DESERT BREEZE

VOLUME VII ISSUE III SEPTEMBER 2019

Pollution of the Quarter: Asphalt

From the roads we drive on, to the roofs over our heads, asphalt has enabled significant benefits and conveniences to our communities. Asphalt, a sticky, black, and highly viscous liquid or semi-solid form of petroleum, can often be seen from our front doors. While natural asphalt deposits do exist (such as the La Brea Tar Pits), the majority of asphalt used today is created during the petroleum refining process. During distillation (a process to purify liquids by vaporizing, then subsequently condensing them), lighter hydrocarbons (like gasoline and diesel fuel) will evaporate at temperatures below the boiling point of asphalt, leaving the sticky asphalt residue behind. This "refined" asphalt can then be sold for use in a variety of industries; but is most frequently used in construction.

In 2008, it was estimated that paving operations use approximately 85% of the asphalt produced, and roofing accounted for an additional 10% of use. The material used for paving is often called "asphalt concrete", which is a mixture of size-graded aggregate (a collection of various sized rock), sand, and asphalt cement. These materials are loaded, either continuously or in batches, into a heated, rotating drum mixer to create the pavement mixture. The finished asphalt concrete is then either loaded into storage silos to await transport, or directly loaded into vehicles for transport to paving sites. Asphalt is also used in roofing shingles for its waterproofing and adhesive properties. Heated asphalt is blown with air to soften it for easier flow, and is spray or dip applied to sheets of saturated felt or fiberglass being fed through rollers. The coated felt or fiberglass then has a mineral surfacing (commonly sand, talc, or mica) applied. The coated sheets are cooled and dried, then have a strip of adhesive (typically asphalt) to ensure the mineral coating stays in place. The completed asphalt shingle sheet is then cut to size.

During the process of making asphalt paving and roofing, quite a few air pollutants are released into the atmosphere, such as particulate matter smaller than 10 micrometers in diameter (PM_{10}), oxides of nitrogen (NO_x), volatile organic compounds (VOC), and carbon monoxide (CO). Emissions from the asphalt consist of VOC (from evaporating asphalt) and PM_{10} (from the condensation of asphalt vapors at ambient temperatures). NO_x, VOC, and CO are emitted as a result of fuel combustion to heat the asphalt. Dust created from the handling of mineral products can also create PM_{10} emissions. Additionally, portions of the PM_{10} and VOC released are classified as toxic air contaminants (TAC); unlike criteria pollutants, there is no established safe exposure level for these pollutants. Heavy metals such as arsenic, lead, and mercury are naturally present in aggregate, and make up a portion of the dust created during asphalt concrete manufacturing. Harmful gases such as benzene, formaldehyde, and polycyclic aromatic hydrocarbons (PAH) are emitted during the heating process; the amount of these pollutants emitted is tied to the type of fuel used for heating the asphalt (waste oil, natural gas, etc.) and the temperature the asphalt is heated to.

In order to reduce the impact that asphalt production has on ambient air quality and human health, a combination of emission limits, control technologies, and monitoring requirements are imposed on asphalt manufacturing and use. At the local level, District Rule 410.5 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations) prohibits the manufacture and use of certain types of asphalt in eastern Kern County. District Rule 425.1 (Hot Mix asphalt Paving Plants (Oxides of Nitrogen)) sets a limit on the amount of NO_x that can be emitted from hot mix asphalt plants, requires annual compliance testing, and requires a continuous monitoring equipment be installed. District Rule 422 (Standards of Performance for New Stationary Sources (NSPS)) and Rule 423 (National Emission Standards for Hazardous Air Pollutants and Source Categories (NESHAPS)) incorporate by reference federal requirements for specified facilities, which include asphalt processing and asphalt roofing manufacturing facilities.

Currently, eastern Kern County has no asphalt roofing manufacturing facilities, and has one permitted asphalt concrete manufacturing operation. Prior to issuing a Permit to Operate, the Eastern Kern APCD assesses a facility to ensure compliance with District rules, and to ensure the facility will not present a significant health risk to the public. District staff also perform regular inspections of facilities to ensure continuous compliance.

By: Sam Johnson

The Future is Electric part 3 of 4

The cost of electric vehicles, although generally higher for the consumer at the time of purchase, is getting closer to that of gasoline powered vehicles. Improvements in battery technology, and manufacturing processes are bringing down the cost to manufacture electric cars. The cost of gasoline vehicles tends to increase rather than decrease, as consumers generally want more features and model improvements. Electric vehicles typically include, as standard equipment, features that may cost extra for gasoline vehicles. The difference between the two vehicle class price structures is narrowing. If cost of operation is factored in, electric cars have a total cost of ownership less than that of gasoline vehicles. As the up-front cost of purchasing a Battery Electric Vehicle (BEV) equals or falls below the price of a comparable gasoline vehicle, consumers' acceptance of electric vehicles will accelerate. Online publications such as Inside EVs, electrek, Green Car Reports, and Charged are very good sources for learning more about electric vehicles. When it makes more economic sense to purchase an electric vehicle, before and after the sale, sales will accelerate further.

Popular acceptance of electric cars is very near a critical threshold. Each year more electric cars are manufactured and sold. Electric vehicle enthusiasts are perhaps the best advertising for electric vehicles. For some, the conversion is abrupt. Even Jay Leno suggests that the future will be electric. Tesla, with no 'dealerships', and word of mouth advertising, commands a healthy market-share over all prospective competitors. This is a huge development because in a similar fashion, gasoline powered vehicle manufacturers, known to spend generously for advertising and marketing, generally do not aggressively advertise and market electric vehicles. As market sentiment shifts, manufacturers are entering the sector with their own electric vehicles. Lately, even multiple models are sold by some manufacturers. In 2010 there was one electric vehicle model generally and commercially available – and in 2017 (with some very similar duplicates) there were 48 makes and models available. The new generation of battery electric vehicles, with more than 200 miles of range per charge, will also prompt prospective purchasers to take the plunge.

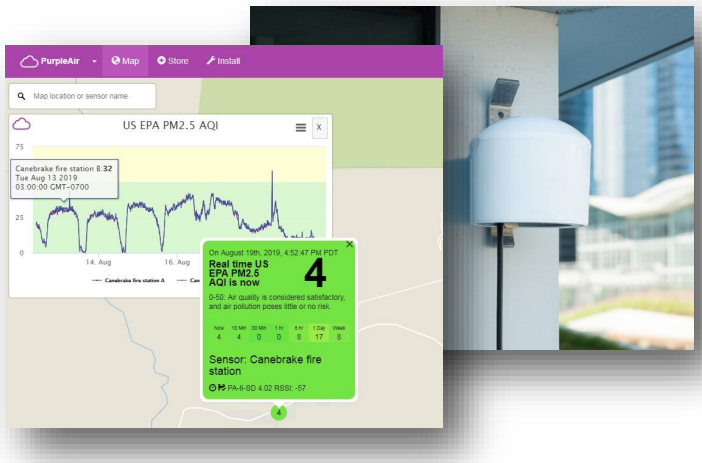
Sales of battery electric vehicles are already accelerating, as shown below. The graph presented below plots the relative value of rebates distributed to consumers per year, with California's Clean Vehicle Rebate Program (CVRP) for battery electric vehicle purchases. For this graph, the actual value of the rebates, and the number of vehicles in the Program are not the message; and, they have not been included. The message of the graph is the dramatic increase, from 2011 to 2018. Applications for *standard* rebates from the CVRP (not low-income rebates) regularly exceed budgeted levels. Applicants are put on a waitlist until additional funding becomes available from the Clean Vehicle Rebate Program. This graph, compiled from statistics available from the Center for Sustainable Energy (193,921 records), is a summary of total Clean Vehicle Rebate Program funds distributed to applicants (for battery electric vehicles only) in the form of post-purchase rebates:

Center for Sustainable Energy (2019). California Air Resources Board Clean Vehicle Rebate Project, Rebate Statistics. Data last updated June 26, 2019. Retrieved August 13, 2019 from https://cleanvehiclerebate.org/rebate-statistic

By: Brenton Smith

COMMUNITY AIR MONITORING

Throughout the state of California, the air quality is being monitored daily with regulatory air monitors. Regulatory air monitors are not only used to assess the air quality in a particular area, but are also used by the Environmental Protection Agency to determine the attainment status of a specific pollutant for that area. While the data that comes from these monitors is available to the public, it may be hard to decipher, and is often not given in "real-time" instantaneous concentrations. A bill was recently passed in California called AB 617, which called for community air monitoring around the State. With this bill, the California Air Resources Board and local Air Districts strive to be transparent in allowing the communities to access this data in an easier more relevant way.



We here at Eastern Kern Air Pollution Control District are currently deploying PurpleAir monitors which measure the concentration of PM_{10}, $PM_{2.5}$ and PM $_{1.0}$. PM_{10} is particulate that is the size of 10 microns or less, $PM_{2.5}$ is particulate that is the size of 2.5 microns or less and $PM_{1.0}$ is the size of 1.0 microns or less. PurpleAir monitors use a laser beam to calculate particle concentration. A fan draws air towards the laser beam and the reflection of particles on the detection plate is measured by pulses. PurpleAir monitors are easy to setup. They fit in the palm of your hand and all they require is access to WiFi and 120-volt power. Instantaneous data shows up on the PurpleAir website which is easily accessible to the public. By associating colors with concentrations, it gives the end viewer an idea of the air quality of that area. This network of monitors accomplishes the goal of transparency to the public, access to clear and relevant data and real-time data availability.

For more information on community air monitoring please visit: https://ww2.arb.ca.gov/capp-resource-center/community-air-monitoring/. To view data from the PurpleAir Monitor Network please visit: http://purpleair.com/map

By: Nicole Dickerson

A LITTLE MOVE—A LITTLE HISTORY

The Eastern Kern Air Pollution Control District (District) Bakersfield Office has moved. We have the same address, 2700 "M" Street, Suite 203, however, a different physical location; adjacent to the Environmental Health Office on the 3rd floor. During the move, I found some old documents that described the history of air pollution. I'll share some highlights:

July 1943	During World War II, Los Angeles residents believe the Japanese are attacking them with chemical warfare. A thick fog that makes people's eyes sting and their noses run has taken hold of the city. Visibility is cut down to three city blocks. It was later determined that the fog was not from an outside attacker, but from their own vehicles and factories.
1947	The Los Angeles County Air Pollution Control District (prelude to the South Coast Air Quality Management District) was established under state legislation which authorized the Board of Supervisors of any county in California to commence operation of a county wide air pollution control district.
December 1952	The Great London Smog of 1952: a thick fog engulfed London and mixed with black smoke emitted from homes and factories; creating a deadly smog. This smog killed about 12,000 people and shocked the world into starting the environmental movement.
November 1955	The Bay Area Air Quality Management District (originally named Bay Area Air Pollution Control District) was formed. Controlling air quality in Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties.
1966	California established the first tailpipe emissions standards in the nation.
March 1967	The California Air Resources Board (CARB or ARB) was established when then-governor Ronald Reagan signed the Mulford-Carrell Act, which combined the Bureau of Air Sanitation and the Motor Vehicle Pollution Control Board. Today, CARB is a department within the cabinet-level California Environmental Protection Agency.
March 1968	The Kern County Air Pollution Control District (KCAPCD) was established by the Kern County Board of Supervisors. The KCAPCD was set up as a department of the County and its jurisdiction encompassed all of Kern County.
October 1969	The Rouge River in Michigan caught fire because of oil dumped into the river. This incident is said to spur the creation of the Environmental Protection Agency. The passage of the Clean Water Act in 1972 made it unlawful to discharge any pollution from a point source into navigable waters, and the EPA's National Pollution Discharge Elimination Program was created to regulate these discharges.
December 1970	The Environmental Protection Agency (EPA) was as independent agency of the United States federal government for environmental protection. President Richard Nixon proposed the establishment of EPA on July 9, 1970 and it began operation on December 2, 1970, after Nixon signed the executive order
1976	The South Coast Air Quality Management District (SCAQMD) was formed by State Legislature known as the "Lewis Presley Air Quality Management Act."
May 1992	The San Joaquin Valley Unified Air Pollution Control District began operations. Later renamed the San Joaquin Valley Air Pollution Control District jurisdiction includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare Counties and the western portion of Kern County.
May 1992	The Kern County Air Pollution Control District size was reduced to exclude the western portion Kern County.
September 2006	Assembly Bill 32, also known as the Global Warming Solutions Act of 2006, was signed by Gov. Arnold Schwarzenegger, giving CARB this new role. AB 32 established a first-in-the-world comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions in greenhouse gases.
May 2010	The Kern County Air Pollution Control District name was changed to Eastern Kern Air Pollution Control District by resolution of the District's Board of Directors.

This is a short, truncated history of air pollution information and agencies that have shaped awareness and improved air quality in California and the world. Independent of the location, the District will strive for improved air quality in Kern County.

By: Glen Stephens

Board of Directors

Don Parris, Chairman (Councilman, California City)
Zack Scrivner , Vice Chair (KC 2nd District Supervisor)
Mick Gleason (KC 1st District Supervisor)
Mike Mower (Councilman, Ridgecrest)
Michael Davies (Councilman, Tehachapi)

Board of Directors usually meet once every two months starting in January at the Tehachapi Police Department Community Room.

Air Pollution Control Officer

Glen E. Stephens, P.E.

Hearing Board Members

William Deaver
Doris Lora
Chris Ellis
Charles Arbaut
John Hayes

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

EASTERN KERN APCD
2700 M STREET, SUITE 302
BAKERSFIELD, CALIFORNIA 93301