



# DESERT BREEZE

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## Pollutant of the Quarter: Agent Orange



**A**gent Orange is an herbicide that was produced in the United States for use on large agricultural operations. It was also used on utility power lines and alongside the railroads to kill the brush that grew adjacent. Its most infamous use was during the Vietnam War. Its effect on the Vietnamese people and US Military personnel who were exposed to the chemical would have a lifelong and deadly result.

Botanist Arthur Galston is credited as the person who discovered the effects of the chemicals that would be later used in Agent Orange. In the early 1940's, he conducted research which showed that spraying 2,3,5-triiodobenzoic acid (TIBA) on soybeans would speed up the flowering of these plants and if an excess amount was sprayed, it would cause the flowers to wilt and fall off. The US Military was aware of this research and reached out to Galston to study the effects on crops such as rice and broadleaf crops. The ultimate result of this research is that these herbicides could be sprayed from aircraft to devastate the food supply of enemy troops as well as



destroy their top cover. The name "Agent Orange" came from the black barrels with an orange stripe that the herbicide was stored in during the Vietnam war.

Two herbicides in a 1:1 ratio make up the composition of Agent Orange: 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) which contains traces of 2,3,7,8-tetrachlorodibenzo-p-dioxin also known as TCDD. The small traces of TCDD are what made this chemical extremely dangerous. TCDD is a dioxin, a group of compounds that are considered Forever Chemicals as they break down extremely slow. Agent Orange could enter a human body usually through physical contact with the skin or ingestion of contaminated food. The chemical can alter the structure of human DNA. TCDD and other dioxins are known to cause cancer, birth defects, skin diseases, type II diabetes mellitus, chloracne and even spina

bifida. What makes chemicals in Agent Orange so devastating in the long run is that the effects of exposure are passed onto the offspring due to the mutation of DNA.

Not only did Agent Orange devastate a human population, but it also influenced the ecology of affected areas in Vietnam. Some areas were never able to be re-seeded, and aggressive plant species made their way into areas that made re-forestation hard. Studies also show a significant decrease in animal species in places that were sprayed compared to adjacent areas not sprayed.

Over 21,000,000 US gallons of Agent Orange were applied in Vietnam from helicopters mostly and by trucks, riverboats, and backpack sprayers. The Vietnamese government states that up to 4 million people in Vietnam were exposed to Agent Orange and at least 3 million people were injured/died due to illnesses related to exposure. US Military Veterans began to believe Agent Orange was the source of their ailments once they returned home. Initially, the US



Government were in denial and even successfully won lawsuits that pertained to the use but over the years, more and more studies have shown correlation to Agent Orange exposure and multiple types of cancers. The use of Agent Orange was completely stopped in 1971. In 1991, the US Congress finally acknowledged that Agent Orange could be presumed to have affected US soldiers in the Vietnam War.

Starting in 2012, the United States and Vietnam are now working together to remediate sites that stored Agent Orange. It was found that the areas with the highest concentration of Agent Orange in the soil were the US Military Bases in Vietnam that stored the chemical.

*By: Nicole Dickerson, Senior Air Quality Specialist*

# In Station Diagnostics

In the last three editions of the Desert Breeze, we have covered various systems helping to reduce emissions from gasoline storage and dispensing operations. As we know, gasoline releases Volatile Organic Compounds (VOCs) which are known to form ozone in the presence of sunlight (see June 2013 article for more information). The first system we covered was the Vapor Recovery Phase I system which controls emissions during filling (fuel delivery) of storage tanks. The Phase II system controls emissions during the transferring of fuel into the vehicle fuel tanks.

The ORVR system controls emissions from working and transferring/refueling losses in the vehicle fuel tank. In this edition of the Desert Breeze, we will cover the last system called In-Station Diagnostics or ISD.

### What is ISD?

ISD systems continuously monitors vapor recovery equipment to ensure it is functioning normally. The ISD system runs pressure tests, identifies leaks,



generates warnings/alarms notifying operator, provides test reports, and shuts down site upon occurrence of certain alarms. Since 2010,

California requires that ISD systems be installed at facilities with dispensing throughputs of 600,000 gallons or more.

### How ISD Works?

ISD consists of the following components:

- Vapor Flow Meter: (one per dispenser) measures the amount of gasoline vapor flow returning from vehicle.
- Vapor Pressure Sensor: (one per station) monitors system pressure.
- Tank Inventory Probe: (one per tank) measures fuel level, vapor space, and detects deliveries.
- Console and Monitoring Software: collects data during dispensing events, performs leak tests, notifies operator, and yields test reports.



### Types of Alarms:

- Warning (W) - Warnings indicate when equipment has a probability of malfunctioning and can be used by GDF operators to identify trends.
- Fail (F) - When equipment has a high certainty of non-compliance with specific requirements, ISD systems will post a failure and shut down dispensing.
- Degradation Collection Failure (D) - Two consecutive degradation test warnings over a 14-day period will result in a degradation collection alarm, failure event recorded, and will shut down dispensing.
- Gross Collect Failure (G) - Two consecutive 1-day periods of gross test failures will result in a gross failure alarm, failure event recording, and will shut down dispensing at all fueling points.

### How ISD Reduces Emissions?

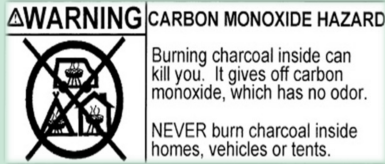
- ISD reduces emissions by detecting leaks early. The system also immediately notifies operator and can shut dispensing operation leading to prompt repairs. The system also supplements District inspections.

Displayed Message	ISD Monitoring Category	Light Indicator	Description	Suggested Troubleshooting <sup>1</sup>
ISD VAPOR LEAKAGE WARN	Containment	Yellow	Containment system leaks at 2 times the TP-201.3 standard	• Troubleshooting Guide <a href="http://www.vsthouse.com/carbs_components.aspx">www.vsthouse.com/carbs_components.aspx</a>
ISD VAPOR LEAKAGE FAIL <sup>2</sup>	Containment	Red	8th Consecutive Failure of Pressure Integrity (Vapor Leak) Test	• Exhibit 4 • Exhibit 14 (when FFS-CAS is installed)
ISD GROSS PRESSURE WARN	Containment	Yellow	95th percentile of 7-days' ullage pressure exceeds 1.3 IWC	• VST Processor • Troubleshooting Guide <a href="http://www.vsthouse.com/carbs_components.aspx">www.vsthouse.com/carbs_components.aspx</a>
ISD GROSS PRESSURE FAIL <sup>2</sup>	Containment	Red	8th Consecutive Failure of Gross Containment Pressure Test	• Exhibit 9 • Exhibit 10 • Check pressure sensor ball valve for correct position.
ISD DEGRD PRESSURE WARN	Containment	Yellow	75th percentile of 30-days' ullage pressure exceeds 0.3 IWC	• FFS-CAS Troubleshooting • Check FFS-CAS ball valves for correct positions.
ISD DEGRD PRESSURE FAIL <sup>2</sup>	Containment	Red	31st Consecutive Failure of Degradation Pressure Test	• Veeder Root Polisher • Check vent stack ball valve for correct position. • Check pressure sensor ball valve for correct position
hnn: FLOW COLLECT WARN	Collection	Yellow	Vapor collection flow performance is less than 50%	• Troubleshooting Guide <a href="http://www.vsthouse.com/carbs_components.aspx">www.vsthouse.com/carbs_components.aspx</a>
hnn: FLOW COLLECT FAIL <sup>2</sup>	Collection	Red	2nd Consecutive Failure of Vapor Collection Flow Performance Monitoring Test	• Exhibit 5 • Exhibit 6 • Exhibit 17

By: Miguel Sandoval, Air Quality Engineer

# Indoor Safety

As the weather turns colder we spend more time indoors. The holiday season is upon us; therefore, let's touch on a few things we can do to be safer this time of year. In January and February 2022, Texas



experienced an overwhelming freeze that caused a reported 246 deaths. About 8%, or 19 deaths, resulted from carbon monoxide poisoning

because of the “inappropriate” use of generators, grills, heaters, and automobiles. Incorrectly tuned heaters, automobiles, and generators can generate elevated levels of carbon monoxide. Additionally, a charcoal grill should **NEVER** be used indoors. Insufficient ventilation of carbon monoxide can lead to death.

One of the holiday culinary delights is fried turkey. **NEVER FRY A TURKEY**

**INDOORS!** There are two reasons for this exclamatory remark. The flame used to heat a fryer oil is not designed for indoor use and may generate high levels of carbon monoxide (see heaters above).



Additionally, there is a significant fire hazard associated with frying a turkey, and should be

done outdoors in a non-combustible area. You don't want your culinary delights to end up in a trip to the hospital emergency room or a call to the fire department.



Christmas trees are a bright and wonderful part of the Christmas holiday. A natural Christmas tree provides a wonderful ambiance and natural fragrance. When you buy your tree, make sure it is freshly cut so the water will be easily absorbed.

Also, you must frequently check the water level to assure the tree stays nice and moist. A dry tree is a fire hazard. Once again you don't want your holiday season ending with a call to the fire department.

Because it is colder outside during the winter months, we don't often open the windows to allow fresh air to enter. You may want to invest in an indoor air purifier for cleaner indoor air during the winter months. Just a few safety tips for the holiday season. As always, be safe.



*By: Glen Stephens, Air Pollution Control Officer*

# Cleaner Air

“Christine Todd Whitman, who led the Environmental Protection Agency at the time of the 9/11 terror attacks, apologized ... In the days and weeks after the attacks, Whitman told New Yorkers that the air was safe to breathe... Many first responders and others who lived and worked in the area have since been diagnosed with chronic respiratory illnesses or cancer related to their exposure to toxins released at Ground Zero.” (2016, TIME)<sup>1</sup>

Who and what deems air to be safe or clean? The definition of healthy air is based on exposure (concentration for a given period of time). The US Environmental Protection Agency (EPA) and the Air Resources Board (ARB) have established Ambient Air Quality Standards for several different air pollutants. Air is considered healthy if the concentrations for a specific duration of all these pollutants are below the standards. The definition of healthy air only applies to Criteria Air Pollutants: Ozone, Particulate Matter (PM<sub>10</sub> & PM<sub>2.5</sub>), Carbon Monoxide, Lead, Sulfur Dioxide, and Nitrogen Dioxide.

The California Ambient Air Standards were established before the federal standards, and they are more stringent. They were established so that there are few if any adverse responses from

any segment of the population. Eastern Kern Air Pollution Control District (EKAPCD) is one of California's thirty-five local air districts that are primary partners in efforts to ensure that all Californians breathe clean air. EKAPCD has regulatory Ozone and Particulate Matter Monitors in Ridgecrest, Canebrake, and Mojave (CARB owned and maintained monitors). EKAPCD data reports that the annual PM<sub>10</sub> and PM<sub>2.5</sub> averages for all three locations (Ridgecrest, Canebrake, and Mojave): have been on a downward trend since 2021. According to the Air Quality Meteorological Information System (AQMIS), Eastern Kern's Ozone National Design Value decreased from 86 ppb in 2020 to 73 ppb in 2022.

1. Reilly, Kate. “September 11th Attacks: Former EPA Head Apologizes.” *Time*, Time, 10 Sept. 2016, [time.com/4486557/epa-leader-apology-911-september-11-air/](http://time.com/4486557/epa-leader-apology-911-september-11-air/).

*By: Heather Handy, Air Quality Specialist*



**Board of Directors**

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

Board of Directors usually meet once every two months starting in January at the District’s Board Room, 414 W. Tehachapi Blvd., Suite D, in Tehachapi. The Meeting Agenda can be located on the District website [www.kernair.org](http://www.kernair.org), under the “Board” tab.

**Air Pollution Control Officer**

Glen E. Stephens, P.E.



**Hearing Board Members**

Doris Lora  
Chris Ellis  
Benjamin Dewell  
Brett Moseley  
Brenton Smith



For news updates and other information, please visit the Eastern Kern APCD website at [www.kernair.org](http://www.kernair.org)

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

