



Fireplace Safety

With the increase of time spent at home during the winter months (especially with the current COVID-19 health crisis), many Kern County residents will be gathering around the fireplace for warmth and the sweet smell of burning wood. But do you know what makes it smell so sweet? Wood smoke contains a complex mixture of particulate matter, volatile organic compounds, carbon monoxide, and toxics such as benzene, toluene, and aldehyde gases.

In addition to fire risk, people are potentially exposing themselves to fine particulate matter pollution if they heat their home with wood. Smoke can be released inside the home from the stove, and studies show that an estimated 70 percent of smoke emitted from chimneys can re-enter the home and other neighborhood dwellings. Numerous scientific studies have linked particulate matter pollution to a variety of health problems.

So, what can be done to reduce pollution from wood burning devices? People who heat with wood burning devices should do so as cleanly as possible. Maintain a hot fire, and never burn household waste in your fireplace. Old, inefficient fireplaces and woodstoves should be replaced with a new device or retrofitted with an EPA certified insert; this can reduce particulate and toxic air pollution by up to 70 percent. Homeowners can further reduce health risks by switching to a pellet stove or by burning a cleaner fuel, such as natural gas or propane.

Below are some additional tips for reducing the health risks from a wood burning stove:



1. Keep a fire extinguisher on hand.
2. Install carbon monoxide detectors and smoke detectors in your house—near your wood fireplaces as well as in bedroom areas.
3. Watch for soot buildup in the chimney of your wood burning fireplace. The National Fire Protection Association recommends that chimneys be swept at least once a year at the beginning of the winter to remove soot and debris.
4. Inspect chimney cap regularly and replace when needed.
5. Consider installing a stainless-steel liner that will withstand even the highest temperatures and will keep the fire and its embers contained.
6. Be certain the damper of flue is open before starting a fire. Keeping the damper or flue open until the fire is out will draw smoke out of the house. The damper can be checked by looking up into the chimney with a flashlight or mirror.
7. Burn firewood and **only** firewood! Crates, lumber, construction scraps, painted wood, or other treated wood releases chemicals into your home.
8. If possible, burn hardwoods like maple, oak, ash, and birch. The advantages of hard wood are that they burn hot and long; have less pitch and sap, making them cleaner to handle; and tend to cause less creosote buildup.
9. To burn a fire safely, build it slowly, adding more wood as it heats. Keep the damper of your wood fireplace completely open to increase draw in the early stages. Burn the fire hot, at least occasionally—with the damper all the way open to help prevent smoke from lingering in the fireplace and creosote from developing.
10. Never leave a fire in the fireplace unattended. Make sure it is completely out before going to bed or leaving the house.
11. Allow ashes to cool fully before you dispose them, and it's best to leave them in your fireplace until the following morning if you've enjoyed a fire the night before.

By: Sam Johnson

The **Wood Smoke Reduction Program (WSRP)** offers incentive funds to promote the voluntary replacement of older high-emitting wood-burning stoves and fireplaces with new cleaner, more efficient in-home heating devices. The District's WSRP was originally established in 2018; through California Climate Investments (CCI) funding made available by Senate Bill 563. The CCI is a statewide program that puts cap-and-trade dollars to work by reducing greenhouse gas emissions, strengthening the economy, and improving the environment and public health, particularly in disadvantaged and low-income communities.

Pursuant to SB 563, the WSRP was initially designed to be a two-year program. CCI funds were allocated accordingly. However, due to the popularity and success of the program, the District was able to budget funds to continue the program for a third year. Over \$200,000 in WSRP vouchers have been awarded to approximately 81 Eastern Kern residence to date. The WSRP is currently oversubscribed but the District plans to continue budgeting annual funds to keep the program going. The application period begins October 1st of each year. Vouchers are allocated to eligible applicants on a first-apply first-award basis until all annual funds are awarded. WSRP guidelines and applications can be obtained from the District's website www.kernair.org.

By: Jeremiah Cravens

CANNABIS: Odor Mitigation Part 4 of 4

As of November 3, 2020, four more states voted to legalize adult-use marijuana. This means 14 states have now legalized recreational marijuana, while 36 total states have some form of legalized medical marijuana. Furthermore, American support for national cannabis legalization has also reached an all-time high of 68% according to a recent Gallup poll. According to the LA Times, California is now the largest legal cannabis market in the world with approximately \$3 billion in licensed cannabis sales in 2019. Closer to home, in Eastern Kern County, the legalization of commercial production of cannabis has created a boom of new industrial-scale cannabis cultivation and extraction facilities located in California City. As we mentioned in the last edition of Desert Breeze, the commercial cannabis industry, including cultivation and oil extraction, affects air quality via the release of Volatile Organic Compounds or VOC. For cultivation facilities, the natural growth of plants emits terpenes, which are classified as VOC and responsible for the plant's strong odor. At manufacturing facilities, the evaporation of solvents like ethanol, propane, and butane during the extraction of cannabis oils results in VOC emissions. VOCs alone do not typically pose a direct threat to human health or the environment, however, they do contribute to ground-level ozone by chemically reacting with nitrogen oxides (NOx) in the presence of sunlight. Ozone is harmful to human health and the United States Environmental Protection Agency (US EPA) has made efforts to control ambient ozone concentrations by establishing the Clean Air Act and National Ambient Air Quality Standards (NAAQS). The District has been designated by EPA as serious non-attainment for the eight-hour ozone NAAQS; see the September 2017 Desert Breeze issue for more information. Therefore, it is extremely important that the cannabis industry reduces VOCs emissions in their processes. In this edition of Desert Breeze we will discuss commonly used technologies and best management practices to reduce VOC emissions from the cannabis industry and improve air quality.

Carbon Filtration: is currently the most widely used control technology for reducing VOC emissions from cannabis cultivation and manufacturing facilities. Carbon filters are simple to install, inexpensive, effective, and reliable when properly maintained according to manufacturer specifications. These types of filters are also very versatile and can be installed as stand-alone fan/filter units or can be integrated into existing HVAC systems. Carbon filters work by using adsorption, where porous carbon surfaces chemically attract

and trap VOCs along with other gas contaminants. Carbon filters are known to remove anywhere from 50% - 99% of VOCs depending on VOC type and filter age. As the filter ages, less carbon surface area is available to trap VOCs; at this point the filter will need to be replaced. Manufacturers recommend filters be replaced every 6 to 12 months depending on the load. Additionally, these filters need to be properly sized according to space size and airflow requirements. If you exceed this max flow rate, the passing air will not have enough "contact time" with the carbon, and the filter will not be effective at removing VOCs. A typical marijuana grow operation usually requires multiple filters.

Odor neutralizers: are plant derived oils or liquids used to neutralize odorous VOCs via absorption. Here, the odor neutralizer liquid is sprayed into exhaust air at cultivation facilities using a misting or fogging system. The neutralizers mist then works by physically trapping and dissolving the targeted compound. The main drawback of odor neutralizers is that the effectiveness of VOC reduction varies greatly from (20%-90%) depending on product type and contact time. A scentometer or Nasal Ranger is a useful tool to quantify odors, which can be used as a starting point to determine if a particular operation is meeting operational conditions and if additional neutralizer is required. **Also, it is important to note that cannabis odors beyond the property line are considered a public nuisance and a violation of permitted conditions, be sure to contact the District if you can smell odors near a commercial cannabis facility.**



Ozone generators: use Ultraviolet light to create ozone and are often advertised as air cleaners/purifiers for residential and small commercial areas. These generators use UV light to split oxygen molecules (O₂), creating single O molecules. These O molecules can then attach to background O₂ creating O₃ or ozone. Ozone generators have been proven effective for killing bacteria, viruses, and eliminating odors in controlled industrial settings. However, unreacted ozone from these generators is a direct emission source of air pollution, harmful for humans, and responsible for damaging crops. The California Air Resources Board (CARB) strongly advises against the use of ozone generators in spaces occupied by people or animals. Therefore, ozone generators are not recommended as a best practice for odor control in cannabis facilities. As the cannabis industry continues to evolve, new control technology may be developed to meet air quality needs.

Masking/counteractive agents: are similar to odor neutralizers in that they are also chemical odor substances sprayed into the exhaust air. However, the use of these agents are often only useful for masking cannabis odors and offer no actual control of VOC emissions. Really, these substances are made up of odorous VOCs themselves which results in higher VOCs associated with this technology. This leads to a higher air quality impact and are not recommended by the District as a pure VOC control.



By: Miguel Sandoval

WILDFIRES

The most prevalent natural disaster in California are wildfires. In 2020 alone, nearly 4.5 million acres of land in California have burned making it the largest wildfire season in modern California history. Wildfires have been happening on Earth since terrestrial plants have been around. Wildfires in the past have promoted healthy regeneration of vegetation and ecosystems but now as human development encroaches on some of these wildlands it presents a high fire risk to humans. Not only do they pose an immediate threat to human life and property but prolonged exposure to wildfire smoke can become an irritant to everyone who continues to breathe it in.

To understand how any fire begins you need to know how fires are started. Fires need three things to start: an igniter, a combustible fuel, and oxygen. An igniter can be anything from a lit cigarette to a lightning strike. The most common human causes of wildfires are arson, improper cigarette disposal, power-lines, and sparks from things like landscaping equipment as well as cars/trucks. The most common natural causes of wildfires are dry climate, lightning and volcanic eruptions. Combustible fuel can be any type of dry vegetation (grasses, tumbleweed, etc.), dead trees or anything that is flammable. Dead trees are a common fuel in California due to the drought conditions the State has suffered for many years. Bark beetle infestation have intensified the issue by feeding on distressed trees. By overtaking the tree, the beetles will kill the tree and in the end, cause the tree to dry out and become fuel. Wildfires in California usually happen when the temperatures are high, the humidity is low (no moisture in the air) and the winds are blowing. High winds allow fires to continue to spread.

Once a wildfire has begun, firefighters use different methods to suppress the fire. More commonly, water and fire retardants are dropped on the fire using helicopters and planes if they are in areas that are unreachable. Fire retardants are chemicals that inhibit combustion and therefore will slow or stop a wildfire. As a fire burns and even as it smolders, smoke emits into the ambient air and depending on wind directions, will

disperse in different areas. The smoke reduces visibility while it is entrained in the air. This smoke is very harmful as it contains different air pollutants. Smoke contains gaseous pollutants (NO_x, SO_x, CO, CO₂, VOCs, etc.) as well as particulate matter (PM₁₀ and PM_{2.5}). Approximately 80-90% of smoke is PM_{2.5} by weight. PM_{2.5} is particulate matter that is 2.5 micrometers or less in diameter. PM_{2.5} is so small, it can be inhaled and deposited in our lungs. Inhalation of PM_{2.5} can cause problems breathing, coughing, sinus issues, eye irritation as well as intensify the effects of heart or lung disease. Carbon dioxide and carbon monoxide are present in smoke as well. The amounts of carbon monoxide (CO) in smoke can be harmful to humans. In high concentrations in an enclosed space or close to the source of the fire it can cause death, but inhaled from the ambient air it may cause chest pain and reduced oxygen to the heart. The pollutant ozone is also formed indirectly when wildfires burn. Ozone pollution is known to cause cardiopulmonary issues and respiratory irritation.

How do we prevent wildfires? By following hazard reduction protocols from your local fire agency, you can help reduce dry combustible fuels. Fire agencies also do prescribed burns in areas where dry material has accumulated in the wild. Prescribed burns are controlled burns of dry fuels that help turnover the ecosystem in the area and promote growth of new vegetation. By being mindful of any potential hazards and reporting hazards to the appropriate agency, such as power lines being encroached by tree branches, you can help prevent a fire. If a wildfire is causing smoke in your local area, stay inside as much as possible to avoid breathing in the outside air. Do not use a swamp cooler to cool down because it may allow smoke to enter the home, but a central air conditioning unit can be used as it recycles the air in your home instead of pulling air from the outside. Unfortunately, the dry conditions in California are a reason wildfires happen seasonally, but by doing our part in reducing dry fuels, we can save lives and the air we breathe.

By: Nicole Dickerson



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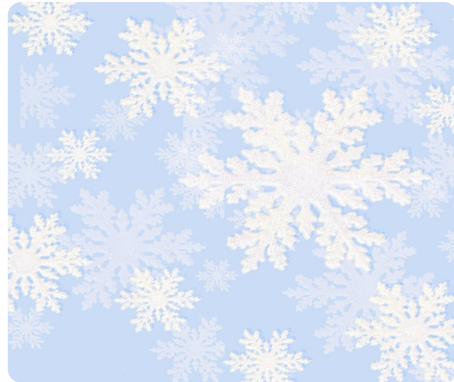
Board of Directors usually meet once every two months starting in January. The location, along with the Meeting Agenda, can be located on the District website www.kernair.org, under the “Board” tab.

Air Pollution Control Officer

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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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