farm.

## **Federal Clean Air Act**

The original 1970 Clean Air Act detailed requirements of attainment of NAAQS for criteria air pollutants, i.e. pollutants causing human health impacts due to their release from numerous sources. The following criteria pollutants have been identified: ozone, particulate matter (PM<sub>10</sub>), carbon monoxide (CO), lead, nitrogen dioxide (Nox) and sulfur dioxide (SO<sub>2</sub>). The 1970 Act required attainment by 1975. The Act was amended in 1977 and again in 1990 to extend the attainment deadlines. Current deadlines vary by pollutant and severity of pollution in the region. The latest deadline is the year 2010 for extreme ozone non-attainment areas. (The South Coast District in Los Angeles, CA is the only such area.)

## **Hydrogen Sulfide (H<sub>2</sub>S)**

A colorless gas with a strong "rotten egg" odor, hydrogen sulfide (H<sub>2</sub>S) can be smelled at very low concentrations. It discolors paints and tarnishes many metals. This gas is produced largely at sewage treatment plants and at oil refineries as a by-product in refining crude oil. Concentrations of H<sub>2</sub>S are limited by District regulations.

## **INTERNAL COMBUSTION ENGINE (ICE)**

Any engine which uses fuel for combustion to produce power. This includes spark-ignited, compression ignition and turbine engines.

## **Low NOx Diesel Fuel**

See Amber® 363 low emissions fuel.

## **Material Safety Data Sheets (MSDS)**

Product safety information sheets prepared by manufacturers and marketers of products containing toxic chemicals. These sheets can be obtained by requesting them from the manufacturer or marketer. Some retail stores, such as hardware stores, may have material safety data sheets on hand for products they sell.

## **Mobile Off-Highway (MOH)**

U.S. Environmental Protection Agency (EPA) term used to describe non-road, mobile sources of air pollution. This includes off-road construction equipment, portable equipment such as pumps, welders, woodchippers, power generators, dredges, compressors, rock crushers and concrete batch plants.

## **Mobile Sources**

Moving objects that release pollution; mobile sources include cars, trucks, buses, planes, trains, motorcycles and gasoline-powered lawn mowers. Mobile sources are divided into two groups:

1. road vehicles, which includes cars, trucks and buses and,

2. non-road vehicles, which includes trains, planes and lawn mowers.

## **National Ambient Air Quality Standards (NAAQS)**

The Federal Clean Air Act standard for criteria air pollutants, i.e. pollutants causing human health impacts.

## **Nitrogen Oxides (NO<sub>x</sub>)**

Air is comprised of about 80 percent nitrogen. Whenever anything burns at high enough temperatures a certain amount of nitrogen in the air burns as well. Burning, also known as oxidation, occurs when material combines with oxygen in such a way as to release energy in the form of light and heat. The resulting compounds containing nitrogen are primarily nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>). Mixtures of these two compounds are known as oxides of nitrogen and they are involved in photochemical reactions that produce ozone. At higher concentrations, nitrogen dioxide can be seen as a brown haze. On days with otherwise good visibility, the coloration effects will be noticeable. At higher concentrations, damage has been noticed in sensitive crops such as beans and tomatoes, and pulmonary changes have been observed in laboratory animals. The Environmental Protection Agency (EPA), California's Air Resources Board (CARB) and the AQMD have all adopted measures to curtail emissions of nitrogen oxides. AQMD directly controls power plants, boilers, stationary turbines, and stationary engines that are sources of these pollutants, and indirectly controls vehicular sources of NO<sub>x</sub> by working to change people's driving habits.

## **Non-Road Engine**

Except as discussed in paragraph (2) of this definition, a non-road engine is any engine:

1. In or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers); or in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or that, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.
2. An engine is not a non-road engine if the engine is used to propel a motor vehicle or a vehicle used solely for competition, or is subject to standards promulgated under section 202 of the federal Clean Air Act; or the engine is regulated by a federal New Source Performance Standard promulgated under section 111 of the federal Clean Air Act; or the engine otherwise included in paragraph (1)(C) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (at least two years) and that operates at that single location approximately three (or more) months each year.

## **Offset**

A method used in the 1990 Clean Air Act to give companies which own or operate large (major) sources in non-attainment areas flexibility in meeting overall pollution reduction requirements when changing production processes. If the owner or operator of the source wishes to increase release of a criteria air pollutant, an offset (reduction of a somewhat greater amount of the same pollutant) must be obtained either at the same plant or by purchasing offsets from another company.

## **Oxygenated Fuel (Oxyfuel)**

A special type of gasoline, which burns more completely than regular gasoline in cold start conditions; more complete burning results in reduced production of carbon monoxide, a criteria air pollutant. In some parts of the country, carbon monoxide release from cars starting up in cold weather makes a major contribution to pollution. In these areas, gasoline refiners must market oxygenated fuels, which contain higher oxygen content than regular gasoline. Some gasoline companies started selling oxyfuels in cities with carbon monoxide problems before the 1990 Clean Air Act was passed.

## **Ozone**

A gas which is a variety of oxygen. The oxygen gas found in the air consists of two oxygen atoms stuck together; this is molecular oxygen. Ozone consists of three oxygen atoms stuck together into an ozone molecule. Ozone occurs in nature; it produces the sharp smell you notice near a lightning strike. High concentrations of ozone gas are found in a layer of the atmosphere, the stratosphere, high above the Earth. Stratospheric ozone shields the Earth against harmful rays from the sun, particularly ultraviolet B. Smog's main component is ozone. This ground-level ozone is a product of reactions among chemicals produced by burning coal, gasoline and other fuels, and chemicals found in products including solvents, paints, hairsprays, etc.

## **Ozone Hole**

A thin place in the ozone layer located in the stratosphere high above the Earth. Stratospheric ozone thinning has been linked to destruction of stratospheric ozone by CFCs and related chemicals. The 1990 Clean Air Act has provisions to reduce and eliminate ozone destroying chemicals' production and use. Ozone holes have been found above Antarctica and above Canada and northern parts of the United States, as well as above northern Europe.

## **Oxidation Catalyst**

See Catalytic Converter.

## **Particulate Matter (PM10)**

Dust, mist, ash, smoke and fumes are some of the liquid or solid particles found in the atmosphere. In many parts of the world, natural particles like dust and pollens are the principal source of air pollution; in industrialized regions, particulate emissions caused by human activities predominate. Smoke, composed of carbon and other products of incomplete combustion, is the most obvious form of particulate pollution. Open fires, incinerators, petroleum refining, and fuel burning in vehicles and aircraft all produce these highly visible particulates. Industrial processes such as those used in refining crude oil and in manufacturing chemicals also contribute to particulate formation.

Liquid aerosols and solid particles form photo-chemically in the atmosphere when sunlight reacts with waste gases. When metals are melted, the heated material emits fumes which may condense to form metallic oxides in the atmosphere. Industrial dust is formed by grinding or pulverizing materials, as in cement production. Earth-moving operations, especially farming and construction, also cause large amounts of dust to enter into the air. Some particulate emissions are considered more toxic than others. Highly toxic substances such as cadmium, beryllium, and asbestos are associated with specific industries and are of greatest concern in the immediate vicinity of the source.

### **Particulate Filter or Particulate Trap**

An engine exhaust device that reduces particulate matter (PM), carbon monoxide (CO) and hydrocarbon emissions from stationary and portable diesel engines through a catalytic oxidation and filtration process. The passive, self-regenerating catalyzed filter system collects particulate matter and oxidizes it under normal engine exhaust temperatures. The integrated catalyst reduces the particulate oxidation temperature and oxidizes soluble organic carbon monoxide and hydrocarbon emissions. Emissions reductions vary depending on the engine size and model, exhaust temperature and flow rate, duty cycle and condition of engine.

### **Permit**

The 1990 Clean Air Act introduced a nationwide permit system for air pollution control. A document that resembles a license, is required for most sources of air pollution. Usually, permits will be given out by states, and most states require every piece of equipment which emits or controls air pollution to have a permit to operate from the local AQMD. The 1990 Clean Air Act includes requirements for permit applications, including provisions for members of the public to participate in state and EPA reviews of permit applications. Permits will have, in one place, information on all the regulated pollutants at a source. Permits include information on which pollutants are being released, how much the source is allowed to release, and the program that will be used to meet pollutant release requirements. Permits are required both for the operation of plants (operating permits) and for the construction of new plants (permit to construct). To ensure compliance, it is a good idea to check with the local AQMD.

### **Permit**

A document resembling a license, required by the CAA for sources of air pollution, such as power plants, chemical factories. Usually permits will be given out by states, represented by Districts or AQMD's. Permits include information on which pollutants are being released, how much the source is allowed to release, and the program that will be used to meet pollutant release requirements. Permits are required both for the operation of plants (called permits to operate) and for the construction of new plants (called permits to construct).

### **Photochemical SMOG – Ozone**

Photochemical air pollution, or photochemical smog results from a chemical reaction which takes place in the atmosphere between NO<sub>2</sub> and reactive organic gases under the photochemical influence of sunlight. Various factors affect this process, including the quantity of gases present, the volume of air available for dilution, the temperature, and the intensity of the ultraviolet light. Ideal conditions occur in the summer and early fall on warm, windless, sunny days. The major effects of photochemical smog are aggravation of respiratory diseases, eye irritation, visibility reduction and vegetation

damage. The largest fraction of photochemical smog is ozone. The greatest source of smog-producing gases is the automobile.

## **Portable**

Designed and capable of being carried or moved from one location to another. Indicia of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. For the purposes of this regulation, dredge engines on a boat or barge are considered portable. The engine or equipment unit is not portable if any of the following are true:

1. The engine or equipment unit or its replacement is attached to a foundation, or if not so attached, will reside at the same location for more than 12 consecutive months. Any engine or equipment unit such as back-up or stand-by engines or equipment units, that replace engine(s) or equipment unit(s) at a location, and is intended to perform the same or similar function as the engine(s) or equipment unit(s) being replaced, will be included in calculating the consecutive time period. In that case, the cumulative time of all engine(s) or equipment unit(s), including the time between the removal of the original engine(s) or equipment unit(s) and installation of the replacement engine(s) or equipment unit(s), will be counted toward the consecutive time period; or
2. The engine or equipment unit remains or will reside at a location for less than 12 consecutive months if the engine or equipment unit is located at a seasonal source and operates during the full annual operating period of the seasonal source, where a seasonal source is a stationary source that remains in a single location on a permanent basis (at least two years) and that operates at that single location at least three months each year; or the engine or equipment unit is moved from one location to another in an attempt to circumvent the portable residence time requirements. [Note: The period during which the engine or equipment unit is maintained at a storage facility shall be excluded from the residency time determination.

## **Portable Registration**

Issuance of a certificate by the CARB Executive Officer acknowledging expected compliance With the applicable requirements of this article, and the intent by the owner or operator to operate said portable engine or equipment unit within the requirements established by this article as it pertains to portable engines and equipment units.

**Rental Business** means a business in which the principal use of its engines or equipment units is to temporarily rent or lease for profit, portable engines or equipment units to operators other than the owner(s) of the engine or equipment unit. Renter means a person who rents a portable engine or equipment unit from a rental business.

## **Resident Engine**

1. A portable engine that at the time of applying for registration, has a current, valid district permit or registration issued in accordance with local district requirements and an application for registration is submitted to the Executive Officer before July 1, 2001; or
2. A portable engine that resided in the State of California at any time during calendar year 1995 and an application for registration is submitted to the Executive Officer no later than July 1, 2000; or

3. A portable engine where registration becomes mandatory pursuant to section 2451 (d) of this article.

### **Selective Catalytic Reduction (SCR)**

A widely used process for the reduction of nitrogen oxides (NO<sub>x</sub>) in flue gases and exhaust gases. NO<sub>x</sub> emission reductions of over 80-90% are achieved by injecting a reducing agent (in the form of anhydrous ammonia, aqueous ammonia or an aqueous solution of urea) into the exhaust gas at a temperature of 300° - 400°C. Subsequently the ammonia/exhaust gas mixture pass through a precious metal catalyst, where the nitrogen oxides are converted to nitrogen and water vapor. The conversion of nitrogen oxides does not create any secondary pollution as the products formed are only nitrogen and water vapor, which are already present in the atmosphere in large amounts.

### **SMOG**

A mixture of pollutants, principally ground-level ozone, produced by chemical reactions in the air involving smog-forming chemicals. A major portion of smog-formers come from burning of petroleum-based fuels such as gasoline and diesel. Smog can harm health, damage the environment and cause poor visibility. Major smog occurrences are often linked to heavy motor vehicle traffic, sunshine, high temperatures and calm winds - creating a temperature inversion - weather condition in which warm air is trapped close to the ground instead of rising.

### **SOURCE**

Any place or object from which pollutants are released. A source can be a power plant, factory, dry cleaning business, gas station or farm. Cars, trucks and other motor vehicles are sources, and consumer products and machines used in industry can be sources too. Sources that stay in one place are referred to as stationary sources; sources that move around, such as cars, portable equipment or planes, are called mobile sources. (Refer to Mobile Source and Stationary Source)

### **State Implementation Plan (SIP)**

The part of the Federal Clean Air Act that requires each state to develop a state implementation plan to attain the NAAQS by the applicable attainment deadlines. SIP's must be approved by the Federal EPA as containing sufficient measures to timely attain NAAQS and meet other requirements. Once approved by the EPA, SIP requirements can be enforced against regulated sources by EPA and by any U.S. citizen.

### **Stationary Source**

Any building, structure, facility or installation which emits any affected pollutant directly or as a fugitive emission. A Building, A Structure, A Facility, or A Installation, includes all pollutant emitting activities which:

1. Are under the same ownership or operation, or which are owned or operated by entities which are under common control;
2. Belong to the same industrial grouping either by virtue of falling within the same two-digit standard industrial classification code or by virtue of being part of a common industrial process, manufacturing process, or connected process involving a common raw material; and are located on one or more contiguous or adjacent properties.

**Sulfur Oxides (SO<sub>2</sub>)**

Heating and burning "fossil fuels," like coal and oil, release the sulfur present in these materials. In areas where large quantities of fossil fuels are used, sulfur oxides can be a major air pollution problem. The largest fraction of sulfur oxides is sulfur dioxide (SO<sub>2</sub>). This substance often further oxidizes to form sulfur trioxide (SO<sub>3</sub>), which in the presence of moisture can form sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>). These contaminants can damage vegetation and affect the health of both humans and animals.

**Transportable**

See Portable.

**Volatile Organic Compound (VOC)**

Organic gases, or hydrocarbons, are released when fuels or organic waste materials are burned. These materials are the result of incomplete combustion and range in complexity from methane, a simple organic gas, to much more complex molecules containing carbon, hydrogen and oxygen in varying proportions. Organic compounds are also emitted by consumer products such as aerosol sprays and by paints, inks, solvents and gasoline when they evaporate. Organic compounds are significant air pollutants because they react with oxides of nitrogen in the presence of sunlight to produce photochemical smog, or ozone.