DESERT BREEZE

VOLUME XI ISSUE I

MARCH 2023

Pollutant of the Quarter:

Wood Dust

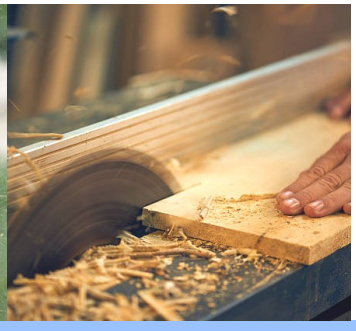
Wood dust is created when machines or tools are used to cut or shape wood. High amounts of wood dust are produced in sawmills, furniture making, cabinet making, and carpentry industries.

Exposure to wood dust has been long associated with a variety of health effects including: dermatitis, allergic respiratory effects, mucosal, and nonallergic respiratory effects. Wood dust, before 1985, was regulated by the United States Occupational Safety and Health Administration (OSHA) under its nuisance standard of 15-mg/m^3. It was later determined the nuisance standard only covered inorganic dusts. In 2009, the California Office of Health Hazard Assessment (OEHHA) listed wood dust as a human carcinogen. Cal/OSHA has set Wood Dust 8-hour Permissible Exposure Limit (PEL) of 2-mg/m^3. There is a special PEL for Western Red Cedar of 0.5-mg/m^3 because it is considered more toxic than many other types of wood.

Wood dust can cause many health and safety problems. Wood dust can irritate skin and eyes; and is also listed as a cancer -causing agent on California's Proposition 65 list. Wood dust may burn if exposed to heat or flames. Additionally, wood dust can cause or trigger work-related asthma. People who have asthma can experience: chest tightness, trouble breathing, coughing and wheezing.

Wood Working -- What should you do to minimize your exposure to wood dust? The best protection from wood dust is to keep it out of the air. The following are helpful:

- ◊ ***Enclose*** woodworking machines.
- ◊ Use local ***exhaust ventilation*** for machines & tools.
- ◊ ***Ventilate*** the room (or work outside).
- ◊ Maintain tools (***sharp tools*** put less dust in the air).
- ◊ Maintain good work practices, housekeeping and hygiene
- ◊ Properly ***dispose*** of waste.



Finally, use **respirators** during wood working activities in poorly ventilated areas. A respirator covers your nose and mouth and seals closely to your face. If your respirator fits well, is well maintained, and has the correct filters or cartridges, it can reduce the amount of dust or chemicals you breathe. There are two main types: a half-face respirator (covering the lower half of your face); and the full-face respirator (covering your whole face, including your eyes). Some respirators are disposable, but with others you can replace the filter cartridges. Filters and cartridges should be replaced if they become clogged or if it is hard to breathe.

As usual, proper safety procedures will protect you and minimize your potential to trigger asthma and lung cancer. The following will help while working with wood:

- ♦ Work outside when you are sanding or creating fine wood dust. Wear a dust mask or respirator that fits snugly and comfortably.
- ♦ Consider installing a dust-collection or air-filtration system in our indoor work space to help capture and remove dust at the source.
- ♦ Consider using a saw hood or sanding table that has suction to pull dust particles downward to prevent inhalation, *especially if you are sanding wood that is glued, laminated, or has synthetic finishes.*
- ♦ Do not use brooms, blowers, fans or compressed air to move the dust.
- ♦ Vacuum with high efficient particulate air (HEPA) filter or use a shop vacuum cleaner with HEPA filter.
- ♦ Use wet clean-up methods, such as removing dust with wet rags.
- ♦ Carefully bag and seal wood dust from vacuum of other dust extraction systems.
- ♦ Change clothes that contain wood dust before entering your home, car, or other areas.

Be safe in the wood shop!

By: Glen Stephens, Air Pollution Control Officer

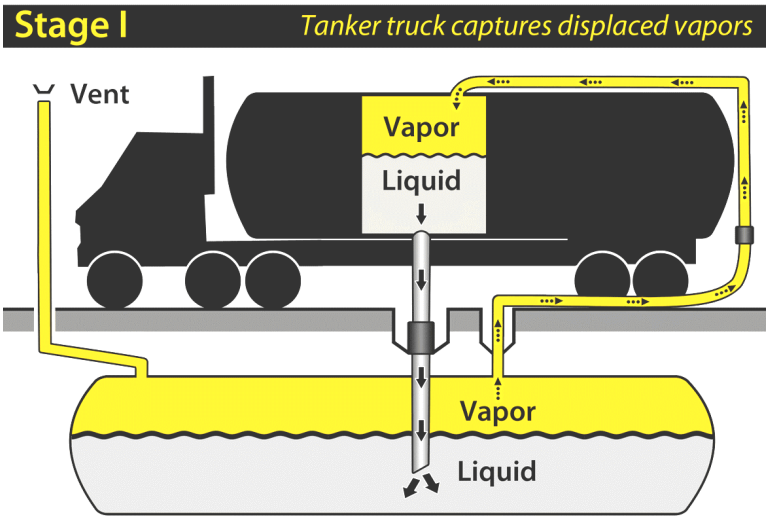
Gas Stations — Delivery (Phase 1)

PART 1 OF 4

Gasoline Dispensing Facilities (GDF) or 'Gas Stations' are one type of potential source for emissions that come from vapors that contain Volatile Organic Compounds (VOCs), and are considered an 'Area Source Category' as defined by the U.S. Environmental Protection Agency (EPA). When gasoline vapors are released from the tailpipes of vehicles, while fueling vehicles (Phase 2), or when fuel is delivered by cargo truck to the gas station (Phase 1), there is a potential for vapors to be released to the environment. A Phase 1 (or Stage 1 Vapor Recovery) is part of the system that recovers volatile vapors during the transfer of fuel from the cargo delivery tanker to the fuel storage tank located at the GDF.

The emissions from gasoline contribute to ozone pollution, which is harmful to humans and to the environment. There are over 13,000 gas stations currently in operation in California, and facilities that dispense over 100,000 gallons per month are required to be equipped with a vapor recovery system. The vapor recovery system is a certified component (approved by the California Air Resources Board [CARB]) through Executive Orders, and is required to be tested according to CARB procedures, by a certified technician. Whenever a Vapor Recovery Test is performed, a notification to the District is required prior to the test and must be successfully completed. Upon completion of the test, a report of the results will be submitted to the District.

In Phase 1 fuel delivery, the driver is responsible to ensure that emissions associated with the transfer from the cargo truck to the GDF tank are being controlled from release into the environment. The greater the quantity of fuel dispensed by the GDF, the increased requirements for compliance through the implementation of Best Management Practices.



The requirements associated with Phase 1 fuel delivery are:

Equipment:

- Fill Pipes Covers: The covers should be in good condition with fit gasket seals. All connections and lines should be equipped with CARB approved closures.
- GDF must use submerged fill pipes or drop tubes to reduce splashing when the fuel is loaded. Additionally, the facility must operate a vapor balance system, which reduces the amount of fuel vapors released when the storage tank is filled. The vapor balance system is a series of hoses on the truck that return vapors from the tank back to the truck during delivery.
- Vapor Balance Connections: The delivery truck hoses can only be Dual point — one hose to deliver fuel into the GDF tank and a second hose to return vapors back to the tanker truck.
- Fill pipes (or drop tubes): Are required to be 6 inches from the bottom of the tank for the discharge of fuel to reduce emissions during the fuel delivery.
- Fuel measurement pole: Before 'dropping' the fuel load into the tank, the delivery driver should take a measurement of the quantity of fuel contained in the tank prior to delivery. This is to ensure that there is sufficient space available in the tank to receive the quantity of fuel being delivered. (Note: The tank is not intended to receive fuel to the maximum capacity and should contain a 'head-space' within).

Recordkeeping:

◊ Keep accurate records of the quantity of fuel shipment received and gallons dispensed (throughput).

Requirements:

* Tanker truck pressure cannot exceed 18 inches of water pressure or 5.9 inches of water vacuum during fuel transfer.
* Vapor balance systems are required to prevent over-tight or loose-fitting connections during product transfers. The driver should inspect all connections and transfer tubing prior to delivering the fuel from the truck to the tank.
* The Spill Bucket must be free of excess fuel or liquid prior to the driver leaving the facility.
* Clean up any spilled fuel that may occur.

Proper operation of these systems reduce VOC emissions into the environment, decrease ozone, and improve the air we breathe.

By: David Arokiasamy, Air Quality Specialist

Thermal Oxidizers

In the world of air pollution, there are a heap of pollutants emitted from different processes. Due to this reality, there is a constant struggle to eliminate these pollutants by using air pollution control devices; pieces of equipment that destruct an air pollutant. One such device is a thermal oxidizer. Other names for thermal oxidizers include thermal incinerator and afterburner.

What Does a Thermal Oxidizer Do?

A thermal oxidizer is a device that uses combustion to destroy/break down volatile organic compounds (VOCs), carbon monoxide (CO), some volatile hazardous air pollutants (HAPs) as well as some particulate matter (PM) like soot—which is usually unburned fuel. Theoretically, perfect combustion will break down VOCs to water and carbon dioxide; add an oxygen molecule to carbon monoxide to make it carbon dioxide, break down a HAP enough to be neutralized and captured by another in line air pollution control device or complete the combustion of PM.

How Does a Thermal Oxidizer Work?

Thermal Oxidizers usually consist of a combustion chamber with fuel burners, an auxiliary air fan and an exhaust stack. Supplemental fuel types (like natural gas) can be used if the concentration of the pollutant is too low to ignite. The process works by pulling in the pollutant gas to the combustion chamber, burning the pollutant at a temperature high enough to cause destruction, and expelling the cleaner air through the exhaust. The temperature the combustion chamber must operate ranges from 1300°F-1800°F. The process must also consider residence time, which is the amount of time that the pollutant gas stays in the presence of the combustion gases. Depending on the pollutant gas, the combustion temperature and residence time must be accounted for and met by the equipment. The last factor of importance is turbulence or air mixing. The mixture of pollutant gas and air must be present to have a highly efficient destruction of pollutants. Thermal oxidizers have a destruction efficiency (how effective the device is removing the pollutant) ranging from 95%-99% if optimally operated.

Recuperative thermal oxidizers and regenerative oxidizers are two common types of oxidizers used in controlling VOCs; they differ in the type of heat exchange that is used. Recuperative thermal oxidizers usually use plate-to-plate or shell and tube heat exchangers. Heat exchangers are used to transfer heat from one medium to another and are important in closed combustion as they keep the heat generated in the combustion process from dissipating. Regenerative thermal oxidizers use a media such as ceramic which absorbs the heat from the process of combustion and keeps the heat localized and allows the oxidation process to continue. Heat recovery is important as it reduces the amount of auxiliary fuel used.

What Sources Use Thermal Oxidizers?

Large-parts coating facilities, coating manufacturers, chemical plants, large printing operations and ethanol distillers may use thermal oxidizers.

While thermal oxidizers have a high destruction efficiency when dealing with VOCs, not all facilities who emit VOCs have a thermal oxidizer due to cost. They may not emit enough VOCs to get a thermal oxidizer to work properly, and would install another air pollution control device instead, such as a carbon adsorber, or a flare if there were a very high concentration of VOC.

By: Nicole Dickerson, Senior Air Quality Specialist

Improving Ozone Trends

For the first time since the 75 parts per billion (ppb) ozone National Ambient Air Quality Standard (NAAQS) was adopted by the EPA in 2008, the District had no recorded exceedances in a calendar year at the official monitoring site in Mojave, California.

This accomplishment is the result of years of diligent effort by the District, residents, and regulated facilities working together. Many residents and businesses have taken advantage of the District's grant programs to purchase zero emission vehicles, install electric vehicle charging stations, and replace older diesel-fueled equipment with new lower-emitting equipment. In 2018, the District tightened its rules on emissions of nitrogen oxides (NO_x), a primary contributor to the formation of ozone, from boilers and cement kilns. In response to this, three of the largest facilities in the District installed additional emission controls, estimated to have resulted in hundreds of tons per year of NO_x reductions.

While this milestone is commendable, the District still has work to do to officially be in attainment with the Ozone NAAQS. Multiple years of not more than one exceedance are required to officially be in compliance with the NAAQS, and the current deadline for the District to meet attainment is 2027.

By: Sam Johnson, Air Quality Engineer

Board of Directors

Michael Davies, Chairman (Councilman, Tehachapi)
Zack Scrivner, Vice-Chair (KC 2nd District Supervisor)
Phillip Peters (KC 1st District Supervisor)
Kyle Blades (Councilman, Ridgecrest)
Jim Creighton (Councilman, California City)

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
Benjamin Dewell
Brett Moseley
Brenton Smith

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

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