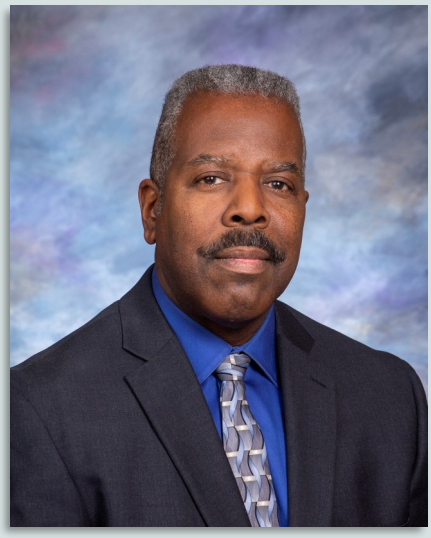
DESERT BREEZE

VOLUME XII ISSUE I MARCH 2024

FAREWELL

I started with the Kern County Air Pollution Control District on December 3, 1990. I wasn't planning on staying in Kern County more than 5-years, but life happened. It wasn't the life I planned, but it was better than I planned. I've had the opportunity to touch lives, make lives better, and make changes for the better. However, after 33-years of air quality work, I have been reflecting on the lives that touched me, family (mother, father, and brothers {I have no sisters}), friends, coworkers, predecessors, and others. I'm reminded of Steve Beyn (passed away in 2020). We worked together many years before he retired in 2005. He called me, after he read I had become the Air Pollution Control Officer (APCO) for the Eastern Kern Air Pollution Control District (District). Steve congratulated me on the promotion and told me: Not to change. Continue being the person I am, and I'll be fine. I never expected that call, but I took those words to heart. I tried to leave "the place" a little better than I found it. Unfortunately, I don't have 17-pages to mention by name everyone that has touched my life; however, because this is the District's newsletter I will thank by name the following: Zack Scrivner, Michael Davies, Jim Creighton, Kyle Blades, Phillip Peters, Trish Ferdon, Dee Foots, Melissa Atkerson, Heather Handy, Nicole Valentine, Katie Lantz, Miguel Sandoval Ortega, Sam Johnson, Jeremiah Cravens, and my replacement, Gary Ray.

Overall, I have enjoyed my air quality career. My good days outnumbered my bad days; therefore, I won't complain. I can't think of something clever to say; therefore, I'll recycle a couple of my favorites: "Peace, Live Long and Prosper."… Stephens Out.



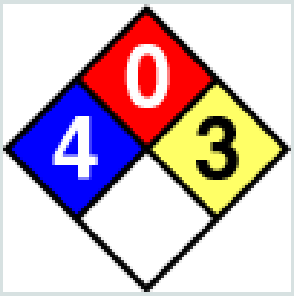
Glen Stephens, Retired Air Pollution Control Officer

Memory Lane

Pollutant of the Quarter:

CHLOROPICRIN

Chloropicrin, also known as PS and Nitrochloroform, is a chemical compound that is used as a broad-spectrum antimicrobial, fungicide, herbicide, insecticide, and nematicide. It can also be used as a disinfectant for cereals and grains. Chloropicrin is a dense, colorless to pale yellow liquid with a chemical formula of CCl_3NO_2 and decomposes when heated to or above 234 degrees Fahrenheit. The chemical has a very low odor threshold and causes sensory irritation at very low concentrations. The vapors are heavier than air and will spread along the ground and collect in areas that are poorly ventilated.



The chemical is injected into soil prior to planting a crop to fumigate the soil and is commonly used for strawberry crop production. Before the use of Chloropicrin as a pesticide, it was used as a chemical warfare agent and riot control agent because inhalation of the chemical produces similar characteristics to tear gas. It was heavily used during World War I and was stockpiled during World War II, however it is no longer authorized for military use.

Although it is not a carcinogenic, Chloropicrin is a highly hazardous chemical and can cause irritation with limited contact. Chloropicrin can contaminate water, food, and the air. Effects can take effect through inhalation, ingestion, and skin contact. With a lower concentration of chloropicrin, inhalation causes severe sensory irritations in upper respiratory passages including cough, bronchitis, and pulmonary edema. With higher or prolonged exposure, dyspnea, cyanosis, and weakness can develop. The liquid form of chloropicrin causes irritation and burns the skin while ingestion of chloropicrin causes severe irritation of the mouth and stomach, diarrhea, severe vomiting, and nausea.

Because Chloropicrin is used in agricultural operations, its use must be registered and approved by Agricultural (Ag) Commissioners throughout California, including the Kern County Ag Commissioner. The California Air Resources Board (CARB) has listed Chloropicrin as a substance for which emissions must be quantified and reported through the AB 2588 Air Toxics "Hot spots" program. The Eastern Kern Air Pollution Control District (District) has been mandated to assess hazardous emissions including Chloropicrin from regulated industrial sources within our jurisdiction through the AB 2588 program. For more information on AB 2588 see the December 2018 Desert Breeze article on cancer and air pollution.

By: Katharine Lantz Air Quality Specialist

Landfills: Intakes & Collections

Have you ever wondered what happens to your trash once it's picked up? It goes to your local landfill. A landfill is a disposal facility or location where disposal of waste occurs. Everyday community waste is taken to Municipal solid waste landfills. Some landfills are designated to accept "special" waste such as construction waste and hazardous waste (biowaste, asbestos, etc..).

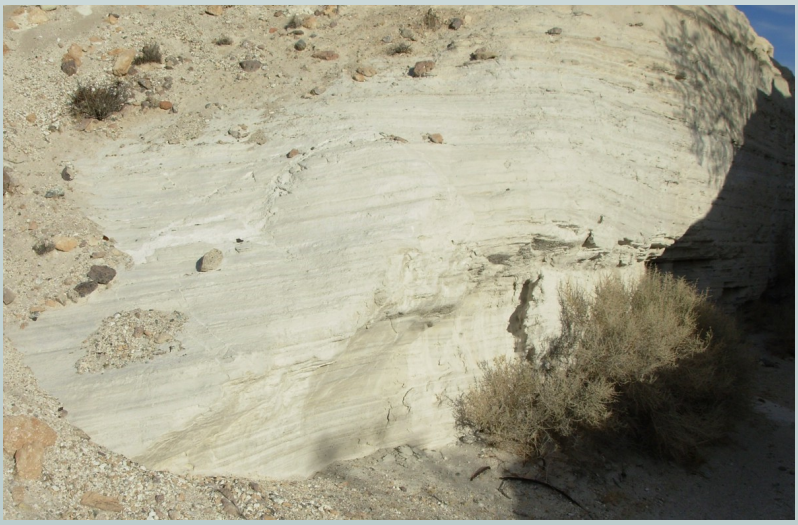
Most communities have their trash picked up once a week by their designated waste collection company. On average, a single garbage truck can service between 800-850 homes and hold 12 to 14 tons of waste. Disposal of garbage collected is done through compression and filling of waste in designated cells. Landfills are typically constructed on large pieces of land. Open areas of the landfills are designated and ready to accept incoming waste. These open areas are called cells or modules; they are created one at a time. Each cell is lined with a protectant layer (clay, plastic liner, etc...) prior to accepting waste. This is done to help protect the surrounding environment from direct contact with the waste. Cells can be constructed at the surface layer of the landfill or can be dug deep; this depends on the geographic limitations of the landfill. Once a cell is created, garbage trucks directly empty their collected waste into the cell and the garbage is compacted. At the end of day, workers at the landfill cover the collected waste with a layer of dirt or a plastic sheet to minimize litter, odors, and accumulation of pests. Landfill cells are designed to last for long periods of time and are monitored by state and local agencies.

By: Melissa Atkerson, Air Quality Specialist

Pozzolan Cement

What is Pozzolan?
Pozzolans are a broad class of siliceous and aluminous materials. The general definition of a pozzolan embraces a large number of materials that vary widely in terms of origin, composition, and properties. Pozzolans possess little to no cementitious value alone. However, in finely divided form and in the presence of moisture, a pozzolan will chemically react with calcium hydroxide (Ca(OH)2) at ordinary temperatures to form compounds possessing cementitious properties. There are both natural (burnt clay, pumicite, diatomaceous Earth) and artificially manufactured (fly ash, silica fume, rice husk, blast furnace slag) pozzolan materials used as supplementary cementitious materials. Descriptions of the various kinds of pozzolans and their specifications are listed in the American Society for Testing and Materials (ASTM) C618 and C1240.

Manufacturing Process
Portland Pozzolan Cement (Pozzolana) is produced through a complex manufacturing process. The first step is to quarry the principal raw materials, mainly limestone and clay, along with other secondary materials. Compound compositions will vary slightly from one cement production facility to another but all of them begin by extracting limestone and clay from quarries, which manufacturers subsequently crush and homogenize in several stages to form a consistent mixture.



The raw materials are heated in a kiln at extremely high temperatures. The intense heat transforms the calcium carbonate in the limestone into calcium oxide, releasing carbon dioxide gas. At the same time, the clay minerals react to form new compounds. The resulting material, called clinker, consists of small, grayish-black nodules ranging in size from a few millimeters to a few centimeters. Clinker is then cooled by a rotary cooler. Gypsum and either natural or artificially manufactured pozzolan is added to the clinker and pulverized into a finished powder known as Pozzolana.

Advantages of Pozzolana
The pozzolan materials used in Pozzolana are very fine. This allows them to fill gaps between reinforcements and aggregate, thus reducing shrinkage, honeycomb formation, and bleeding, which increases the strength and durability of the concrete. Pozzolana is often used in pre-stressed and post-tensioned concrete members because of this quality. Pozzolana also provides very good resistance against sulphate attack, which proves to be suitable for hydraulic and marine structures, construction near the seashore, and dam construction. Additionally, Pozzolana is considered an eco-friendly cement because the pozzolan materials used in manufacturing are generally less expensive and sometimes considered a recycled or waste product. Lastly, since pozzolan can substitute a proportion of clinker and requires less heat to process, Pozzolana is considered to have a reduced carbon footprint.

Disadvantages of Pozzolana
The extremely fine materials in Pozzolana can make it more difficult to handle and therefore must be used in controlled settings. The strength of Pozzolana gains slowly and makes the curing process very important, as any error could affect long-term durability. Additionally, since its initial strength is less than that of Portland cement, there could be issues when de-shuttering supports. Lastly, Pozzolana's lower alkalinity content makes it less resistant to corrosion of steel reinforcements.

Additional cement articles can be found in the following Desert Breeze issues: March 2014 (Volume II, Issue I); March 2016 (Volume IV, Issue I); June 2016 (Volume IV, Issue II); and September 2016 (Volume IV, Issue III).

By: Jeremiah Cravens, Air Quality Specialist

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Phillip Peters (KC 1st District Supervisor)
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Board of Directors 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

Gary Ray, Jr.

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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