

Glossary of Clean Air Act Terms



Acid rain -- Air pollution produced when acid chemicals are incorporated into rain, snow, fog or mist. The "acid" in acid rain comes from sulfur oxides (SO₂) and nitrogen oxides (NO_x), products of burning coal and other fuels and from certain industrial processes. SO₂ and NO_x are related to the strong acids: sulfuric acid and nitric acid, respectively. Once SO₂ and NO_x are released, winds blow them far from their source. If these acid chemicals are blown into wet-weather areas, they can fall to Earth in the rain, snow, fog or mist. If they are blown to dry-weather areas, the acid chemicals may become incorporated into dusts or smokes. Acid rain can damage the environment, human health and property.

Add-on controls -- Post-combustion control devices that reduce the amount of unburned *volatile organic chemicals (VOC)* or other compounds emitted to the atmosphere. Add-on controls can also reduce the percentage of particulate matter, generated by combustion process, emitted to the atmosphere.

Air Toxics -- See *Toxic air contaminants*.

Attainment area -- A geographic area in which levels of a *criteria air pollutant* meet the health-based primary standard (national ambient air quality standard, or *NAAQS*) for the pollutant. An area may have an acceptable level for one criteria air pollutant, but may have unacceptable levels for others. Thus, an area could be both attainment and nonattainment at the same time. Attainment areas are defined using federal pollutant limits set by EPA.

Best Available Control Technology for Toxics (T-BACT) -- The technology available to best remove *toxics* from emissions. It is based on achieving the greatest reduction for each pollutant. When making the decision the following are taken into account: energy, environmental impact and economic impact.

Bin Vent Filter -- Used on Minergy storage silos to minimize emission of *particulate matter*.

British Thermal Unit (BTU) -- A measure of the amount of energy produced from a material that is being combusted.

Carbon monoxide (CO) -- A colorless, odorless, poisonous gas, produced by incomplete burning of carbon-based fuels including gasoline, oil and wood. Carbon monoxide is also produced from incomplete combustion of many natural and synthetic products.

This is a publication of the Technical Outreach Services for Communities (TOSC) Program at Michigan State University. TOSC provides technical assistance and educational services to communities with air pollution problems and polluted sites. For more information, contact Kirk Riley, TOSC Program Coordinator, at (800) 490-3890, or see www.egr.msu.edu/tosc.

Carcinogen -- A cancer-causing agent.

Clean Air Act (CAA) -- The comprehensive federal law, which regulates air emissions. The goal of the law was to develop national ambient air quality standard (*NAAQS*) that protect public health and the environment. The original CAA 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, in large part, were intended to deal with previously unaddressed or under-addressed problems such as *acid rain*, ground level *ozone*, ozone depletion and *air toxics*.

Clean fuels -- Low-pollution fuels that can replace ordinary gasoline. These are alternative fuels, including gasohol (gasoline-alcohol mixtures), natural gas and LPG (liquefied petroleum gas).

Combustion -- Burning accompanied by release of energy in the form of heat and light. Refers to controlled burning of waste, in which heat chemically alters *organic* compounds, converting into stable *inorganics* such as carbon dioxide and water. Many important pollutants, such as sulfur dioxide, nitrogen oxides, and particulates (*PM-10*) are combustion products, often products of the burning of fuels such as coal, oil, gas and wood.

Concentration -- The relative amount of a substance mixed with another substance. An example is five parts per million of carbon monoxide in air or 1 milligram/liter of iron in water.

Contaminants -- Toxic or hazardous substances in soil, water or air that may increase health risks, depending on likelihood of exposure and toxicity. Cadmium, dioxin, TCE, benzene, and carbon tetrachloride are examples of contaminants.

Continuous emission monitoring systems (CEMS) -- Machines that measure, on a continuous basis, how much pollution is being released into the air. For specific locations or stacks, CEMS measure the pollutants released (emitted) by that *source* into the air. EPA requires that CEMS monitor sulfur dioxide (SO_2), flow, nitrogen oxides (NO_x) and *opacity*. Continuous emission monitoring systems will measure, on a continuous basis.

Continuous Opacity Monitoring systems (COMS) -- Equipment used to sample and condition, analyze and provide permanent record of emissions or process parameters that reduce the transmission of light and obscure the view of a background object.

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 *nonattainment 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. EPA has identified and set standards to protect human health and welfare for six pollutants: ozone, carbon

monoxide, total suspended particulates, sulfur dioxide (SO₂), lead, and nitrogen oxide (NO_x). It is on the basis of these criteria that standards are set or revised.

Cyclone Furnace -- The type of furnace used in the Minergy Clear Horizons process. It is where the wastewater sludge (and coal and limestone flux) is combusted to form the glass aggregate.

Disposal -- The final placement or destruction of toxic, radioactive or other wastes. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, ocean dumping, or incineration.

Dry scrubbing -- The removal of sulfur dioxide (SO₂) and toxics by using lime and minimal amounts of water to provide humidification.

Emission -- Release of pollutants into the air from a source. Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities; from residential chimneys; and from motor vehicle, locomotive, or aircraft exhausts.

Emission Standard -- The maximum amount of air polluting discharge legally allowed from a single source, mobile or stationary.

Emissions Trading -- The creation of surplus emission reductions at certain stacks, vents or similar emissions sources and the use of this surplus to meet or redefine pollution requirements applicable to other emissions sources. This allows one source to increase emissions when another source reduces them, maintaining an overall constant emission level. Facilities that reduce emissions substantially may "bank" their "credits" or sell them to other facilities or industries.

Enforcement -- Legal methods used to make polluters obey the *Clean Air Act*. It can also include legal actions taken by EPA, state, or local regulators to obtain compliance with environmental laws, rules, regulations, or agreements and/or obtain penalties or criminal sanctions for violations. Enforcement methods include citations of polluters for violations of the law (citations are much like traffic tickets), fines and even jail terms. 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.

Exceedance -- Violation of the pollutant levels permitted by environmental protection standards.

Exposure -- Radiation or pollutants that come into contact with the body and present a potential health threat. The most common routes of exposure are through the skin, mouth or by inhalation.

Exposure pathway -- Route of contaminants from the source of contamination to potential contact with a "receptor" (any living organism, including humans). For example gasoline leaking from an Underground Storage Tank to surrounding soil is an exposure pathway.

Fabric filter (baghouse) -- A cloth device that catches dust particles from industrial emissions.

Glass Aggregate -- An *inert* material used in applications such as road construction, roofing shingles, and landscaping materials. It is prepared by fusing the minerals contained in wastewater solids in a furnace and rapidly quenching (cooling) the molten material.

Grandfathering -- A term used to describe an exemption from an Air Use Permit for equipment that meets two requirements: 1) installed prior to the passage of Michigan Air Quality Rule 201 in August 15, 1967, and 2) has never been modified.

Hazardous air pollutants (HAPs) -- Air pollutants that are not covered by ambient air quality standards but which, as defined in the *Clean Air Act*, may present a threat of adverse impact to human health and the environment. Such pollutants include asbestos, beryllium, mercury, benzene, coke oven emissions, radio nuclides, and vinyl chloride. HAPs are released by sources such as chemical plants, dry cleaners, printing plants, and motor vehicles (cars, trucks, buses, etc.).

Hazardous substance -- Any material that poses a threat to public health or the environment. Typical hazardous wastes are toxic, corrosive, ignitable, explosive, or chemically reactive. Petroleum, crude oil, natural gas, natural gas liquids or synthetic gas usable for fuel are not considered hazardous substances.

Heavy metal -- A group of toxic metals including arsenic, chromium, copper, lead, mercury, silver, and zinc.

Hydrocarbon -- An organic compound containing only carbon and hydrogen and often found occurring in petroleum, natural gas and coal.

Incineration -- A treatment technology involving destruction of waste by controlled burning at high temperatures; e.g., burning sludge to remove the water and reduce the remaining residues to a safe, non-burnable ash that can be disposed of safely on land, in some waters, or in underground locations. The reduction of material mass and volume through combustion.

Inert -- Innocuous, undamaging, nontoxic. Something that is not detrimental to health or the environment.

Inhalable Particles -- All dust capable of entering the human respiratory tract.

Initial risk screening level (IRSL) -- A Michigan health based level for a *carcinogenic* effect that is defined as an increased cancer risk of one in one million (i.e., 'ten to the minus six' or 10^{-6}). This applies only to new or modified source subject to the permit application. It is designed to be protective for carcinogenic effects.

Initial threshold screening level (ITSL) -- A Michigan health-based screening level designed to be protective for non-carcinogenic effects (an illness that threatens health but is not cancer). It is based on toxicological data. It is a value for a compound that was determined from the recommended exposure level established by toxicologists at various government offices

Inorganic -- A substance that contains ingredients other than only carbon and hydrogen. Metals, rocks, and asbestos are inorganic substances.

Interstate air pollution -- In many areas, two or more states share the same air. We say these states are in the same air basin defined by geography and wind patterns. Often, air pollution moves out of the state in which it is produced into another state. Some pollutants, such as the power plant combustion products that cause acid rain, may travel over several states before affecting health, the environment and property. The 1990 Clean Air Act includes many provisions, such as interstate compacts, to help states work together to protect the air they share. Reducing interstate air pollution is very important since many Americans live and work in areas where more than one state is part of a single metropolitan area.

Landfill -- A land disposal site for nonhazardous solid wastes.

Leach -- The process by which substances are released from the soil by dissolving in fluids, usually rain and surface water, and are carried down through the soil. To pass through the soil due to rain or groundwater moving through contaminated materials. Leaching can cause hazardous substances to enter the soil, surface water, or groundwater.

Lead -- A heavy metal monitored as one of the seven pollutants for the NAAQS standards set for air pollution controls. A heavy metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds has been sharply restricted or eliminated by federal laws and regulations. (See: heavy metals.)

Limestone Flux -- The addition of calcium chloride (limestone) to the combustion process to reduce the formation of acid rain contaminants (SO_2 and NO_x , also see *acid rain*).

Lowest Achievable Emission Rate (LAER) -- Under the *Clean Air Act*, the rate of emissions that reflects (1) the most stringent emission limitation in a *state implementation plan (SIP)* for a source unless the owner or operator demonstrates such limitations are not achievable; or (2) the most stringent emissions 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.

Low NOx Burners -- One of several combustion technologies used to reduce emissions of Nitrogen Oxides (NO_x).

Major Stationary Sources -- Term used to determine the applicability of *Prevention of Significant Deterioration (PSD)* and new source regulations. In a *nonattainment area*, any stationary pollutant source with potential to emit more than 100 tons per year is considered a major stationary source. In PSD areas the cutoff level may be either 100 or 250 tons, depending upon the source.

Material safety data sheets (MSDS) -- The 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 stores, such as hardware stores, may have material safety data sheets on hand for products they sell.

Maximum Achievable/Available Control Technology (MACT) -- Technology based standards for reducing emissions of these hazardous air pollutants. The emission standard for sources of air pollution requiring the maximum reduction of hazardous emissions, taking cost and feasibility into account. Under the Clean Air Act Amendments of 1990, the MACT must not be less than the average emission level achieved by controls on the best performing 12 percent of existing sources, by category of industrial and utility sources.

Medium -- Air, water or soil that is the subject of regulatory concern and activities.

Mobile sources -- Any non-stationary source of air pollution. Mobile sources include cars, trucks, buses, planes, trains, motorcycles and gasoline-powered lawn mowers. Mobile sources are divided into two groups: road vehicles, which include cars, trucks and buses, and non-road vehicles, which include trains, planes and lawn mowers.

Monitoring (monitor) -- With respect to monitoring the air, monitoring means periodic or continuous observation or testing to determine the level of compliance with legal requirements and/or pollutant levels in the air. EPA, state and local agencies measure the types and amounts of pollutants in community air. The 1990 Clean Air Act requires certain large polluters to perform enhanced monitoring to provide an accurate picture of their pollutant releases. Enhanced monitoring programs may include keeping records on materials used by the source, periodic inspections, and installation of *continuous emission monitoring systems (CEMS)*. The 1990 Clean Air Act requires states to monitor community air in polluted areas to check on whether the areas are being cleaned up according to schedules set out in the law.

Micrograms/liter (μl) -- Measure of the concentration of chemicals in fluids. Roughly equivalent to “parts per billion” or ppb.

Milligrams/liter (mg/l) -- Measure of the concentration of chemicals in fluids. Roughly equivalent to “parts per million” or ppm.

Mobility -- Ability of contaminants to move. A highly mobile contaminant will spread quickly.

Monitoring -- Periodic or continuous surveillance or testing to determine the level of compliance with federal, state or local regulations or to assess pollutant levels in various media, or in humans, animals and other living things.

National Ambient Air Quality Standards (NAAQS) -- Standards established by EPA that apply for outdoor air throughout the country. (Also see: criteria pollutants, state implementation plans, emissions trading.) NAAQS define the maximum permissible concentrations for certain pollutants. These pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, lead, ozone, and particulate matter with diameters less than ten microns.

National Emissions Standards for Hazardous Air Pollutants (NESHAPS) -- Emissions standards set by EPA for an air pollutant not covered by NAAQS that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness. Primary standards are designed to protect human health, secondary standards to protect public welfare (e.g., building facades, visibility, crops, and domestic animals).

National Pollutant Discharge Elimination System (NPDES) -- The primary permitting program under the Clean Water Act (CWA), which regulates all discharges to surface water. It prohibits discharge of pollutants into waters of the U.S. unless EPA, a state, or a tribal government issues a special permit to do so.

Negative Pressure (Indoor-Outdoor Pressure Differential)(DP) -- The use of airflow equipment, including the operation of exhaust fans or ceiling fans, to create an indoor-outdoor pressure differential (DP) on a building. As the result of this pressure differential (i.e., negative pressure) on the building, outdoor air moves into the building, and the air inside the building does not flow outdoors. This negative pressure will insure that the flow of vapors and air contaminants will stay inside the building. The building type, design, materials, and workmanship (relative to the tightness of the construction) also influence building pressures.

New Source -- Any stationary source built or modified after publication of final or proposed regulations that prescribe a given standard of performance.

New Source Performance Standards (NSPS) -- Uniform national EPA air emission and water effluent standards which limit the amount of pollution allowed from new sources or from modified existing sources.

New Source Review (NSR) -- A *Clean Air Act* requirement that *State Implementation Plans* must include a permit review that applies to the construction and operation of new and modified stationary sources in *nonattainment areas* to ensure attainment of *national ambient air quality standards (NAAQS)*.

Nitrogen Dioxide (NO₂) -- The result of nitric oxide combining with oxygen in the atmosphere; major component of photochemical smog.

Nitric Oxide (NO) -- A gas formed by combustion under high temperature and high pressure in an internal combustion engine; it is converted by sunlight and *photochemical processes* in ambient air to *nitrogen oxide*. NO is a precursor of *ground-level ozone* pollution, or smog.

Nitrogen oxides (NO_x) -- A criteria air pollutant. Nitrogen oxides are produced from burning fuels, including gasoline and coal, thus, it can come from both stationary and *mobile sources*. It can also be formed in the atmosphere when *nitric oxide (NO)* undergoes photochemical reactions. Nitrogen oxides are major component of *photochemical smog*. They are also a major component of acid rain, and a major contributor to the formation of ozone in the *troposphere*.

Nonattainment area -- A geographic area in which the level of a *criteria air pollutant* is higher than the level allowed by the federal standards (i.e., does not meet one or more of the *NAAQS* for the *criteria pollutants*). A single geographic area may have acceptable levels of one criteria air pollutant but unacceptable levels of one or more other criteria air pollutants; thus, an area can be both *attainment* and nonattainment at the same time.

Offset -- A method established by the 1990 Clean Air Act to give companies, which own or operate large (major) sources in nonattainment 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. In doing so, emissions from proposed new or modified stationary sources are balanced by reductions from existing sources to stabilize total emissions. (Also see: emissions trading).

Opacity -- The amount of light obscured by particulate pollution in the air; clear window glass has zero opacity, a brick wall is 100 percent opaque. Opacity is an indicator of changes in performance of particulate control systems.

Organic -- A class of compounds containing mainly carbon, hydrogen and oxygen.

Organic Chemicals/Compounds -- Naturally occurring (animal or plant-produced or synthetic) substances containing mainly carbon, hydrogen, nitrogen, and oxygen.

Overfire air -- A control technology used to reduce NO_x emissions and control CO emissions where air is forced into the top of an incinerator or boiler to fan the flames that encourages the formation of nitrogen gas.

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. Gasoline is blended with alcohols or ethers that contain oxygen in order to reduce carbon monoxide and other emissions. 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.

Ozone -- A gas, which is a variety of oxygen. The oxygen gas (O₂) 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 (or O₃). 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 Depletion -- Destruction of the stratospheric ozone layer, which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules.

Ozone hole -- 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.

Ozone Layer -- The protective layer in the atmosphere, about 15 miles above the ground, that absorbs some of the sun's ultraviolet rays, thereby reducing the amount of potentially harmful radiation that reaches the earth's surface.

Part per billion (ppb)- One ppb is one one-thousandth of a ppm and is comparable to one-thousandths of a teaspoon of water in a 21ft. diameter and 4 ft. deep swimming pool.

Part per million (ppm)- ppm may be expressed as milligrams per kilogram or milligrams per liter. One ppm is comparable to one teaspoon of water in a 21ft. diameter and 4 ft. deep swimming pool.

Particulates / particulate matter (PM-10) – A Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions. Particulate matter includes dust, soot and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources, including burning of diesel fuels by trucks and buses, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining operations, agricultural burning (field and slash burning), and operation of fireplaces and woodstoves. Particulate pollution can cause eye, nose and throat irritation and other health problems. A criteria air pollutant.

Performance Standards -- 1. Regulatory requirements limiting the concentrations of designated organic compounds, particulate matter, and hydrogen chloride in emissions from incinerators. 2. Operating standards established by EPA for various permitted pollution control systems, asbestos inspections, and various program operations and maintenance requirements.

Permit -- A document that resembles a license, required by the Clean Air Act for big (major) sources of air pollution, such as power plants, chemical factories and, in some cases, smaller polluters. It is issued by EPA or an approved state agency to implement the requirements of an environmental regulation; e.g., a permit to operate a wastewater treatment plant or to operate a facility that may generate harmful emissions. 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. The 1990 Clean Air Act introduced a nationwide permit system for air pollution control.

“Permit to Install” Program – The MDEQ program under Rule 201 of the Michigan Administrative Rules for Air Pollution Control that requires all individuals to obtain a “Permit to Install” prior the installation, construction, reconstruction, relocation or modification of equipment that emits air contaminants to the ambient air.

Permit fees -- Fees paid by businesses required to have a permit. Permit fees are like the fees drivers pay to register their cars. The money from permit fees will help pay for state air pollution control activities.

Photochemical Oxidants -- Air pollutants formed by the action of sunlight on oxides of nitrogen and hydrocarbons.

Photochemical Smog -- Air pollution caused by chemical reactions of various pollutants emitted from different sources. (See: photochemical oxidants).

Pollutants (pollution) -- Unwanted chemicals or other materials found in the air. Pollutants can harm health, the environment and property. Many air pollutants occur as gases or vapors, but some are very tiny solid particles: dust, smoke or soot.

Prevention of Significant Deterioration (PSD) -- These are federal regulations concerning air pollution. It states that there is no significant deterioration of air quality in a region from a new source of pollutants. It requires *Best Available Control Technology (BACT)* and analysis of ambient air quality impacts.

Primary standard -- Pollution limit based on health effects. Primary standards are set for criteria air pollutants.

Process controls -- Modifications to the fuel, process or equipment to maximize the combustion efficiency; these are forms of pollution prevention. Process controls are essentially modifications or substitutions of the raw materials, fuels, equipment or process to minimize the formation of particulate matter.

Quality Assurance and Quality Control (QA/QC) -- A system of procedures, checks, audits, and corrective actions applied to ensure that all EPA research design and performance, environmental monitoring and sampling, and other technical reporting activities are of the highest achievable quality.

Reasonable Available Control Technology (RACT) -- Reductions on a source category basis as reasonable further progress towards attaining ambient air quality standards.

Reformulated gasoline -- Specially refined gasoline with low levels of smog-forming volatile organic compounds (VOCs) and low levels of hazardous air pollutants. The 1990 Clean Air Act requires sale of reformulated gasoline in the nine smoggiest areas. Reformulated gasolines were sold in several smoggy areas even before the 1990 Clean Air Act was passed.

“Renewable Operating Permit” Program -- A facility-wide permit required by Title V of the Clean Air Act Amendments of 1990. It clarifies the requirements that apply to a facility that emits air contaminants as a “Major Source”. It is renewed every five years.

Retention time -- The length of time the material is held in the system. How long from beginning to end.

Risk -- A measure of the chance (probability) that damage to life, health, property or the environment will occur.

Risk Assessment -- A scientific process that estimates the type and magnitude of risk to human health posed by exposure to chemical substances.

Screening Levels -- Acceptable or safe concentrations based on human health data. Screening levels are developed from toxicological data and are expressed in micrograms per cubic meter and in various averaging times; i.e.; 1 hour, 8 hours, 24 hours and annual. The list of screening levels (ITSLs, IRSLS, and SRSLs) are developed by the Air Quality Division

SRSL -- Secondary Risk Screening Level is designed to be protective for carcinogenic effects.

Secondary standard -- A pollution limit based on environmental effects such as damage to property, plants, visibility, etc. Secondary standards are set for criteria air pollutants.

Selective Non-Catalytic Reduction (SCNR) -- Injecting ammonia or urea to control NO_x emissions by reacting nitric oxide (NO) with a nitrogen-bearing compound to form nitrogen gas (N₂).

Semi-volatile -- Evaporates slower than a volatile compound. See SVOC.

Semi-Volatile Organic Compound (SVOC) -- A compound containing carbon that does not evaporate as readily as a VOC and has a boiling point greater than 200°C.

Solubility -- Ability of a substance to dissolve in liquid. Sugar is soluble in water but oil is not water-soluble.

Surface Water -- All water naturally open to the atmosphere (rivers, lakes, ponds, etc).

Sludge -- A semi-solid residue from any of a number of air or water treatment processes; can be a hazardous waste.

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 comes from burning of petroleum-based fuels such as gasoline. Other smog-formers, volatile organic compounds, are found in products such as paints and solvents. 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 or temperature inversion (weather condition in which warm air is trapped close to the ground instead of rising). Smog is often worse away from the source of the smog-forming chemicals, since the chemical reactions that result in smog occur in the sky while the reacting chemicals are being blown away from their sources by winds.

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 or planes, are called mobile sources.

State Implementation Plan (SIP) -- EPA approved state plans for the establishment, regulation, and enforcement of air pollution standards.

State implementation plan (SIP) -- A detailed description of the programs a state will use to carry out its responsibilities under the Clean Air Act. State implementation plans are collections of the regulations used by a state to reduce air pollution. The Clean Air Act requires that EPA approve each state implementation plan. Members of the public are given opportunities to participate in review and approval of state implementation plans.

Stationary source -- A place or object from which pollutants are released and which does not move around. Stationary sources include power plants, gas stations, incinerators, houses etc.

Stratosphere -- Part of the portion of the atmosphere 10-to-25 miles above the earth's surface, the gases that encircle the Earth. The stratosphere is a layer of the atmosphere 9-31 miles above the Earth. Ozone in the stratosphere filters out harmful sunrays, including a type of sunlight called ultraviolet B, which has been linked to health and environmental damage.

Sulfur dioxide (SO₂) -- A criteria air pollutant. Sulfur dioxide is a gas produced by burning coal, most notably in power plants. Some industrial processes, such as production of paper and smelting of metals, produce sulfur dioxide. Sulfur dioxide is closely related to sulfuric acid, a strong acid. Sulfur dioxide plays an important role in the production of acid rain.

Technical Advisory Committees (TACs) -- TACs have representation from a wide range of agency, stakeholder and public groups interested in, and/or affected by, these environmental issues.

Temperature inversion -- one of the weather conditions that are often associated with serious smog episodes in some portions of the country. In a temperature inversion, air doesn't rise because it is trapped near the ground by a layer of warmer air above it. Pollutants, especially smog and smog-forming chemicals, including volatile organic compounds, are trapped close to the ground. As people continue driving, and sources other than motor vehicles continue to release smog-forming pollutants into the air, the smog level keeps getting worse.

Threshold Level -- The minimum concentration of a substance at which negative health effects begin to appear.

Toxic -- A poisonous or hazardous substance; having poisonous or hazardous qualities.

Toxic Air Contaminates (TACs) -- These are toxic chemicals found in the air stream. Michigan rules define toxic air contaminant as any air contaminant for which there is no *national ambient air quality standard (NAAQS)* and which is or may become harmful to public health or the

environment when present in the outdoor atmosphere in sufficient quantities and duration. Air toxic rules do not apply to existing sources. Concentrations of the toxic air contaminants emitted must not exceed the applicable health based screening level. {Original "air toxic rules" were promulgated on April 17, 1992; revisions became effective on November 10, 1998 – info origin: MDEQ AQD web site} modify.

Toxicity -- A measure of the poisonous or harmful nature of a substance. The degree to which a substance or mixture of substances can harm humans or animals.

Toxicity Characteristic Leaching Procedure (TCLP) -- A test designed to predict whether toxic chemicals are likely to leach into subsurface soils and groundwater (i.e., Leaching testing method to determine concentration of contaminants in soils that could impact groundwater). Also used for determining the effectiveness of treatment processes, such as stabilization and solidification, designed to contain wastes or toxic chemicals.

Toxicology -- The study of adverse effects of chemicals on living organisms.

Troposphere -- The layer of the atmosphere closest to the earth's surface.

Ultraviolet B (UVB) -- A type of sunlight. The ozone in the stratosphere, high above the Earth, filters out ultraviolet B rays and keeps them from reaching the Earth. Ultraviolet B exposure has been associated with skin cancer, eye cataracts and damage to the environment. Thinning of the ozone layer in the stratosphere results in increased amounts of ultraviolet B reaching the Earth.

Vapor -- Gaseous phase of any substance that is liquid or solid at atmospheric pressures and temperatures. For example, steam is a vapor.

Vaporize -- Change the state from liquid to gas.

Vapor recovery nozzle -- A special gas pump nozzles that will reduce release of gasoline vapor into the air when people put gas in their cars. There are several types of vapor recovery nozzles, so nozzles may look different at different gas stations. The 1990 Clean Air Act requires installation of vapor recovery nozzles at gas stations in smoggy areas.

Vitrification -- In the Minergy process this is the manufacture of a reusable glass aggregate by heat fusion.

Volatile -- A substance that is readily evaporated.

Volatile organic compounds (VOCs) -- Organic chemicals all contain the element carbon (C); organic chemicals are the basic chemicals found in living things and in products derived from living things, such as coal, petroleum and refined petroleum products. Many of the organic chemicals we use do not occur in Nature, but were synthesized by chemists in laboratories. Volatile chemicals produce vapors readily; at room temperature and normal atmospheric pressure, vapors escape easily from volatile liquid chemicals. Volatile organic chemicals include gasoline, industrial chemicals such as benzene, solvents such as toluene and xylene, and

tetrachloroethylene (perchloroethylene, the principal dry cleaning solvent). Many volatile organic chemicals are also hazardous air pollutants; for example, benzene causes cancer.

Or **VOC** -- An organic compound that evaporates easily, such as paint thinner.

Volatilization -- The process by which substances are released into the atmosphere as a gas through rapid vaporization or evaporation.

Wastewater -- Spent or used water from an individual home, community, farm or an industry that contains dissolved or suspended substances.

Wet scrubber -- A control technology using water to remove particulates still suspended in the gas stream, by making them larger.