SAFE AIR HEALTH

Air Quality Glossary Terms

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Aerosol

A mixture of microscopic solid or liquid particles in a gaseous medium. Smoke, haze, and fog are aerosol examples.

Air Pollution

Degradation of air quality resulting from unwanted chemicals or other materials occurring in the air.

Air Quality Index (AQI)

A nationally calculated index for reporting and forecasting daily air quality presented as a color-coded scale that ranges from Green or Good (0 to 50) through to Maroon or Hazardous (301 to 500). As the AQI value increases, the percentage of the population increases of those who are likely to experience increasingly severe adverse health effects. The AQI is based on the four most common air pollutants regulated under the Clean Air Act: ground-level ozone (O3), particle pollution (PM10 and PM2.5), carbon monoxide (CO), sulfur dioxide (SO2) and nitrogen dioxide (NO2).

At-Risk Individuals

Include people with chronic conditions (heart or lung disease, diabetes, etc.), especially the very young, the elderly and women of childbearing age.

Black Carbon (BC)

BC or soot is formed during high-temperature fuel combustion. Diesel vehicles are the major source of BC in the U.S. In several major cities, BC concentrations are found to be elevated near busy roadways and industrial facilities such as coke ovens, steel mills and in the river valley.

Carbon Dioxide (CO2)

This is the most significant, persistent greenhouse gas in the Earth's atmosphere capable of lasting 1,000 years. It is produced by the combustion of carbon-based fuels such as wood and other organic materials and fossil fuels such as coal, peat, petroleum, and natural gas. It is also a byproduct in many large-scale oxidation processes.

Carbon Monoxide (CO)

A colorless, odorless gas that can be harmful when inhaled in large amounts. CO is released when something is burned and when the supply of oxygen is limited. The greatest sources of CO in outdoor air are cars, trucks and other vehicles or machinery that burn fossil fuels. The main sources of CO indoors are gas stoves and ovens, clothes dryers, water heaters, furnaces & boilers, motor vehicles (attached garage), tobacco smoke, grills generators, power tools and lawn equipment.

Carcinogen

A chemical or physical agent capable of causing cancer.

Criteria Pollutants

The EPA has established national ambient air quality standards (NAAQS) that define limits on concentrations of six of the most common air pollutants in the air we breathe. They are ozone (O3), particulate matter, carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxides (SO2), and lead (Pb).

Emissions

The release of pollutants into the air from a source.

Flaring

The burning of gas and chemical by-products in order to prevent disruptions in operations, relieve pressure within the system and adjust product quality. Elevated flares are located above the facility and are designed to burn larger volumes of gas than ground flares. Ground flares are located at ground level and can either be enclosed or open.

Fracking

Short for hydraulic fracturing, is a gas well extraction technique that fractures shale rock layers using a pressurized liquid. This process injects high pressure 'fracking fluid' (a mixture of water and hazardous chemicals) into a wellbore to create cracks in the deep-rock formations that allow the release of natural gas or petroleum. Each well takes about 1 – 3 million gallons of fracking fluid. After the fracking process is completed, the well returns about 1/3 of the fluid immediately as flowback water, a briny mixture of water, fracking fluid and minerals dissolved from the shale. The well also returns about 500 barrels of producer fluid, a supersaturated mixture of water, fracking fluid and dissolved minerals from the well.

Fugitive Emissions

Air pollution emissions due to process equipment leaks that cannot reasonably pass through a stack chimney or vent.

Greenhouse Gases (GHG)

GHG act like an insulating blanket, trapping heat in the atmosphere and warming the Earth. Four common GHG are carbon dioxide, methane, nitrous oxide, and fluorinated gases, which remain in the atmosphere for differing amounts of time, ranging from a few years to thousands of years.

Ground-Level Ozone (O3)

O3 is formed in the atmosphere through reactions with other pollutants. Ozone often forms in the summer months when nitrogen oxides (NOx) and volatile organic compounds (VOC) combine and react in the presence of sunlight and warm temperatures. Ozone irritates the eyes and upper respiratory system; hampers breathing and causes asthma.

Hazardous Air Pollutants (HAPS)

Pollutants that contribute to mortality, serious irreversible illness or incapacitating reversible illness. The Clean Air Act lists 197 HAPS. Common HAPs include benzene, ethylbenzene, toluene, and xylene, typically emitted by industrial plants and petroleum refineries and coke ovens.

Haze

An atmospheric aerosol of sufficient concentration to be visible. The particles are so small that they cannot be seen individually but are still effective attenuating light and reducing visual range.

HEPA (High-Efficiency Particulate Air) Filter

A pleated, mechanical air filter that traps dust and dirt that would negatively impact indoor air quality. HEPA filters can remove 99.97% of dust, pollen, mold, bacteria, and airborne particles that are 0.3 microns (µm) in diameter or larger.

Inversion

This is an atmospheric condition where a layer of cooler air becomes trapped near the earth's surface by a layer of warmer air above. When the air cannot rise, pollution on the ground becomes trapped and can accumulate, leading to higher concentrations of ozone and particle pollution. The river valleys of Southwestern Pennsylvania are frequently subject to inversions.

Lead

Much of our exposure to lead comes from human activities including the use of fossil fuels, past use of leaded gasoline, some industrial facilities, and the past use of lead-based paint. Lead can affect almost every organ and system in the body. Children and babies are particularly at risk. Even low levels can cause behavior and learning problems, lower IQ, slowed growth, hearing problems and anemia.

Modeling

Air modeling is a way to mathematically simulate atmospheric conditions and behavior. It is usually performed using computer programs. For example, air pollution modeling can help estimate how much of a specific air pollutant will be present at different distances from the source.

National Ambient Air Quality Standards, (NAAQS)

The limits on pollution volumes that the EPA deems necessary to protect air quality and health. NAAQS have been established for the six criteria pollutants under the Clean Air Act.

Nitrogen Oxides (NOx)

Major components of smog.

Ozone

Created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC). This happens when pollutants emitted by cars, and other power sources, chemically react in the presence of sunlight. At ground level, it is a harmful air pollutant to humans and the environment.

Particle Pollution

Also called soot, particulate pollution is a mixture of solid particles and liquid droplets. Fine particles are a subset of this group, the smallest of which measures 2.5 microns or less in diameter 1/30th the width of a human hair.

PM10 (also known as Coarse Particles)

Particulate matter in air, comprised of solid particles and liquid droplets, that has an aerodynamic diameter less than 10 micrometers. These inhalable particles are generally 10 micrometers in size and smaller.

PM2.5 (also known as Fine Particles)

These fine, microscopic particles with a diameter less than 2.5 micrometers threaten public health because they can be inhaled deeply into the lungs, enter the bloodstream, and cause adverse health effects. The average human hair is 30 times larger than PM2.5.

Sensitive Groups (At-Risk Populations)

A term used for people who have an increased risk of experiencing adverse health effects related to air pollution exposures. These increased risks are often due to biological factors, external or non-biological factors, higher exposures and/or increased dose at a given concentration. The severity of the health effects that these groups experience may be much greater than in the general population.

Smog

A mixture of air pollutants, principally ground-level ozone, produced by chemical reactions involving smog-forming chemicals.

Sulfur Dioxide

A criteria pollutant harmful to human health and the environment. The largest sources of SO2 emissions are fossil fuel combustion at power plants and other industrial facilities.

TRI

The U.S. Toxics Release Inventory. Under federal law, manufacturing facilities are required to report the amounts of approximately 650 toxic chemicals that they release into the environment or produce as waste.

Volatile Organic Compound (VOC)

An organic chemical compound whose composition and physical properties make it possible for it to evaporate or sublimate under normal atmospheric conditions of temperature and pressure. They result from both human causes (i.e., paint strippers, pesticides, glues, and adhesives) and natural processes (which release millions of tons of the gas into the atmosphere). All told, carbon-bearing VOCs from natural sources account for over 10 times the number of annual emissions compared to humans release of carbon bearing VOCs yearly.

Wood Burning

Pollution from wood burning is especially dangerous for those with existing health conditions, children, and the elderly, it is hazardous even to young, healthy people. Wood burning causes inflammation of the lungs and decreases lung volume.

Wildfire Terms You Should Know

Fire weather

Fire weather is the term used to highlight that the current weather conditions are highly favorable for a fire to start.

Fire weather watch

Weather forecasters use this term to inform the public that the weather conditions pose a high-risk for the development of a dangerous fire. These watches are issued 24 to 72 hours prior to an event so it should give you just enough time to gather your emergency kits and make evacuation arrangements if your area is in a high-risk zone.

Red Flag Warning

A red flag warning is issued by the weather forecasters to inform the public of an ongoing critical fire. This type of warning should be taken very seriously.

Spot fire

A spot fire is when flying embers or sparks from an already-existing fire cause a new fire to form. T his is especially common when wind speeds are high.

Ground fire

This type of fire is most often caused by a lightning strike. It typically burns just below the ground and ignites the organic soil layer including roots, dead moss, and other materials. Ground fires can reach the surface and become surface fires.

Surface fire

These types of fires can be low or high intensity but they move slowly, typically through the forest, only burning whatever is on the surface of the ground: shrubs and trees.

Crown fire

A crown fire is a fast-moving fire, usually because it's accompanied by high wind. Crown fires ignite the tops of trees and can be caused by surface fires. They have a higher heat intensity. You may also hear the term "running crown fire' which refers to an even more dangerous version of a crown fire since they travel faster.

Test fire

On occasion you'll see fire crews and personnel working on a controlled, or test, fire. Test fires are done to lower the possibility of that area becoming a high-risk fire zone later on. Test fires are contained so that they don't spread beyond a pre-determined perimeter. They're done on days where the fire risk is low so that they don't spread, but on occasion, they can get out of control.

Fire intensity

This refers to the amount of heat that is released during a fire.

Containment

This is a percentage given to indicate how much of the fire is under control.