Eastern Kern County

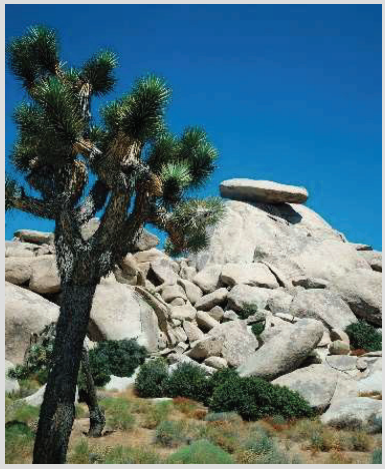
Air Pollution Control District

2022-2023

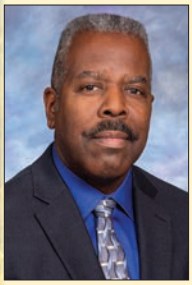
Information Report








A message from the AIR POLLUTION CONTROL OFFICER



On behalf of the Eastern Kern Air Pollution Control District (District) Board of Directors and the District Staff, it is my pleasure to present the District's 2022-2023 Report (our third report). The District is one of thirty-five local air districts in California responsible for stationary source permitting, regional air quality planning, and air monitoring. We also partner with the California Air Resources Board (CARB) to administer air quality improvement grant programs in efforts to ensure all Californians breathe clean air.

The District (originally the Kern County Air Pollution Control District {APCD}) was formed by the Kern County Board of Supervisors in March 1968. In the beginning, the District encompassed all of Kern County. However, in 1992 when the Kern County APCD was downsized, through State legislation (SB 124 by Sen. McCorquodale), the Valley portion of the county became part of the newly formed San Joaquin Valley Unified APCD (later renamed San Joaquin Valley APCD). The remaining portion was then resized to Kern County APCD. After the initial downsizing, there was a boundary change that increased the District size. In 2010, Kern County APCD was renamed the Eastern Kern APCD (the name we use today). We are one of the few air districts in California that is a portion of a whole county.

The District jurisdiction is a unique area, with diverse geography and sources. Because of our diversity, we have unique sources. We are one of two air districts that are home to three cement plants (not to be confused with concrete plants). More about cement can be found in our Desert Breeze articles from March 2016 through September 2016 (*www.kernir.org*). Additionally, we are home to two military bases (Edwards Air Force Base {EAFB} and Naval Air Weapons Station) responsible for research and development of military equipment. Additionally, EAFB is home to NASA Armstrong Flight Research Center; a previous backup landing site for the space shuttle, and transport (to Florida) site for space shuttles manufactured in Palmdale, California. Because of the arid conditions of the southwest desert of the District, it is an ideal storage location for unused aircraft at the Mojave Air and Space Port (located in Mojave). Coincidently, the Mojave Air and Space Port is the launch and landing site of Voyager (first aircraft to fly around the world without stopping or refueling) and construction and launch site of SpaceShipOne (an experimental air-launched rocket-powered aircraft with sub-orbital spaceflight capability at speeds of up to 2,000 mph). It is hard to believe that launch was 20-years ago.

We are also home to Lake Isabella and portions of the Kern River that highlight exciting water sports. Additionally, the District contains scenic landscape used in photos and movies.

However, as an air district we are most interested in the air quality in our District, to assure we can see and enjoy our unique area. Our air quality has continued to improve; although our challenges to lower emissions is compounded because of the 85% reductions we have generated over the past thirty years. This is truly an exciting time for us. Same mission: "…to improve air quality…" and new challenges to achieve our goal.

Glen E. Stephens, P.E.
Air Pollution Control Officer

Governing **Board**

Zack Scrivner
District II Supervisor

Phillip Peters
District I Supervisor

Kyle Blades
City Council, Ridgecrest

Jim Creighton
City Council, California City

Michael Davies
City Council, Tehachapi

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About the **District**

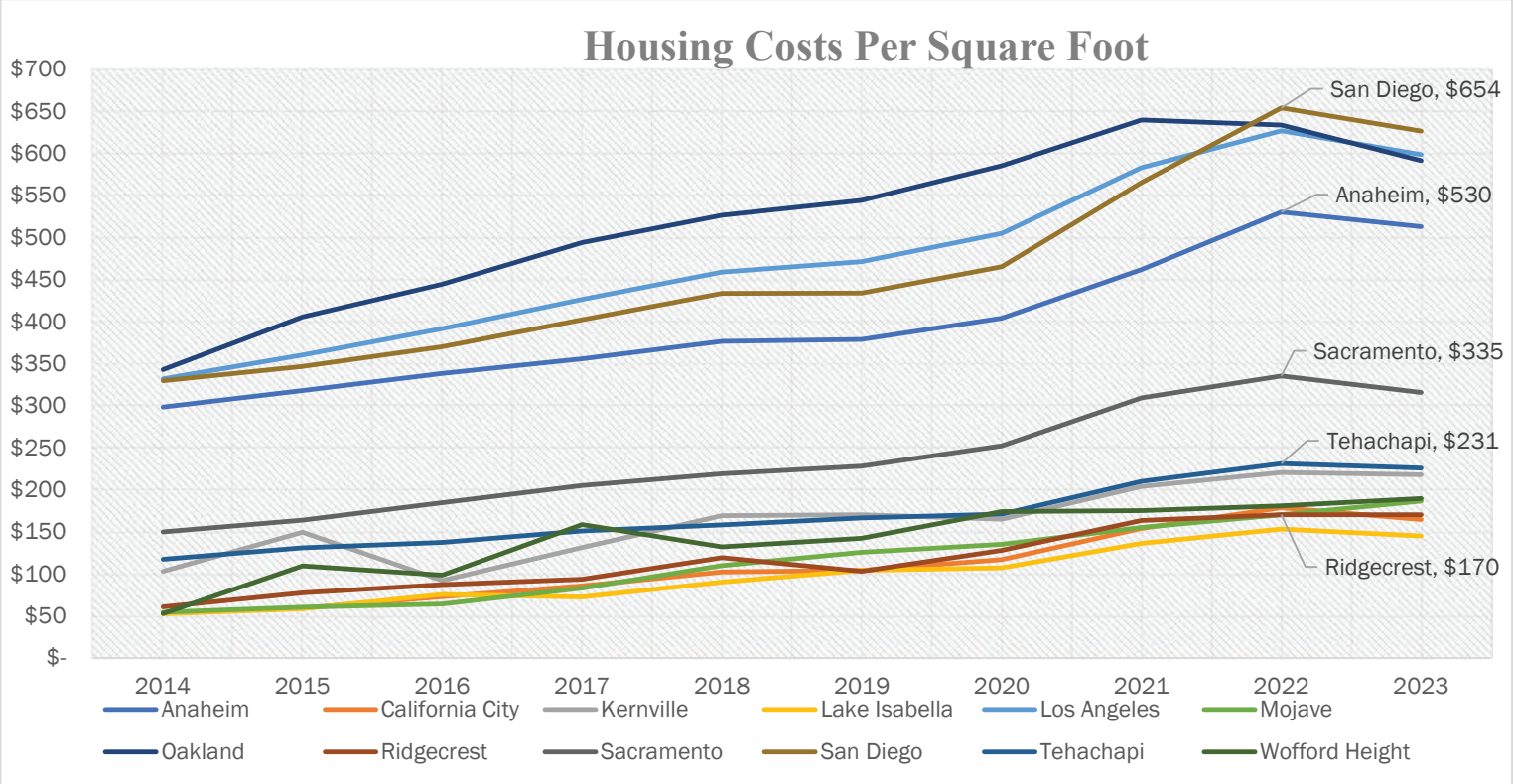
The District is located in the western edge of the Mojave Desert and includes approximately 3,700 square miles of the eastern half of Kern County. This region contains a unique mix of geography, topography, and meteorology separated from heavily populated valleys and coastal areas to the west and by several mountain ranges to the south. The climate is very dry and arid with little rainfall. Temperatures can exceed 100° Fahrenheit, sixty to seventy days per year.

Although the District is primarily rural with a relatively low population of 174,000 compared to its size, it is classified as a medium district due to its vast industry and number of large area sources.

Housing

The housing market within the District boundary has noticeably affordable housing rates compared to other parts in the state. According to 2022 data from Redfin.com, the Tehachapi housing market shows an average of $231 per square foot ($ft^2$), while Ridgecrest and Mojave are approximately $170 ft^2. The rates in other major cities in California are double or sometimes triple the rates found in the District; Anaheim ($530 ft^2), Los Angeles ($627 ft^2) San Diego ($654 ft^2), and Oakland ($633 ft^2).

The Covid-19 pandemic caused a building supply shortage which triggered a nationwide increase of home prices, which prompted low mortgage interest rates which influenced buyers and caused a housing "boom". Now in 2023, the U.S. is experiencing inflation and facing an increase in the national debt ceiling, which influenced interest rate hikes and has slowed home sales. According to Redfin.com, as of May 2023, the national average of interest rates for a 30-year fixed mortgage has reached 7.12%, compared to the average low rates of 2.7% in 2021.



Outdoor Activities in Eastern Kern County

Eastern Kern County illustrates the incredibly varied geography that California is known for. There are opportunities to explore the Sierra Nevada Mountain Range, the Kern River, and the Mojave Desert. The mountain communities offer various outdoor activities popular during spring and summer seasons. Locals and tourists can enjoy an array of hikes, bike paths, fishing, camping, snow activities and rock climbing. With twenty-three scenic trails, the Kern River Valley is home to the annual "Keysville Classic" which is one the longest running mountain bike race.

One of the biggest attractions of Eastern Kern County is the Kern River. Designated as a "Wild and Scenic" river under the Wild and Scenic Rivers Act, the Kern River is famous for its whitewater. Its roaring rapids offers adventures for rafting, kayaking, canoeing, and tubing. Kernville has various professional outdoor activity agencies to guide a safe adventure on the Kern River.

The Alta Sierra Ski Resort provides snow activities for the winter months. Located twenty-five minutes away from Wofford Heights, the ski resort offers skiing, snowboarding, sledding, and snow tubing. They provide a ski lift, equipment rentals and lessons. There is also nearby lodging for multi-day trips.

The Kern River flows into the Lake Isabella reservoir. Lake Isabella provides activities such as fishing, boating, water sports, camping, and picnicking. Windsurfing can also be enjoyed on the lake due to the areas notorious winds. Lake Isabella hosts various events throughout the year including a firework show for the Fourth of July, canoeing/kayaking classes, and fishing derbies.

On the eastern side of the Sierras is the Mojave Desert. The desert communities have plenty of adventures to offer. In Jawbone Canyon, visitors can rent motorized vehicles (ATVs, dirt bikes, etc...) to ride on designated trails. Red Rock Canyon State Park offers hikes on trails through the large rock formations and camping for night stargazing. In the small town of Randsburg, visitors can explore an old ghost town with authentic historical structures and small antique shops.

Filmed in Eastern Kern County

The wide array of landscapes of Eastern Kern County provides unique settings for some major Hollywood films and TV Productions.

RED ROCK CANYON, CANTIL – Ghostbusters: Afterlife – starring Carrie Coon, Paul Rudd, Finn Wolfard, and Mckenna Grace. IMDb lists Redrock Canyon, Cantil as a filming location for this comedic, fantasy movie that hit the big screen in 2021.

MOJAVE DESERT – MythBusters: Escape Slide Parachute – Adam Savage and Jamie Hyneman test the parachute qualities of airline evacuation equipment in the Mojave Desert.

EDWARDS AIR FORCE BASE – Captain Marvel – starring Brie Larson and Samuel L. Jackson – portions of the movie were filmed at Edwards Air Force Base. Hangar 1600, the ramp just outside of it, and the EAFB Tower can be seen in the movie. Brie Larson's character, Carol Danvers can be seen wearing EAFB patches on her uniform, including a patch from the Air Force Test Center.

NAWS CHINA LAKE – Top Gun: Maverick – starring Tom Cruise, Miles Teller, and Jennifer Connelly was filmed at Naval Air Weapons Station China Lake in Ridgecrest, California. In a scene featuring Ed Harris standing his ground as an F-18 flew overhead, the roof was blown off the guard station. This was an unplanned consequence of the scene.

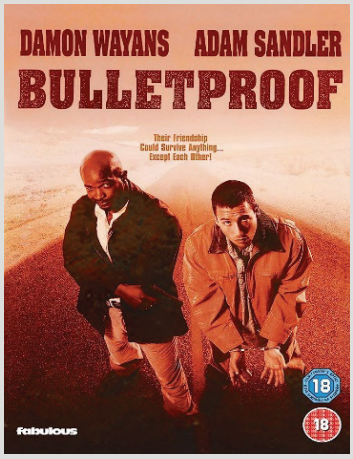
CALIFORNIA CITY – 9-1-1 - starring Angela Bassett, Peter Krause, Oliver Stark, and Aisha Hinds. IMDb lists California City, California as a filming location for this action-packed TV drama.

ROSAMOND – Iron Man – starring Robert Downey Jr., Gwyneth Paltrow, Terrence Howard, and Jeff Bridges. IMDb lists Rosamond, California as a filming location for this action-packed superhero movie.

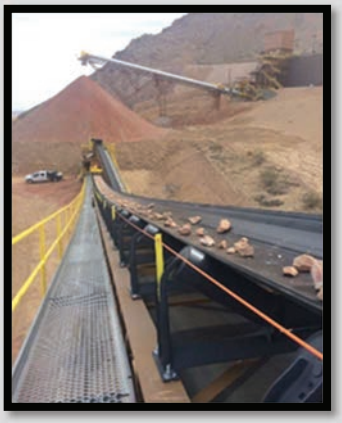
TEHACHAPI – Jurassic Park – starring Sam Neill, Lauren Dern, Jeff Goldblum, and Richard Attenborough. A scene from the Sci-Fi movie was filmed on the Tehachapi Pass.

BORON - Jay Leno's Garage: More Power – starring Jay Leno. Jay Leno heads to the largest borax mine in North America to drive a huge truck.

RIDGECREST - Bulletproof – starring Adam Sandler, Damon Wayans, and James Caan. Scenes from this comedy were filmed in Ridgecrest, California.



Sources of **Pollution**



INDUSTRIES

Mining and Cement Industries

The mining industry comprises a source of air pollution emissions for the District. There are currently five mining operations active within the boundaries of the District that include Golden Queen Mining Company in Mojave, U.S. Borax (part of Rio Tinto Group) in Boron, California Portland Cement in Mojave, National Cement in Lebec, and Tehachapi Cement Plant in Tehachapi. The pollutants generated by these facilities are Particulate Matter (PM_{10} and $PM_{2.5}$), Sulfur Oxides (SO_x), Oxides of Nitrogen (NO_x), Carbon Monoxide (CO), Volatile Organic Compounds and other Toxic Air Pollutants. When a permit is issued by the District, the pollutant emissions are controlled by activity rate limitations, requiring equipment used to operate more efficiently, or requiring stricter emission limits to operate.

Commercial Aerospace

The Mojave Air and Space Port is a location where commercial aerospace industries are developing rocket propulsion and testing, aerospace painting/coating, and aircraft fabrication. The permits associated with aerospace encompass aircraft and rocket component material fabrication, rocket and aircraft fuel combustion, and surface coating operations. Since 2007, the District has regulated the testing and propellant combustion of rockets under District Rule 431. The rule requires facilities performing such operations monitor the emissions generated during the testing of rockets, and an approved plan be submitted to the District. The Rocket Test Plan requires the consideration of wind direction and the duration of the rocket burn to ensure emissions do not adversely impact the surrounding community.

Cannabis

The only area currently approved to cultivate and process cannabis within the District's jurisdiction is California City and requires a District Permit to Operate. Dust generated by grading operations and volatile organic compounds (VOCs) are the primary sources of emissions generated from cannabis operations and activities. The VOCs from cannabis growth contributes to ozone creation and the odor generated is a source of nuisance complaints. Facilities are required to control odors through use of carbon filters or other methods. Fugitive dust often is generated during the initial construction phase. Dust generated by grading and construction are required to be controlled to eliminate dust leaving the property boundaries. The District reviews cannabis growth and extraction operations for VOC emissions.

Agricultural Farming

Farming and agricultural operations can have significant emissions. One source of emissions is fugitive dust (PM_{10}- the size of particulate matter that is 10 micrometers or less) generated by plowing operations located throughout the District. Agricultural operations are conducted in the following areas: Rosamond, Tehachapi Valley, Stallion Springs, Kern River Valley, Cummings Valley, Walker Valley, Onyx, and Brite Valley. Farms are required to mitigate and control dust generated from agricultural operations by adhering to a Conservation Management Practices Plan approved by the District. Another source of emissions coming from agricultural operations are internal combustion engines (pumps and electrical generators) and boilers used at agricultural sites. Engines and boilers used at agricultural sites require a permit or registration to set emission limits to minimize emissions. Often odors are generated by agricultural operations during the application of fertilizer and similar operations; however, in accordance with District Rule 420 the generation of odor from an agricultural operation is exempt from the requirements of Rule 419 (Nuisance). On occasion burning of agricultural waste is necessary. The burning of agricultural wastes requires an "Agricultural Burn Permit" be obtained and approved of by the District. Additionally, agricultural burning must be done in compliance with District Rule 417.

Dry Cleaning

In dry cleaning businesses, the District requires a permit for the operation due to the emissions generated from petroleum solvents and perchloroethylene used in the cleaning process. As perchloroethylene and petroleum solvent are known human carcinogens, the sources are required to limit the emissions generated through District approved dry cleaning equipment control measures, and the emissions permitted are calculated based upon the pounds of clothing cleaned.

However, use of perchloroethylene and petroleum solvents are being phased out. The use of carbon dioxide (CO_2) and silicone are alternatives eliminating VOCs and toxic emissions found in perchloroethylene and petroleum solvents.

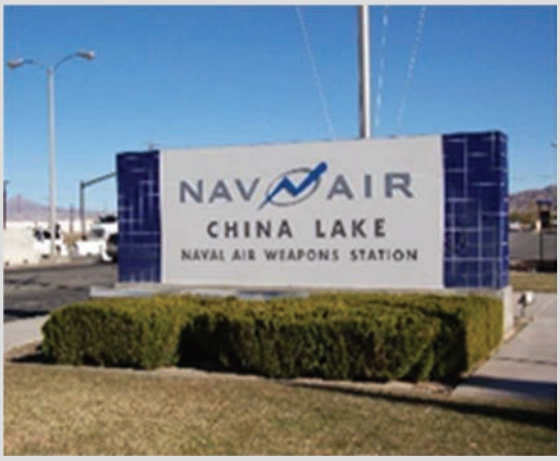
Military Bases

There are two military bases within the jurisdiction of the District – Edwards Air Force Base and Naval Air Weapons Station (NAWS) China Lake.

A majority of Edwards Air Force Base is located in Kern County. It is the home of the Air Force Test Center, Air Force Test Pilot School, and NASA's Armstrong Flight Research Center. It is the Air Force Materiel Command center for conducting and supporting research and development of flight, as well as testing and evaluating aerospace systems from concept to combat. Every aircraft to be placed in the Air Force's inventory has been tested and researched through Edwards.

NAWS China Lake is located in the Western Mojave Desert region of California. The installation is the Navy's largest single landholding, representing 85% of the Navy's land for Research, Development, Testing, and Evaluation (RDT&E) and 38% of the Navy's land holding worldwide.

Both military bases emit criteria and toxic air pollutants and have permits with the District. Some examples of permitted equipment include the following: generators, paint spray booths, fire water pumps, and aviation fuel dispensing systems.

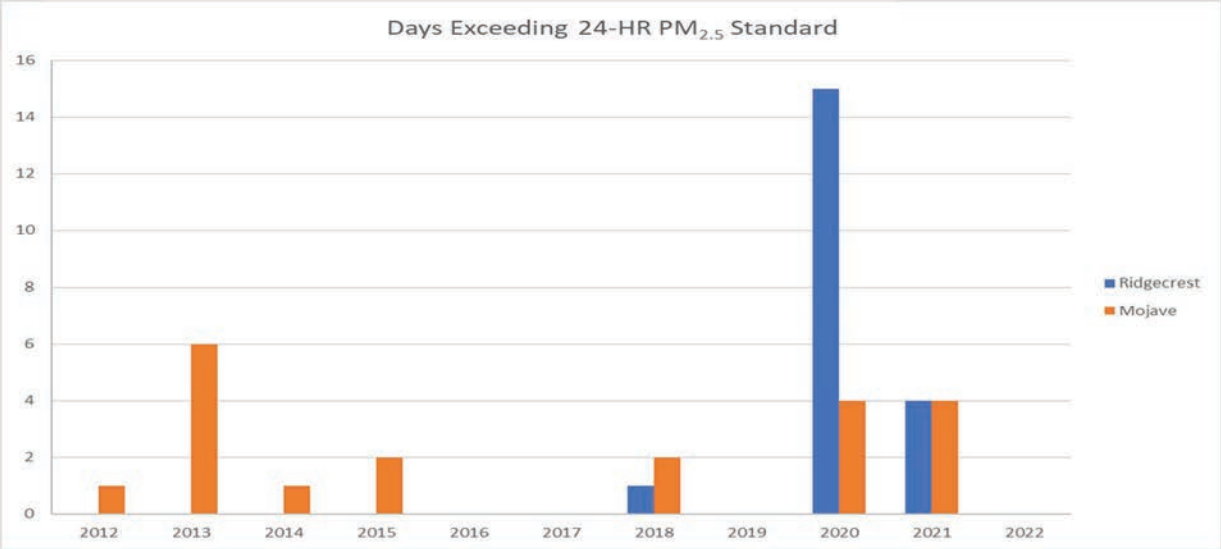


Renewable Energy

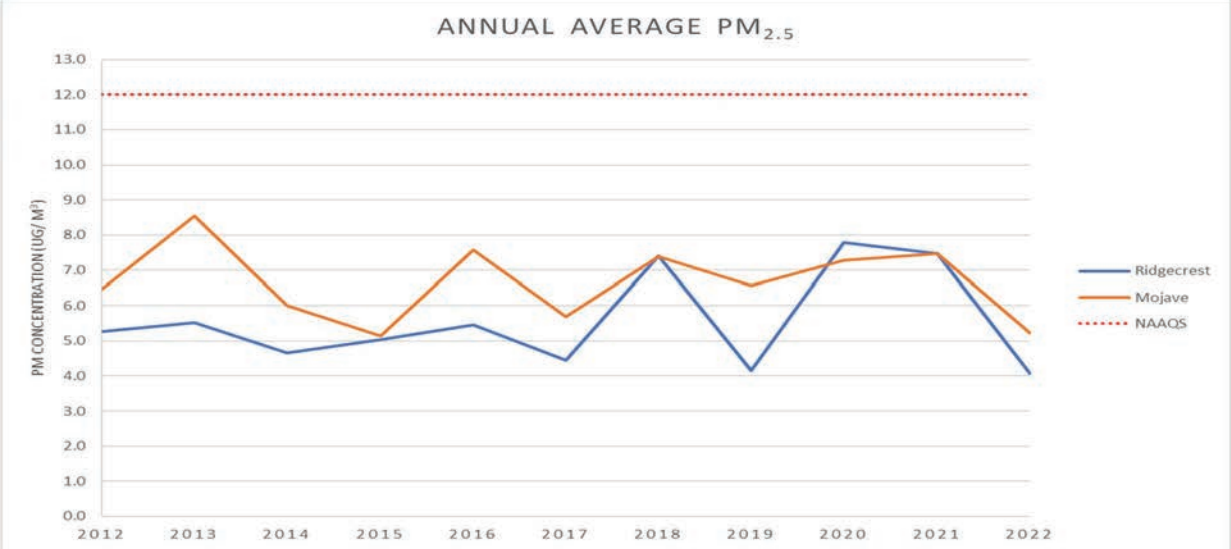
The District is home to three types of renewable energy: wind energy, solar energy, and hydroelectric power. The Southern California Edison Hydroelectric Power Plant uses the energy of the fast-moving Kern River water to generate power in the form of electricity. Tehachapi and Mojave are home to numerous wind turbines that harness the energy of the boisterous winds that sweep the area throughout the year. These turbines generate electricity which is then transferred to the power grid. Solar facilities are a large source of renewable energy in Eastern Kern. As of 2023, there are thirty-eight permitted commercial solar facilities and counting. The District is home to the largest battery storage facility in the world currently with the purpose of storing the energy gathered from the Edwards and Sanborn Solar facilities.

Types of Air **Pollution**

Particulate Matter Trends

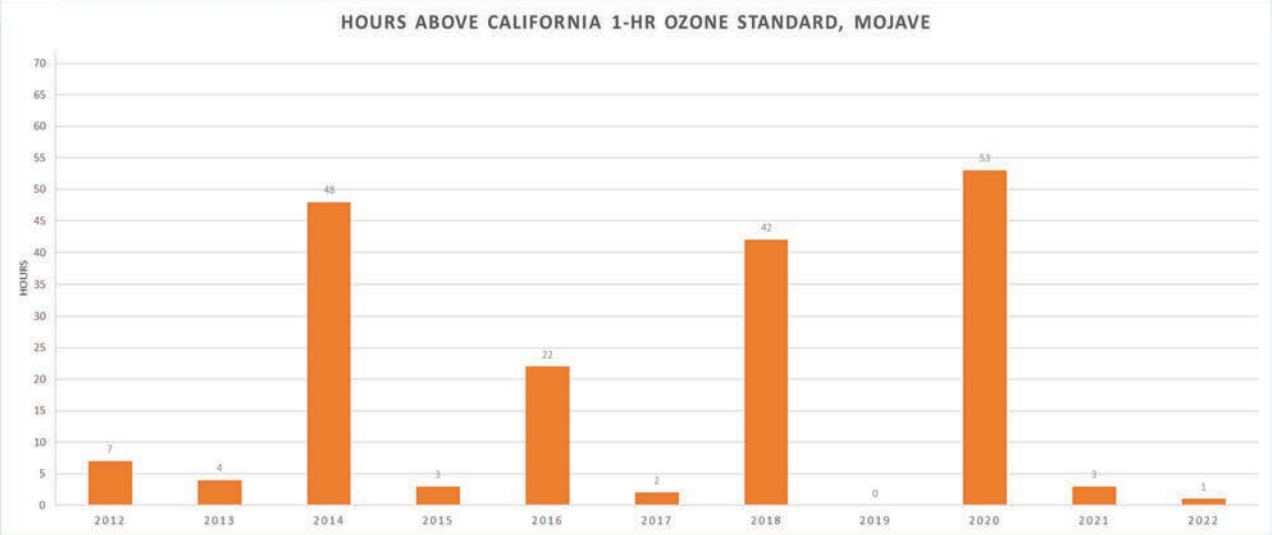


Exceedances in 2020 and 2021 occurred between mid-August and early October, when wildfire smoke was significantly impacting Kern County.

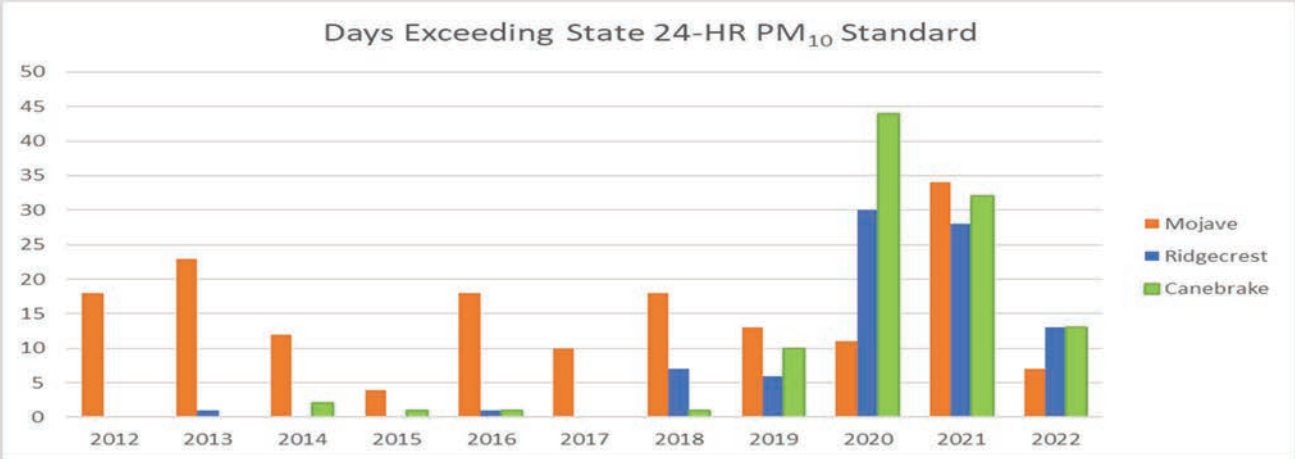


The District installed a continuous monitor in Ridgecrest in 2018 to replace the monitor that ran once every 6 days.

Ozone Trends

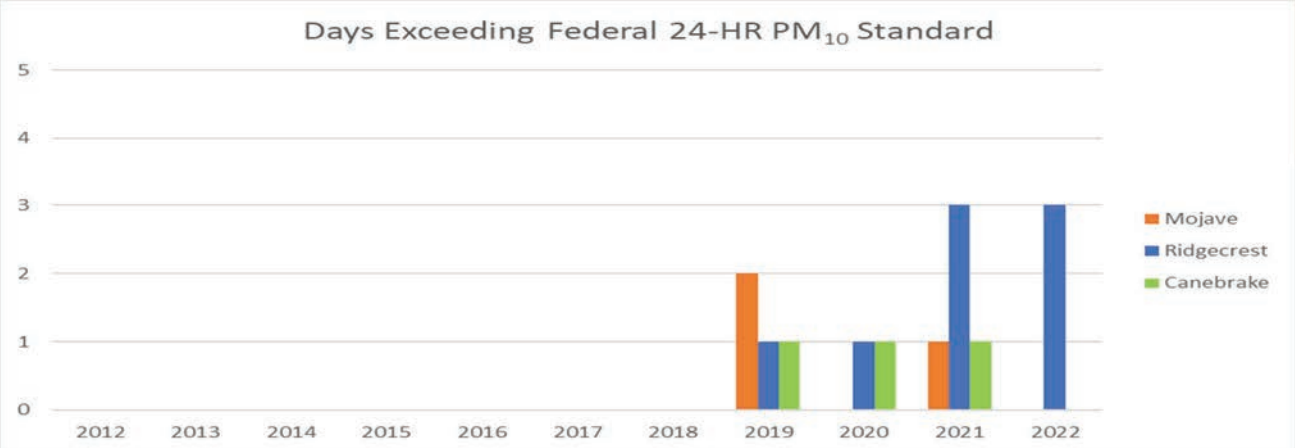


In 2018 and 2020, the District was impacted by transport of ozone precursors into the desert air basin from large wildfires in the Sierra Nevada and North Coast Mountain ranges during the majority of exceedances.

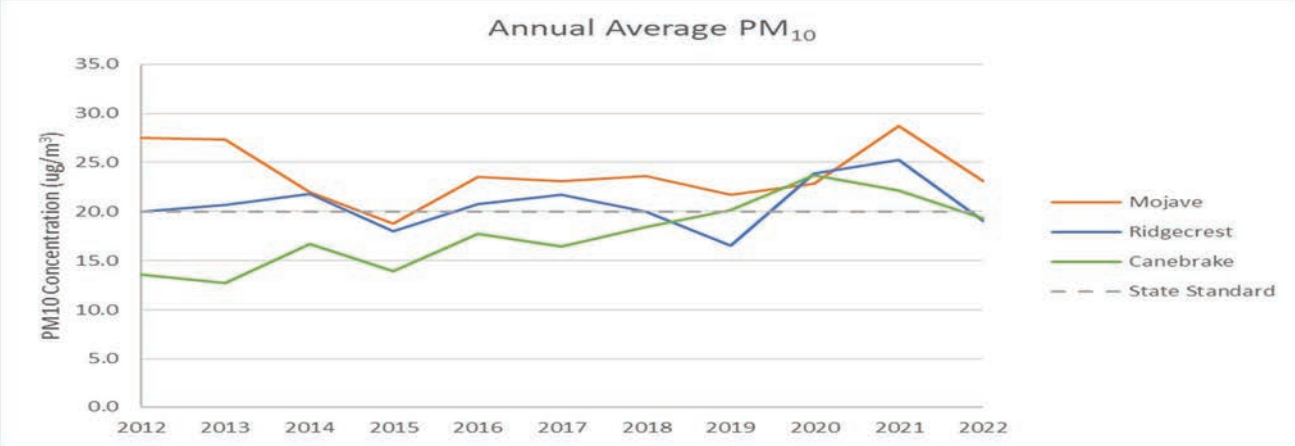


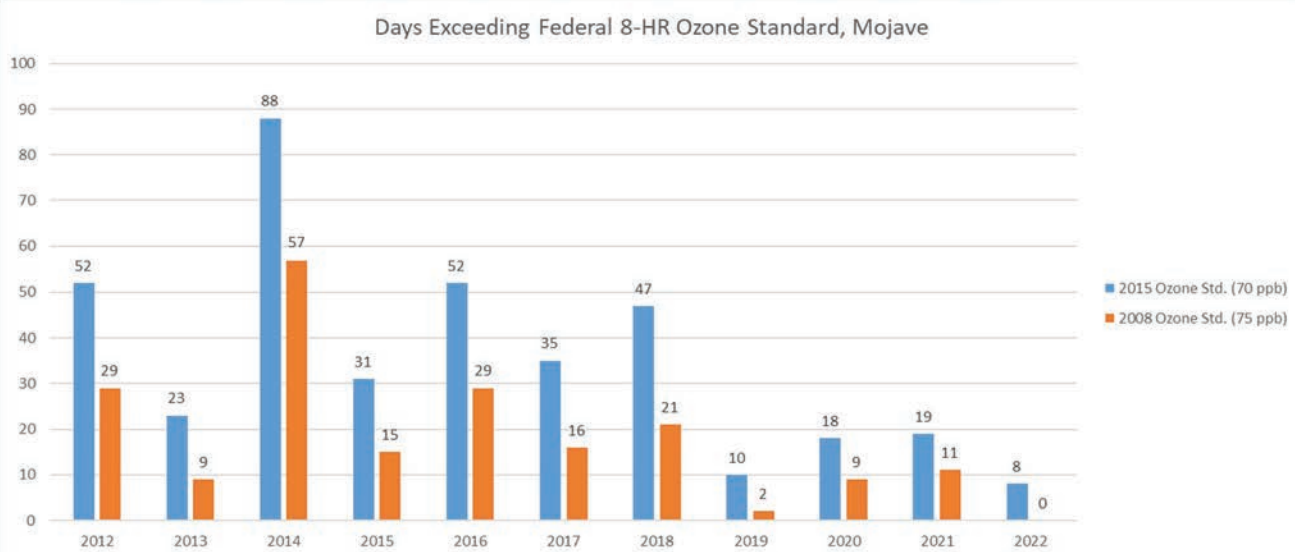
The District installed continuous monitors in Ridgecrest in 2018 and in Canebrake in 2019 to replace monitors that ran once every 6 days.

Exceedance during 2020-2022 largely occurred during high wind events or when smoke from wildfires were impacting Kern County.



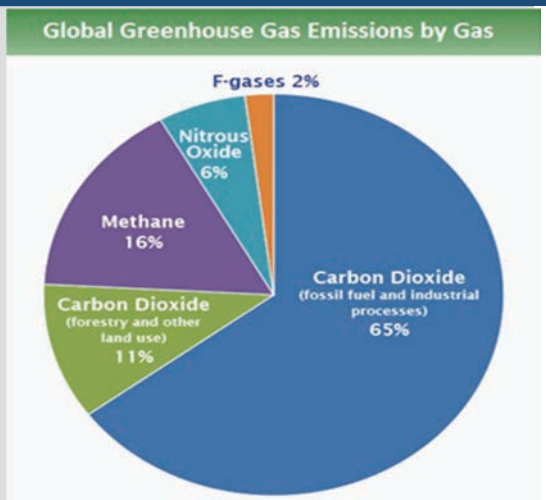
Exceedances during 2020-2022 largely occurred during high wind events or when smoke from wildfires were impacting Kern County; many of these qualified as exceptional events are not counted towards the District's attainment status.

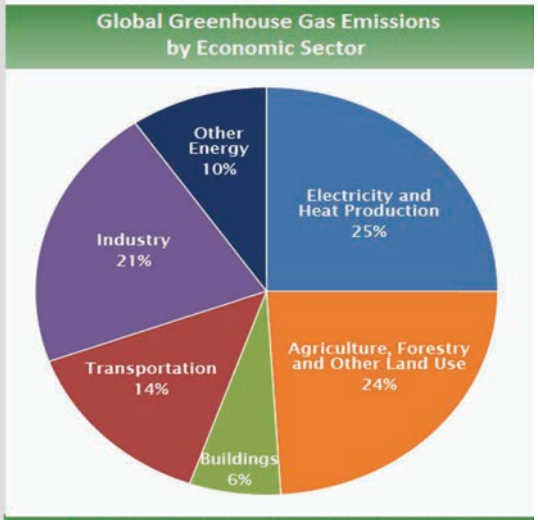


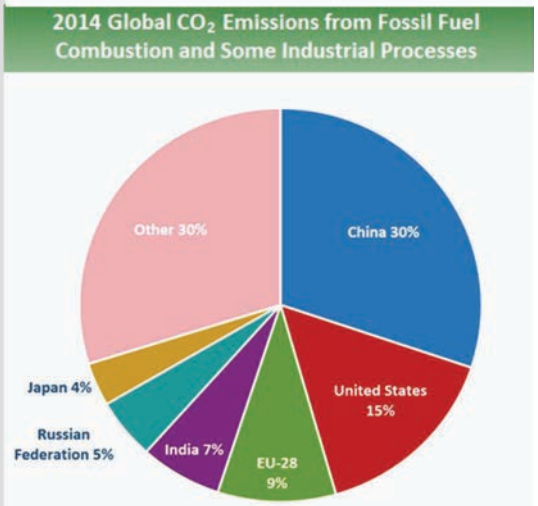


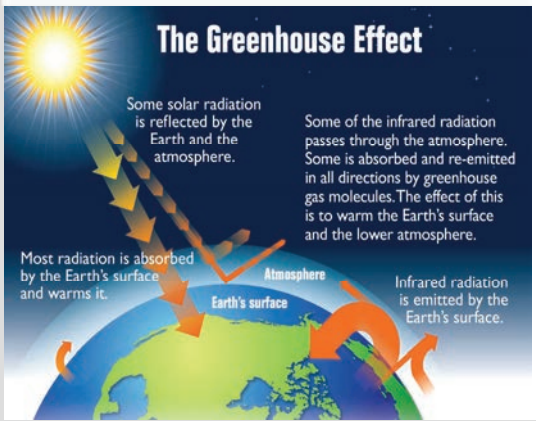
2020 and 2021 exceedances primarily occurred when large wildfires were impacting Kern County.

Carbon Dioxide









Although Carbon Dioxide (CO_2) is beneficial for our planet, too much of it can result in global warming. As we know, there are four categories of greenhouse gases (GHG) which contribute to global warming these are: CO_2, Methane (CH_4), Nitrous Oxides (N_20), and fluorinated greenhouse gases (F-GHGs) with CO_2 being the most prevalent. Even though CO_2 only makes up a small fraction of our atmosphere (0.04%), CO_2 is the most prevalent GHG accounting for 81% all GHG gases. Hence, reducing CO_2 by means of reducing fossil fuel consumption may be the most effective way to mitigate global warming. Fortunately, the California Air Resources Board (CARB), in response to Assembly Bill (AB32) is taking aggressive measures to achieve emissions reductions from all sectors.

The very nature of CO_2 that makes it beneficial to our survival could also make it detrimental to our planet. GHGs specifically CO_2, trap heat close to the earth which helps retain heat. Without GHGs heat would escape the earth's atmosphere and go back into space resulting in potential frigid or inhabitable conditions for humans. However, there is an optimal range of CO_2 in the atmosphere, too much will cause the Earth's temperature to warm too much. Over the last 30 years CO_2 emissions generated by humans have increased dramatically.

According to the U.S. EPA, anthropogenic carbon dioxide emissions in the United States increased by about 43% since 1990, particularly in East Asia, Europe, and the U.S. Since the combustion of fossil fuels is the largest source of greenhouse gas emissions in the United States, changes in emissions from fossil fuel combustion have historically been the dominant factor affecting total U.S. emission trends. California has developed many strategies for reducing CO_2 emissions from fossil fuels which apply to homes, businesses, industry, and transportation sectors.

In 2006, AB 32 also known as the California Global Warming Solutions Act was passed. AB 32 was the first program in the country to take a comprehensive, long-term approach for addressing climate change and reducing GHG emissions to 1990 levels by 2020. California achieved this goal four years early in 2016. The State's new goal is to reduce emissions an additional 40% below 1990 levels by 2030. According to CARB, in 2020 alone, GHG's emissions in California fell by 35.3 metric tons alone. An inventory of emissions including GHG's is submitted to the District by large sources each year to properly track progress. Much progress has been made to reduce CO_2 over recent years with California leading the way.

Fortunately, we can all contribute in many ways to reduce CO_2 emissions. Improving the insulation of buildings, switching to renewable energy, traveling in more fuel-efficient vehicles, and using more energy efficient or electrical appliances are all ways to reduce energy use, and thus cut CO_2 emissions. The District encourages the use of low emission and electric vehicles through the use of grant programs including the DMV and FARMER grants. You can also contribute by reducing personal energy use by turning off lights and electronics when not in use. This reduces electricity demand. Reducing distance traveled in vehicles reduces consumption of fossil fuels. In the future, carbon dioxide capture and sequestration is a set of technologies with potential to greatly reduce CO_2 emissions from stationary sources. Carbon dioxide is also entrained in many substances including cement. The main component of cement, limestone (calcium carbonate – $CaCO_3$) releases CO_2 when heated to over 1652°F (900°C). Hence, cement plants are exploring new raw materials to reduce CO_2 emission while maintaining desired properties. As with all things in life, we must achieve a balance to survive in our modern society and CO_2 is not the exemption.

Wildfires

Everyone in California is enjoying fewer extreme wildfires in recent years. This can be accredited to a combination of generous rain events, cool weather, and great work done by forest management teams. Less than 400,000 acres burned in California in 2022 compared to 4 million acres in 2020. However, imminent danger of a potential catastrophic wildfire is always there. According to the forest service, an estimated 36 million trees died across California due to recent drought conditions and bark beetle infestation. Those dead and dying trees make forests more vulnerable to wildfires. Fortunately, a lot of work is done each year to prevent large wildfires.

The State and Federal Forest Services work continuously to reduce severity of future wildfires by utilizing prescribed burning and other practices within their lands. The District works with the Forest Service to reduce smoke production during these prescribed burning events by monitoring smoke and evaluating smoke management plans. The Fire Department maintains the fire hazard reduction programs for local residents. The goal of the fire hazard reduction program is to protect life and property by providing local residents in wildfire prone areas with proper education and tools for adequate defensible spacing. Adequate defensible space acts as a first line of defense barrier to slow or halt the progress of a fire that would otherwise engulf a property. It also helps ensure the safety of firefighters defending the property. The District in a joint effort with the Kern County Fire Department, issues hazard reduction burn permits to ensure burning of material is cleared and done safely with minimum amounts of smoke generated. Burn data is then sent to the California Air Resources Board for use in forecasting and attainment determination.

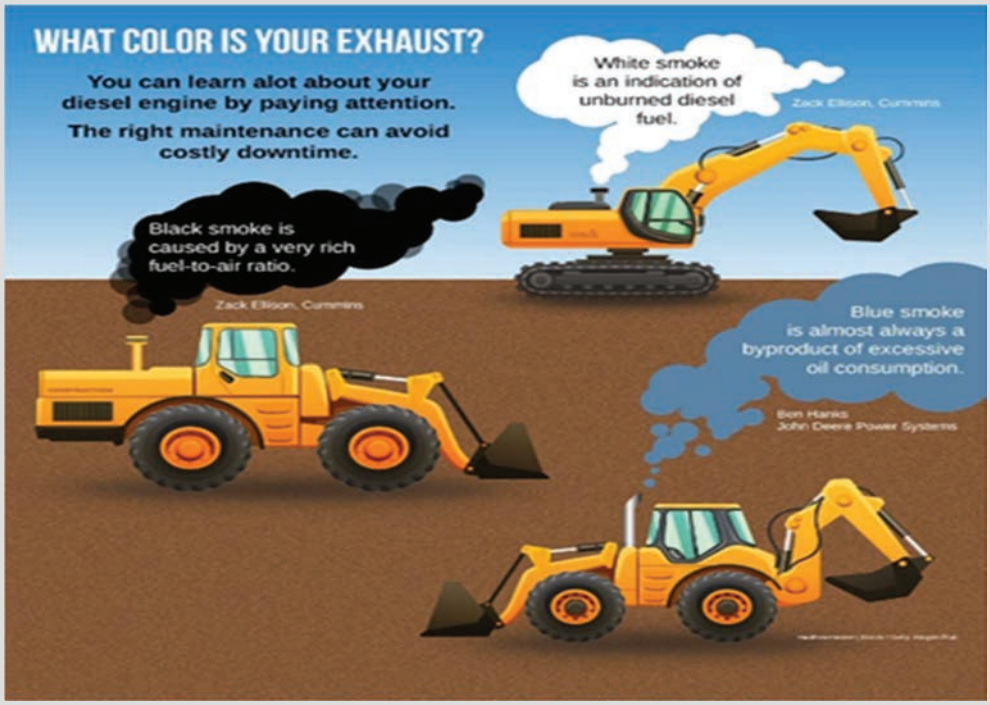
During an active wildfire, the District is continually informed by land managers on the latest situation so timely information may be provided to residents to minimize exposure to wildfire smoke. District Health Advisories provide important “Do’s and Don’ts” for residents when smoke is impacting surrounding communities. Air monitors are also deployed to properly track fire impact on local air quality. Smoke is made up of a complex mixture of gases and fine particles produced when wood and other organic materials burn. Fine particulates can penetrate deep into your lungs, and they can cause a range of health problems, from burning eyes and a runny nose to aggravated chronic heart and lung diseases. With proper preparation, we can all prevent wildfires and enjoy breathing clean air.

Toxic Emissions

The state and District have worked together to increase awareness of Toxic Air Contaminants (TAC). TAC also known as hazardous air pollutants (HAP) may contribute to increase mortality or an increase in serious illness. The California Air Resources Board (CARB) has formally identified over 200 substances that may have an adverse health effect including substances like benzene, toluene, and asbestos.

In 1987 California Assembly Bill 2588 (AB2588) was signed into law. AB2588 mandated stationary sources to inventory and report the types and quantities of certain toxic substances routinely released into the air. This toxic inventory report is analyzed to ensure toxic emissions are not causing localized impacts to nearby population. Every year, as mandated by AB2588, the District conducts the following: quantify and assess health risks from subject facilities to nearby residents, notify affected residents if significant risks are present, and if required, work with facilities to reduce significant health risks to acceptable levels.

In 2022, CARB passed amendment to the Emission Inventory Criteria Guidelines Regulation. This regulation is meant to enhance the public access to information on toxic pollutant emissions and require the reduction of localized health risks at facilities that may present significant impacts. The proposed amendments are also designed to support community-focused efforts at CARB to reduce criteria pollutants and air toxic emissions from California's most disadvantaged communities. Inventory data helps identify what is being emitted into the air, by who, and where. Inventory data helps to guide and provide the scientific basis for CARB's regulatory development process, to identify and address areas of concern, and to track progress in emission reduction efforts from stationary sources.



Plans and Regulations

Background

The Federal Clean Air Act (CAA) of 1970 required the United States Environmental Protection Agency (U.S. EPA) to develop health-based National Ambient Air Quality Standards (NAAQS) for several categories of air pollutants, which include the following six criteria pollutants: particulate matter (PM), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NOx), carbon monoxide (CO), and lead (Pb). U.S. EPA periodically reviews the NAAQS and associated scientific basis in determining appropriate revisions. Accordingly, U.S. EPA establishes new standards following advances in scientific understanding of the pollutant and its potential health effects.

The Federal Clean Air Act Amendments (FCAAA) of 1977 required U.S. EPA to divide the United States into "Planning Areas" and designate these areas "attainment", "non-attainment", or "unclassified" within 3 years of adopting the NAAQS. The FCAAA of 1990 gave states the primary responsibility for achieving the NAAQS. The principal mechanism for complying with the FCAAA is developing and adopting a State Implementation Plan (SIP). A SIP outlines programs, actions, and commitments a state will carry out to implement its responsibilities under the FCAAA. Once the U.S. EPA approves the SIP it becomes a legally binding document under both state and federal law and may be enforced by either government.

In 1992, Kern County was divided between two air districts based on geography that creates two air basins. The valley portion of Kern County became part of the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the high-desert portion of Kern County remained the Kern County Air Pollution Control District (KCAPCD). In 2010, KCAPCD was appropriately renamed Eastern Kern Air Pollution Control District.

Although the District's jurisdiction is primarily located in the Mojave Desert air basin, U.S. EPA initially considered it part of the San Joaquin Valley Federal Ozone Planning Area. This was until 2001, when U.S. EPA formally agreed to the District's request to designate Eastern Kern a separate ozone planning area from SJVUAPCD. Later in 2004, the District was divided into two planning areas, the Indian Wells Valley (IWV) attainment area, and the remainder of the District, nonattainment area.

Ozone

Stratospheric ozone occurs naturally and is beneficial in the upper atmosphere, shielding the earth from harmful ultraviolet radiation from the sun. However, ground-level (tropospheric) ozone (O_3) is a colorless gas with a pungent, irritating odor and is a highly reactive harmful air pollutant that can damage living tissues and man-made materials upon contact.

O_3 is not directly emitted from sources but formed in the air by reactions of the O_3 precursor emissions NOx and VOC in the presence of sunlight and heat. Accordingly, peak O_3 levels occur during the sunnier, warmer times of the year, typically April through October and hit the highest levels during the hottest part of the day.

Health effects of O_3 are focused on the respiratory tract. When inhaled, O_3 can irritate and inflame the lining of the lungs, much like sunburn damage on skin. Potential health impacts include aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis. Individuals with respiratory problems are most vulnerable to O_3, but outdoor activities on "high" O_3 days can even affect normally healthy people.

2008, Ozone NAAQS

In 2008, U.S. EPA adopted a more stringent 8-hour O_3 NAAQS of 75 parts per billion (ppb). Although the District's nonattainment area showed significant O_3 reductions by attaining the 1997 O_3 NAAQS of 80 ppb, air-monitoring data showed O_3 levels higher than 75 ppb. U.S. EPA initially classified the District's nonattainment area as "Marginal" nonattainment pursuant to the 2008 O_3 NAAQS, however photochemical modeling along with supplemental analyses determined the District would not attain the 2008 NAAQS until the "Serious" nonattainment deadline of 2021. Therefore, the District adopted an attainment plan in 2017 that identified emission control measures and associated emission reductions necessary to demonstrate attainment by 2021. Unfortunately, the District did not achieve attainment of the 75 ppb standard by 2021, and was reclassified to "Severe" nonattainment, now required to attain by 2027. The IWV attainment area currently meets all requirements of the 75 ppb NAAQS.

2015, Ozone NAAQS

In 2015, U.S. EPA revised the 8-hour O_3 NAAQS again by lowering it from 75 ppb to 70 ppb. The District was classified as "Serious" nonattainment with an attainment date of 2027. However, photochemical modeling showed the District would need more time to achieve the necessary emissions reductions required to meet attainment. The modeling demonstrated that attainment could be achieved by 2033, which is the deadline for the "Severe" nonattainment classification. In 2023, the District formally requested U.S. EPA to reclassify the nonattainment area to Severe pursuant to the 2015 NAAQS in order to allow the additional time needed to attain.

Ozone Attainment Plan

On May 4, 2023, the District adopted an ozone attainment plan for the 2008 and 2015 8-hour O_3 NAAQS. The plan was designed to include all provisions to satisfy the requirements for "Severe" nonattainment. The plan demonstrates that the District will attain the 2008 standard by 2027 and the 2015 standard by 2033. Both milestone years are the applicable attainment dates for the "Severe" classification.

RACT

In order to meet the NAAQS, the FCAA requires certain emission sources in O_3 nonattainment areas to implement control methods called Reasonably Available Control Technology (RACT). RACT can be described as the lowest emission limitation a particular source is capable of achieving by the application of an air pollution control device, system, or technique that is reasonably available, considering economic and technological feasibility. RACT requirements are included in the FCAA to assure that significant emission sources of the O_3 precursors NOx and VOC are controlled to a reasonable extent.

California nonattainment areas must submit a SIP to the California Air Resources Board (CARB) that details the methods used to achieve attainment. Adoption and implementation of RACT rules is a crucial component of an approvable SIP and is key to the District successfully attaining the NAAQS.

PM_{10}

Particulate matter is the term given to tiny particles of solid or semi-solid material suspended in the atmosphere. PM_{10} refers to a subset of particulate matter 10 micrometers in diameter and smaller. Epidemiological and laboratory studies of humans and animals indicate that PM_{10} can be inhaled deeply into the respiratory system, resulting in aggravation of existing respiratory and heart diseases, damage to lung tissue, impairment of breathing and respiratory functions, alterations to the body's physical and immune system defenses, and even premature death. Many particles are also composed of compounds that are known or suspected human carcinogens. People most sensitive to particulate matter are the elderly, children, and those with chronic lung disease, cardiovascular disease, influenza, and asthma.

PM_{10} NAAQS

The 1970 FCAA also required U.S. EPA to adopt a standard for total suspended particulates (TSP) of less than 40 microns was adopted. In 1985, the U.S. EPA revised the NAAQS to replace the TSP standard with a PM_{10} limit of 150 micrograms per cubic meter (ug/m^3) averaged over a 24-hour period. PM_{10} is a regulated air pollutant because it can be inhaled deep into the respiratory system and lead to a variety of health effects.

IWV PM_{10} Maintenance Plan

In 2003, the U.S. EPA approved the District's IWV PM_{10} attainment demonstration, maintenance plan, and re-designation request and the IWV was reclassified to attainment. The plan projected that PM_{10} emissions would decline and then remain constant through 2013. This proved to be true, there were no exceedances and PM_{10} levels remained relatively flat. The FCAA also required the District to submit a second PM_{10} maintenance plan that demonstrated continued attainment for at least ten additional years. Forecast air modeling showed continued attainment well beyond the end of the second 10-year maintenance period. The District's Board adopted the second IWV PM_{10} maintenance plan in 2020.

PM_{10} Nonattainment Area

The remainder of the District, outside of the IWV, is designated Unclassifiable/Attainment pursuant to the PM_{10} NAAQS. However, the Kern River Valley, Bear Valley, and Cummings Valley were included in SJVUAPCD's PM_{10} "Serious" nonattainment area prior to becoming part of the District's jurisdiction. In 2008, this region was designated as a nonattainment planning area. Although air monitoring has shown it to be in attainment, it has not been officially reclassified as attainment. The District is continuing to work with CARB and U.S. EPA to get the area reclassified.

District Rules

The District has developed and implemented approximately 136 rules designed to reduce air pollutants being emitted from local source activities. Such activities include open burning, fuel burning, gasoline storage, solvent use, dry cleaning, various coating operations, cement production, mining, construction, agricultural sources, landfills, and more.

As technology and air quality standards change and progress, existing rules may need to be revised or new source category rules drafted and adopted. Rule development is generally a very lengthy process that involves many guiding principles and procedural steps. Years can pass where no rule amendments are necessary. However, in 2022, the District was required to amend fourteen existing rules and adopted one new rule. Looking into future rule development 2023-2024, the District plans to draft a new asbestos rule, in addition to amending the Stationary Gas Turbines, Fugitive Dust, Cement Kilns, Wood Products Coatings, and Graphic Arts rules.

Permitting

The District's mission is to protect people of Eastern Kern County from the effects of air pollution from stationary sources. This is done, in part, through the District's permitting program. The District's permitting program has been established to minimize air pollution, implement requirements of the federal and state Clean Air Act (CAA), by specifying operating and compliance requirements for stationary sources of air pollution. The permitting program implements federal, state, and local air quality rules and regulations by specifying operational and compliance requirements for these stationary sources. Permits issued by the District protect public health and help the District achieve and maintain federal and state ambient air quality standards. The District issues two types of permits: Authorities to Construct (ATC) and Permits to Operate (PTO), to aid businesses in complying with the District's regulations. Once a permit application is received and processed, an ATC is generated. The Permitting process is summarized below:

1. Authority to Construct (ATC) Permit.
The ATC permit allows for the construction of a new facility or installation as well as modification of equipment at an existing facility. The ATC ensures the equipment is designed, constructed, and operated to meet local, state, and federal air quality requirements. New sources of air pollution and modifications to existing sources that result in an increase in emissions are required to implement best available air pollution control devices or best management practices.

2. Startup Inspection:
After construction, installation, or modification done under an ATC, a compliance demonstration period allows for temporary operation for testing, calibration, and demonstration of compliance with the ATC's requirements. Inspection also includes verifying installation of emission controls required by the ATC permit as well as any necessary emissions testing. Once the equipment is ready for operation, an initial compliance inspection is then performed. Upon passing this inspection, the ATC transitions into a Permit to Operate (PTO).

3. Permit to Operate (PTO).
The PTO allows for ongoing operation of the facility in accordance with all permit conditions and local, state, and federal air quality requirements. Operating permits are renewed annually upon payment of annual fees.

Federally Mandated Operating Permits or Title V permits, are required by federal law for facilities that are considered to be "Major Sources" of air pollution or fall under federally regulated source categories. Title V permits enable both the EPA and the public to take a more active role in the permitting process of the largest air pollutant emitters. Additionally, Title V permits are also designed to standardize all monitoring and reporting requirements for major sources of air pollution. The District currently manages Title V permits for 10 facilities.

Enforcement

Every source or business with permitted equipment must undergo an annual inspection to ensure compliance with all operational conditions stated in its assigned permit. During an inspection, if any violation of operational conditions is found, there are two enforcement actions that can be taken:

1. **Notice to Comply (NTC):** This is primarily the first step in all enforcement action. It serves to set a deadline for corrective action to be completed and return to compliance. The date range assigned is determined by enforcement personnel but must be no less than 5 days and no greater than 30 days. If the corrective action has not been taken and the violation is still on-going on or passed the deadline date, enforcement action will escalate to a Notice of Violation.

2. **Notice of Violation (NOV):** The issuance of a NOV is formal recognition that District rules or regulations have been violated. This could result in financial penalties and a permanent record of non-compliance. A NOV can be issued as a first step enforcement action depending on the type of violation. These violations can arise from annual inspections, complaints, or non-scheduled encounters.

The District offers aid and guidance when assisting sources with compliances issues prior and following enforcement action.

Air Monitoring

The District maintains numerous monitoring sites to analyze the air quality in the District as well as to ensure current air quality goals are being accomplished. There are three regulatory sites in the District, two of which are maintained by District staff and one maintained by the California Air Resources Board (CARB). These sites measure PM_{10} (particulate matter that measures 10 microns and less), $PM_{2.5}$ (particulate matter that measures 2.5 microns and less) and Ozone. They are located in Canebrake (area within the Kern River Valley), Ridgecrest, and Mojave (CARB maintained). Regulatory monitors must be quality checked at least once a month and are audited by the State every six months. The data goes through three levels of validation and is eventually uploaded to the Environmental Protection Agency's Air Quality System (AQS). The District also has monitors and sensors in Tehachapi, Kernville, Boron, Rosamond and Cantil with plans to expand. Our website shows up to date air quality data to inform the public on current air quality status.

Carl Moyer Memorial Diesel Emission Reduction Program

The Carl Moyer Memorial Diesel Emission Reduction Program (CMP) is a voluntary grant program that reduces air pollution from old high-emitting diesel-fueled vehicles and equipment by providing incentive funds for their replacement with cleaner-than-required engines, equipment, and emission reduction technologies. The CMP begin in 1998 through a partnership between the California Air Resources Board (CARB) and the District. The CMP is one of CARB's first voluntary emission reduction programs named after the late Dr. Carl Moyer, who was a key figure in developing creative solutions to California's air quality challenges.

Emissions from heavy-duty diesel engines have been identified as a major source of air pollution, including smog-forming nitrogen oxides (NOx), and cancer-causing air toxics including particulate matter (PM) from diesel combustion. Seventy percent of the airborne carcinogens in California come from diesel exhaust. The CMP accelerates the replacement of older, dirtier diesel engines with newer, cleaner technologies. Emission reductions achieved by the CMP play a critical role in helping California meet federal air quality standards and reducing toxic emissions and associated health risk in communities throughout the state.

The District has awarded millions of dollars in CMP funds over the years on numerous eligible retrofit, repower, and replacement projects. However, many milestone compliance dates of CARB's on and off road heavy-duty diesel regulations have passed. This is making it increasingly difficult to find eligible projects that are considered "voluntary". Projects that remain voluntary and eligible for funds are from equipment categories not currently subject to regulatory requirements. These categories include emergency equipment, school buses, and agricultural tractors. More information regarding the CMP, including Guidelines & Applications, can be downloaded from the District's website: www.kernair.org or by contacting the District at: (661) 862-5250 or ekapcd@kerncounty.com.



DMV Grant Program

Assembly Bill 2766 (AB 2766) authorized the Department of Motor Vehicles (DMV) to collect a clean air fee as part of the annual motor vehicle registration process. Revenue generated from AB 2766 are passed to local air Districts to assist with implementing the California Clean Air Act (CCAA). AB 2766 funds are designated for the use of reducing air pollution generated from motor vehicles and motor vehicle-related activities. The District allocates a substantial portion of AB 2766 funds to support its DMV Grant Program.

The DMV Grant Program is designed to provide a mechanism for the fair, unbiased distribution of AB 2766 funds to eligible emission reduction projects located within the District's jurisdiction. Grantees can receive up to $50,000 for an eligible project that reduces oxides of nitrogen (NOx), reactive organic gas (ROG), or particulate matter (PM_{10}) emissions from on-road motor vehicle related activities. Eligible project categories vary from year to year, but usually included funding for: road paving, installation of Level II or Level III public accessible EV charge stations, installation of a public accessible CNG refilling stations, public education courses geared toward reducing emissions, vanpool implementation, construction of a park & ride facilities, and construction of a bike paths.

The District has awarded millions of dollars toward the completion of DMV Grant Program projects since its inception in 1992. The DMV Grant Program occurs annually with the application period beginning October 1 of each year and closing at 5:00 P.M. on the last Friday of the following February. All eligible projects are awarded DMV funds unless the Program is oversubscribed. If the program is oversubscribed, the District uses a random selection lottery to select projects. More information regarding the DMV Grant Program, including Guidelines & Applications, can be downloaded from the District's website: www.kernair.org or by contacting the District at: (661) 862-5250 or ekapcd@kerncounty.com.



Lower Emission School Bus Program

Diesel exhaust emissions contain small toxic particulate matter with an aerodynamic diameter of less than 10 microns (PM_{10}), about 1/7th the thickness of a human hair. This includes the finer subgroup of particles with an aerodynamic diameter of 2.5 microns ($PM_{2.5}$) and smaller. Diesel exhaust is a serious public health risk and considered the number one airborne carcinogen in California. School-aged children are considered sensitive receptors and are more at risk of developing health-related illness due to diesel emissions exposure.

In an effort to reduce children's direct exposure to toxic diesel exhaust emissions, the District offers incentive funding through the Lower-Emission School Bus Program (LESBP) to accelerate the replacement of older high-emitting school buses. School districts are awarded grant funds to replace eligible diesel-fueled school buses that are at least 20 years old with new low emitting diesel-fueled and zero emission electric school buses. Thus, reducing children's exposure to toxic PM emissions. The LESBP does not impose any regulatory requirements on school districts and participation in the program is voluntary. However, old buses that are replaced must be permanently taken out of service and recycled.

DMV Vehicle Voucher Program

This program offers financial incentives for the purchase of a zero-emission electric vehicle. Applications are processed continually throughout the year until the allocated budget is depleted. The DMV Voucher Program has helped to purchase over 140 vehicles and awarded over $480,000.

Woodstove Replacement Program

In 2019 as part of the California Climate Investments, the Wood Smoke Reduction Program was initiated. This statewide program used cap-and-trade funds to reduce greenhouse gas emissions and improve public health and the environment. Funds were committed for the replacement of uncertified, inefficient wood burning devices in residential homes with cleaner burning, efficient devices.

The State ceased funding after two years of operation, however, due to the success of the program the District has allocated Community Air Protection Program funds to continue the program. The program opens in October of each year, and applications are processed as they are received. This program is extremely popular as funds are typically exhausted within a matter of weeks. The Wood Smoke Reduction Program has assisted with the replacement of over 150 inefficient wood burning devices and has contributed more than $460,000 to the citizens of the District.

FARMER (Tractor Replacement Program)

The California Air Resources Board developed the *Funding Agricultural Reduction Measures for Emission Reduction* (FARMER) Program, with the goal to reduce emissions from the agricultural sector. The FARMER program provides grants, rebates, and other financial incentives to decommission inefficient equipment and replace with cleaner operating technology. This includes but is not limited to engines, harvesting equipment, heavy-duty trucks, tractors, and other equipment used in agriculture operations.

The District administers these funds on behalf of the State and distributes the funds to eligible grantees, through an application process. The District has awarded over $1,000,000 through the FARMER Program for the replacement of high polluting agriculture equipment in Eastern Kern County.

Community Air Protection Programs (AB617)

These programs provide funding to achieve the goals of Assembly Bill 617 (Statutes of 2017). Funds support selecting locations and deploying community air monitoring systems, deploying fence-line monitoring, developing an expedited schedule for requiring best available retrofit control technology, and developing Community Emissions Reduction Programs.

The District administers these funds for a variety of projects, including the following: purchasing HEPA air purifiers for residents, school bus replacement, upgrading ozone analyzers at regional air monitor, and continuing the Wood Smoke Reduction Program. The District has dispersed over $1,220,000 for Community Air Protection Programs.

Public Outreach

The District strives to work with Eastern Kern residents, schools, non-profit organizations, businesses, and industry to reduce air pollution. This is done through various outreach efforts including public meetings, workshops, and advertised public notices. Outreach is conducted to inform stakeholders of proposed rules, regulations, attainment plans, and upcoming incentive programs. The public and industry representatives are invited to participate in open discussion town hall style workshops for proposed rules, regulations, and attainment plans. All comments and questions are welcome for open discussion at the workshops. An additional 30-day public review period will follow all workshops to allow stakeholders ample time to comment. Additionally, public hearings are announced 30-days prior to all Board meetings when considering adoption of rules, regulations, and attainment plans. Anyone interested in the process is welcome to attend the Board meetings and have any final questions or concerns addressed.

Current and upcoming incentive programs, which include awarding grant funds for electric vehicle (EV) rebates, installing EV charge stations, replacing old wood stoves and fireplaces, paving publicly accessible dirt roads, and replacing heavy-duty diesel-fueled equipment through the LESBP and CMP will be announced on the District's website and in the Desert Breeze. The Desert Breeze is a quarterly newsletter published by the District that can be download from the District's website: www.kernair.org or mailed to recipients whom have signed up on the mailing list.

Over the years, the District has funded many science-based air-quality curricula for schools that range from educating elementary students on the causes and effects of air pollution and what can be done to achieve emissions reductions, to educating high school students on photovoltaic solar power generation and zero-emissions EV technology. The District has also awarded grant funds for a first responder-training course to instruct on proper methods for handling motor vehicle accidents involving EVs.

Other District outreach includes sponsoring various Park and Drive events, which display passenger EVs, zero emissions transit buses and school buses, along with highlighting other new zero emission technology. Past events have allowed participants the opportunity to test-drive various EVs. Additionally, the District has staffed booths at lawn and garden expos and Earth Day events to discuss grant programs and make themselves available to the public for questions, comments, and concerns. Lastly, this Information Report is an outreach tool designed to keep the public informed of District activities.

For more information on the District's programs and outreach, including applications and guidelines, please visit the District's website: www.kernair.org or contact the District at: (661) 862-5250.

On the Horizon

The change we have experienced during the past couple of years has been dramatic. We have passed through the COVID-19 pandemic, most people are going about their day without masks. Industry production (including new industry) is beginning to ramp up and we are having meetings of all types, again. We had a record rain and snow fall in 2023 and the State is exiting the drought in most areas. Our air quality is improving, but we still have challenges on the horizon.

Something that is always on the horizon is new technology. We are seeing the emergence of automatous driving vehicles, but more importantly, how are these vehicles being powered. There has been a concerted effort to reduce greenhouse gases emitted into the atmosphere. Mostly, by reducing carbon dioxide emissions. Burning of fossil fuels (including natural gas) emit two main components, carbon dioxide (CO_2) and water (H_2O). In vehicles and other areas, a couple of technologies have emerged electricity from solar power and hydrogen combustion. I am going to ignore hydrogen combustion because I am not aware of hydrogen reserves. Therefore, hydrogen has to be made by electrolysis (using electricity to break H_2O into H_2 and O_2) or methane reforming (using high pressure/high temperature steam to convert the methane {CH_4} in natural gas inside a catalyst into CO_2 and H_2). Methane reforming accounts for 95% of the hydrogen produced today. As the description suggests, we are using fossil fuels to manufacture a non-fossil fuel. The process seems counterproductive.

However, some exciting technology is emerging from solar power generation. Companies and universities all around the world are researching methods of manufacturing higher efficiency solar photovoltaic power generating cells. In 1960 solar photovoltaic efficiency was approximately 14%; however, with new technology, that efficiency can be up to 48% (using silicon cell technology). Additionally, new battery technology are being developed. Currently lithium –ion batteries are the standard; however, solid-state, lithium-sulfur, cobalt-free lithium-ion batteries and others are being developed. These developments are leading to batteries that are safer, longer storage life, higher storage capacity, and are less expensive to manufacture.

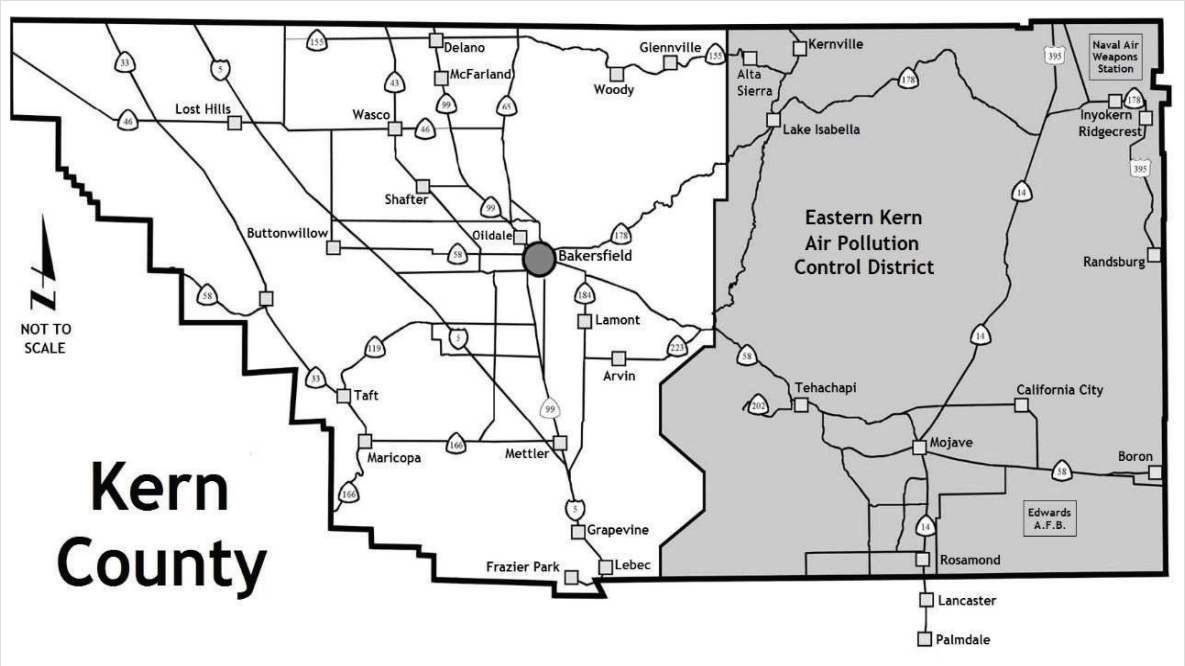
New rules and regulations are being implemented to reduce emissions. As a local air district, we are responsible for reducing emissions from stationary sources. Unfortunately, stationary source emission accounts for approximately 15% of California's air emissions. Based on a report from the California Air Resources Board (CARB) approving Advanced Clean Cars II (ACCII) rule, transportation is responsible for approximately 80% of air pollutants in California. ACCII rule sets California on a path to rapidly growing the zero-emission car, pickup truck, and SUV market and deliver cleaner air and massive reductions in climate-warming pollution. Ultimately, by 2037, the regulation delivers a 25% reduction in smog-causing pollution from light-duty vehicles to meet federal air quality standards. Also, in 2023 the CARB passed the Advanced Clean Truck rule that requires a phased-in transition toward zero-emission medium-and-heavy duty vehicles. Known as Advanced Clean Fleets, the rule helps put California on a path toward accomplishing Governor Gavin Newsom's goal of fully transitioning the trucks that travel across the state to zero-emissions technology by 2045.

If all goes well, this will be my final District Report. I am planning to retire in 2024. At this juncture in my life, I have one overwhelming emotion, Joy. Not because I am leaving, but because of all the people who helped me throughout my career. I first want to give thanks to my Mother and Father for life and wisdom they give me, and without them I would not exist. Thanks to my Lord and Savior Jesus Christ. I am a two-time cancer survivor (amongst other things), and without his grace and mercy I would have perished years ago. Thanks to to my predecessors, Bill Roddy, Tom Paxson, and Dave Jones. Thanks to my prior supervisor Tom Goff. Thanks to my coworkers and friends: Leonard Scandura, Harvey Lopez, Cliff Calderwood, and Creighton Smith. Thanks to my Staff for the past eleven years including: Louise Roman, Trish Ferdon, Gerald Barrett, Jeremiah Cravens, John Hayes (posthumously), Cherita Young, Wunna Aung, Daisy Vallarta, Brenton Smith, Nicole Dickerson, Sam Johnson, Katie Lantz, Miguel Sandoval Ortega, Gary Ray, David Arokiasamy, Melissa Atkerson, Heather Handy, and Doreatha Foots. A hearty thanks to the District's Board of Directors over the past eleven years: Michael Davies, Zach Scrivner, Jim Creighton, Kyle Blades, Phillip Peters, Mick Gleason, Ed Grimes (posthumously), Peggy Breeden, Don Parris, Rick Warren, Chip Holloway, Patrick Bohannon, and Jon McQuiston for hiring me and their support throughout the years. A special thank you to my children: Yasser, Crystal, Kevin, and Jason for their support. Finally, last but not least, I would like to thank my love, and my wife, Shelia for all her support.

Throughout my career I have always wanted to make "common-sense" solutions for complicated problems. The bottom line is, as a public agency, we are here for the people, making their lives a little better and their air a little cleaner. Let's do that.

Glen E. Stephens
Air Pollution Control Officer

District **Staff**



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