DESERT BREEZE

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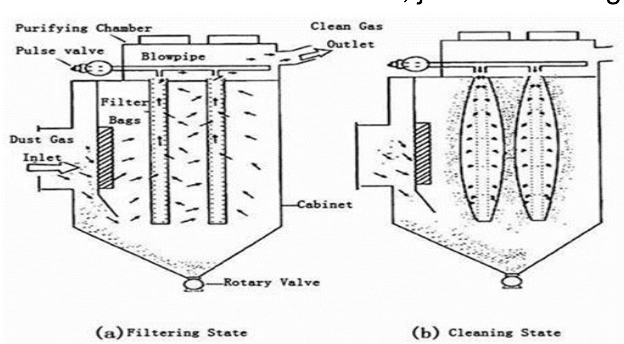
Baghouses

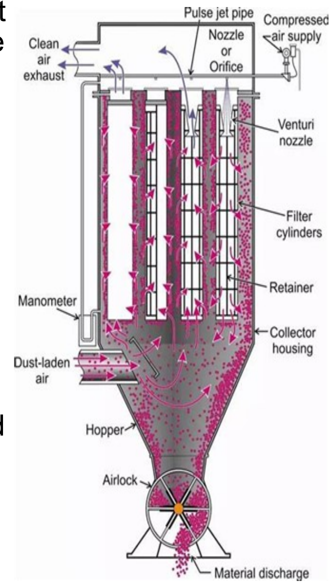
The District is concerned with the control of emissions of particulate matter (PM) into the atmosphere. PM is typically easier to control than other pollutants due to the ease and efficiency of available PM control devices. One of the most versatile and cost-effective control devices available is a baghouse, which works in a similar fashion as a household vacuum dust collection bin and filter system.

Baghouses are used in manufacturing operations such as woodworking, storage silos, hot mix asphalt facilities, cement manufacturing, or other operations that contain emissions of fine PM or dust. Baghouses differ in the type of filter used, fan location and the resulting airflow configuration, and are named by the method used for cleaning the filters.

The types of filters used in a baghouse system are either fabric bags or cartridge canisters. Cartridges are good for small particles and are comprised of corrugated paper or fabric in either a cylindrical or rectangular shape. Cartridges are beneficial because of their compact size and can be placed close to the particle source. Bags can vary from 4 to 20 feet long, and the fabric type will vary depending on the need. Fabric bags can be configured with dozens to thousands of bags in a baghouse, are good for small particles, and can remove over 99% of PM_{10}.

With fabric filters, optimum control efficiency is not achieved until the back of the filter is dirty; this causes a "cake" to form, which facilitates effective filtration. However, once too much PM has built up, the airflow pressure will drop, and the filtration will not be effective. Therefore, just like the bag of your vacuum cleaner at home, the PM must be removed. Baghouse "types" are characterized by their dust collection/removal methods:





- A Shaker removes the PM by mechanically shaking the bags which are connected to rods and shafts attached to a motor. The shaking causes the PM to fall.
- A high percentage of baghouses use Pulse Jet technology, which blasts a high pressure shot of air into the bag, creating a shockwave effect; the bag expands and contracts, causing the PM cake to crack and fall. The air shockwave travels up and down the bag in approximately half a second.
- Reverse Air Systems stop the airflow of dirty air and instead backflows clean air into the compartment. The low air pressure causes the bags to collapse, thus breaking the dust cake and causing the PM to fall. This process takes 1 to 2 minutes, and can be conducted every thirty minutes to every few hours, depending on the inlet dust concentration.

When the dust has been removed from the filter bag, it falls into a collection device called a hopper. The hopper contains the PM until it is removed by a discharge device such as valves or a conveyer system. The material can then be recycled in the operation or stored in dry bulk storage tank or silo until ready for transport and disposal. With the right technology and efficient practices, control of PM can be achieved.

By: Katie Lantz, Air Quality Specialist

Phase II Gasoline Dispensing Facilities

PART 2 OF 4

Gasoline Dispensing Facilities (GDF's) consist of two phases in Vapor Recovery Systems:

Phase I—recovers vapors from the cargo tank to the faculty's storage tank.

Phase II—recovers vapors from the faculty's storage tank to the vehicle. Fuel is pumped from the storage tank to the vehicle as vapors and are pulled from the vehicle back into the storage tank.

In 1990, the Federal Clean Air Act began requiring Phase I and Phase II vapor recovery systems at gas stations in ozone non-attainment areas dispensing over one-hundred-thousand gallons of gasoline per month across the United States. In 2000, the California Air Resource Board (CARB) implemented Enhanced Vapor Recovery (EVR) to achieve additional emission reductions and to increase the in-use performance lifespan of vapor recovery equipment. All gas stations in California dispensing over one-hundred-thousand gallons of gasoline per month are equipped with vapor recovery systems. Phase II vapor recovery equipment is required to control ninety-five percent of emissions with the implementation of EVR; furthermore, Phase II equipment cannot release more than 0.38 pounds of emissions for everyone one-thousand gallons of gasoline dispensed.

Vapor recovery systems are necessary because gasoline emissions are released from GDF's. The emissions are vapors that contain Oxides of Volatile Organic Compounds (VOC's). Oxides of Nitrogen (NO_x) are prevalent in the atmosphere. When NO_x and VOC's mix with heat and sunlight, a chemical reaction occurs forming ozone at ground level. Ground level ozone is a Green House Gas, that is a major component of smog, and is harmful to the environment and human health. GDF's have the highest potential for human exposure to VOC vapors. Without Phase II Vapor Recovery Systems, the consumer at the pump would be exposed to more concentrated amounts of vapors leaking into the environment.

Local Air Districts permit GDF's for vapor recovery equipment and enforce vapor recovery rules. Air District rules must enforce Health and Safety Code and California Benzene Airborne Toxic Control Measures (ATCM) regulations. They may also include additional requirements for GDF's, such as record-keeping of maintenance and testing performed on the equipment.

There are two types of Phase II Equipment:

Balance: transfers vapors from the vehicle tank to the station storage tank without the assistance of an external force.

Assist: transfers vapors from the vehicle tank to the station storage tank with the assistance of an external force (i.e. vacuum).

It is important to determine which system a station has, because the Phase II component must be compatible to the appropriate system per the Executive Order and air district permit conditions.

Phase II components are as follows:

- Whip Hose: The small portion of the hose above the breakaway
- Breakaway: Designed to allow the hose and nozzle to disconnect in the event of a drive off preventing further damage.
- Curb Hose: Longer portion of the hose between the breakaway and the nozzle.
- Nozzle: Dispenses gasoline from the storage tank to the vehicle tank.
- Pressure Management Device: Assist systems can only be equipped with the FFS/Healy Clean Air Separator. Balance systems can be equipped with the following: FFS/Healy Clean Air Separator, Veeder-Root Vapor Polisher, Hirt VCS 100 Processor, VST ECS Membrane Processor, and the VST Green Machine. In Eastern Kern County, the following are the most common:

  ***FFS/Healy Clean Air Separator: A 400-gallon bladder that contains vapor growth and helps prevent excess fugitive emissions**.

  ***Veeder-Root Vapor Polisher: Contains a bed of activated carbon. Vapors are absorbed by the carbon during positive pressure. Fresh air is drawn in and vapors are desorbed during negative pressure.**

An inspector with the air district will inspect the components to ensure that they are in compliance with the stations Executive Orders and permit conditions. Furthermore, an inspector will look for damage that may lead to vapor leaks while gasoline dispensing is taking place. If a component is deemed noncompliant or damaged in a way that it creates a risk of exposure, the equipment will be tagged out of service. Once a repair or replacement

By: Heather Handy, Air Quality Specialist

Pollutant of the Quarter: Nickel

Nickel is the naturally occurring element found in the earth's crust, soil, and rocks. It is also used in various industrial processes such as metal plating, stainless steel production, and battery manufacturing. While nickel is an essential trace element for plants and animals, exposure to high levels of nickel can have harmful effects on human health and the environment. In 1991, the California Air Resources Board classified nickel to be established as a Toxic Air Contaminant (TAC).

In the air, nickel can be present in the form of particulate matter, which is a mixture of tiny particles and liquid droplets. Metals, such as nickel, are considered airborne fine (PM 2.5) particulate matter. Metal particles can be released into the atmosphere from various sources such as power plants, industrial facilities, municipal and industrial waste, and motor vehicles. Wildfires also emit significant levels of metals, including nickel. Once in the air, nickel particles can travel long distances and remain suspended for days or even weeks.

Exposure to high levels of nickel in the air can cause a range of health problems. Inhalation of nickel particles can irritate the lungs and cause respiratory problems such as coughing, wheezing, and shortness of breath. Inhalation of nickel has the highest risk of adversity. Inhaling particulate matter containing metals, such as nickel, may be able to translocate from the lungs into systemic circulation and induce adverse effects on cardiovascular system. Soluble and insoluble nickel compounds are classified as carcinogenic to humans. Long-term and chronic exposure to nickel in the air has been linked to an increased risk of lung cancer and other respiratory diseases.

To mitigate the harmful effects of nickel pollution, various measures can be taken. Industrial facilities can install air pollution control technologies to reduce their emissions of nickel and other particulate matter pollutants. Industries in the Eastern Kern must implement various particulate matter technologies capable of capturing nickel and other particulate matter. Some examples include fabric collectors, cyclones, and over-spray filters. Individuals can also take steps to reduce their exposure to nickel by avoiding areas with high levels of pollution and remain indoors when wildfire smoke is impacting our community. When avoidance is not possible, the usage of N95 masks will aid in effectively filtering out most particulate matter.

By: Melissa Atkerson, Air Quality Specialist

Firework Safety

It is that time of year again when everyone across the World will be hosting barbecues, going to the beach, and celebrating the Fourth of July holiday with family, friends, and fireworks. This time of year, however, may present some big safety concerns especially when it comes to fireworks. The misuse of fireworks can result in wildfires, property damages, personal injuries, and even death. The way that we can prevent these things from occurring is by following a few safety tips that will help everyone have a safe Fourth of July holiday.

Did you know approximately 19,000 fires in the U.S. are started by fireworks every year? According to the National Fire Protection Association, in 2018, an estimated 19,500 fires were started by fireworks and were reported to local fire departments. In the same year, fireworks were responsible for 59% of all brush, grass, and forest wildfires.

Why the District Cares? Firework smoke can produce a mix of air pollutants and toxic chemicals including but not limited to particulate matter with an aerodynamic diameter of 10 microns or less (PM10), Sulfur Oxides (SOx), Oxides of Nitrogen (NOx), Volatile Organic Compounds (VOC), Carbon Monoxide (CO), lead, nickel, cadmium, antimony, and polycyclic aromatic hydrocarbons (PAHs). Fortunately, most health effects associated with firework smoke, can be mitigated by limiting long term exposure, especially for those individuals who have underlying respiratory conditions.

Did you know a substantial increase in Emergency Room Visits occur every 4th and 5th of July? According to the United States Consumer Product Safety Commission, in 2021, there was an estimated 8,500 firework-related injuries (or 74 percent of the total estimated fireworks-related injuries in 2021) that were treated at U.S. Emergency Rooms from June 18th through July 18th. The following safety tips will help everyone have a safe, enjoyable, and sound Fourth of July.

- Never allow children to play with or ignite fireworks including sparklers.
- Make sure fireworks are legal in your area before buying or using them.
- Keep a bucket of water or a garden hose handy in case of fire or other mishap.
- Light fireworks one at a time, then move back quickly.
- Never try to re-light or pick up fireworks that have not ignited fully.
- Never use fireworks while impaired by alcohol and drugs.
- Keep people with respiratory conditions upwind and away from the smoke.
- To prevent injuries, never throw fireworks and always follow lighting instructions properly.
- Store fireworks in a secure location to prohibit access by children.

By: Miguel Sandoval, Air Quality Engineer

Board of Directors

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Board of Directors usually meet once every two months starting in January at the District's Board Room, 414 W. Tehachapi Blvd., Suite D, in Tehachapi. The Meeting Agenda can be located on the District website www.kernair.org, under the "Board" tab.

Air Pollution Control Officer

Glen E. Stephens, P.E.

Hearing Board Members

Doris Lora
Chris Ellis
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For news updates and other information, please visit the Eastern Kern APCD website at www.kernair.org

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