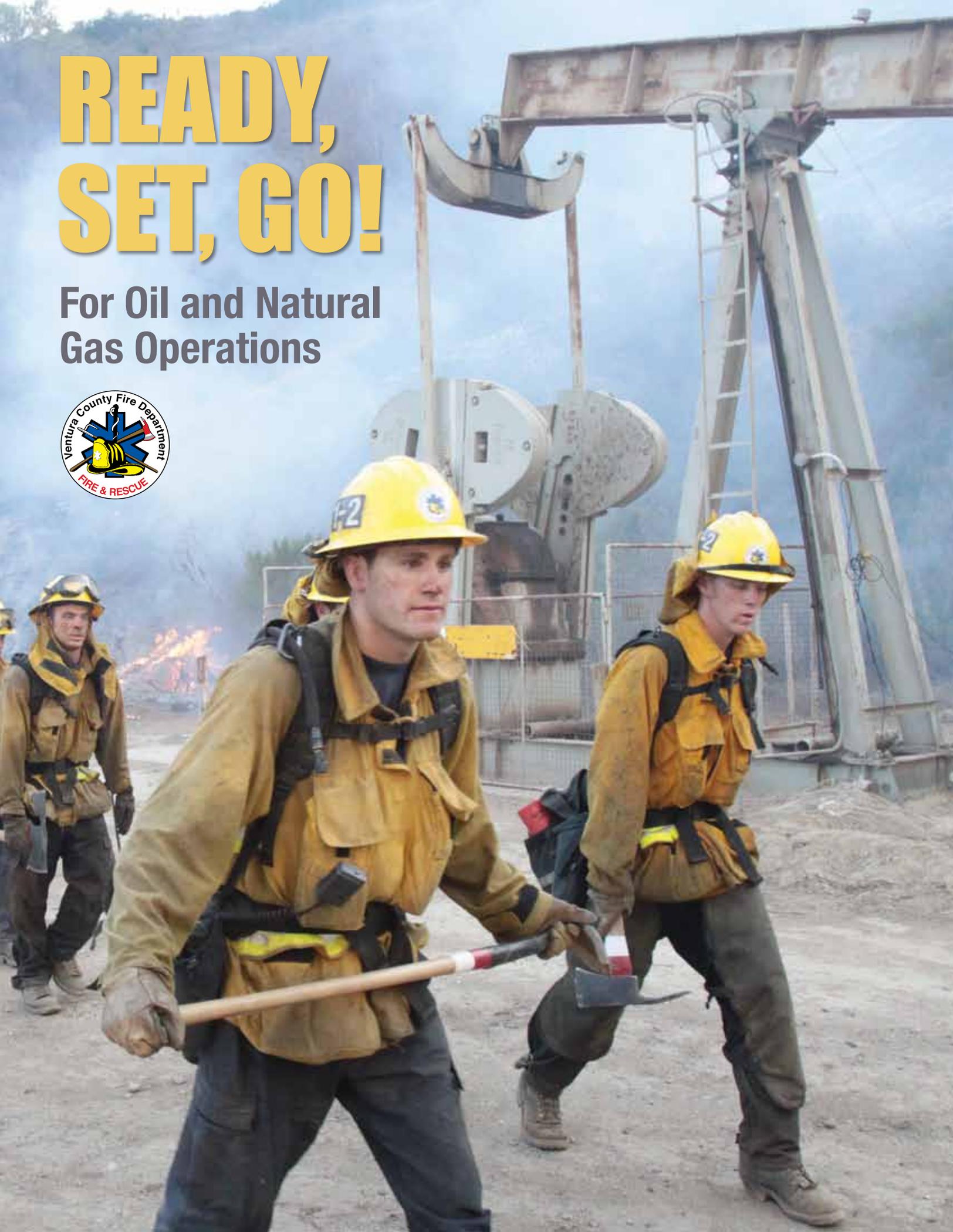


READY, SET, GO!

For Oil and Natural
Gas Operations



READY, SET, GO!

Wildfire Preparedness for the Oil and Gas Industry Saving Lives and Assets By Planning Ahead



Mark Lorenzen, Ventura County Fire Chief

For more than 150 years, the oil industry has been a critical element of Ventura County's economy. The industry is even more important today than it was in the 1860s during its early exploration and production efforts. Protecting these valuable facilities and infrastructure is a strategic goal of the Ventura County Fire Department.

Much of the oil field infrastructure in Ventura County is vulnerable to wildfires and that means the employees who work there are too. Large numbers of oil and gas production and storage sites are located on hillsides surrounded by natural vegetation. That puts these properties at risk from both the flaming front of an advancing wildfire and the embers it produces.

The purpose of this brochure is to give anyone who works in the oil fields, or has reason to visit, the information they need to protect themselves and the property. We're grateful to the oil companies in Ventura County for their assistance in providing industry-specific information for this brochure that will help protect oil field workers.

The Ventura County Fire Department is committed to a partnership with the oil and gas producing companies – and the related businesses – to protect the oil fields because we know that when a major wildfire occurs, we will simply not have enough fire engines and firefighters to protect every property. This is especially true during the early stages of a fire. We need property owners to do their part to protect their own assets and employees. This means providing us with defensible space where possible. And it includes maintaining roads, marking buildings and water supplies and upgrading bridges. This brochure will explain the measures oil and gas companies – big or small – can take to help ensure the safety of their people and property during a major wildfire. Wildfires are a year-round possibility in Ventura County, so it's not a matter of if, but when, the next fire will occur. The preparations you make now may save lives and assets.

Contents

Oil History	3
Ready, Set, Go! background	3
Defensible Space and Embers	4
Oil and Natural Gas Operations	5-6
Wildfire Action Plan	7
Checklist for Oil and Natural Gas Operations	8



Special thanks to Ready, Set, Go! for Oil and Natural Gas Operations sponsors:



VENTURA COUNTY FIRE DEPARTMENT
If you have an emergency, call 911
Public Information Office: 805-389-9769
Wildfire Hotline (during major wildfires only): 805-388-4276
Web site: <http://fire.countyofventura.org>
<http://vcreadyssetgo.org>

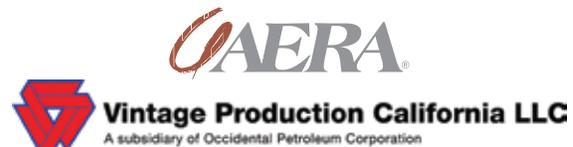


Photo credits:

Ventura County Fire Department,
Aera Energy LLC and the California Oil Museum

The Oil Industry in Ventura County

Oil exploration and production is one of the industries that helped shape Ventura County. The very first commercial oil operations in the region were hugely successful and the oil industry is still big business here.

Speculation in oil began in what was to become Ventura County during the 1850s. There were numerous natural oil seeps in the area and they seemed like obvious opportunities. The Chumash and other residents had been using this surface oil for years as a lubricant or as a waterproofing agent. When an oil discovery in Titusville, Pennsylvania in 1859 launched the oil industry, speculators soon flocked to our hills and canyons to tap the oil deposits here.

In the mid-1860s tunnels were dug into the southern slopes of Sulphur Mountain to reach oil deposits. Oil flowed out of the tunnels by gravity and created one of the largest oil-producing areas in the state. But deep-well drilling techniques would soon change the industry forever.

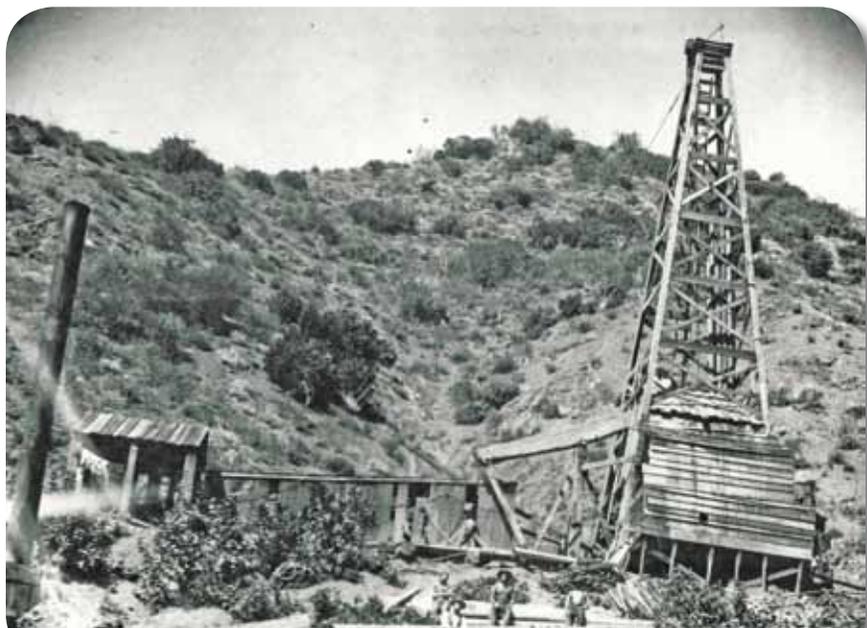
Thomas R. Bard drilled his first well on the east bank of San Antonio Creek in 1866, but it wasn't until the 1880s that the industry truly thrived in Ventura County. Lyman Stewart and Wallace Hardison, who would eventually form the Union Oil Company (now Unocal), made their first discovery in Adams Canyon in 1884.

By 1887 they were producing 50,000 barrels a year and built the first oil refinery on the West Coast in Santa Paula. Then, in January of 1888, the company hit California's first "gusher" in Adams Canyon and the rush was on.

In the years since, numerous companies have conducted operations in the county with most of the activity in the Santa Clara River Valley, and the South Mountain, Sulphur Mountain and Red Mountain areas. There are numerous offshore sites as well.

The frenzy of those early days is gone now, but oil wells still dot many of the hillsides and canyons in the county and are still producing oil and natural gas. And the oil industry remains a critical part of the economy in Ventura County employing more than 7,000 people and generating over \$171 million in state and federal tax revenue. Currently, there are estimated to be more than 1,700 wells in Ventura County producing more than eight million barrels of oil every year.

The Ventura County Fire Department has been protecting this valuable and historic industry since 1928.



Ready, Set, Go!

Wildfire is now a year-round reality in Ventura County and some of the areas most at risk may be oil and gas operations. Many oil field properties border natural areas and have access challenges and assets that are difficult to protect from an advancing wildfire. This *Ready, Set, Go! for Oil and Natural Gas Operations* brochure is designed to help operators meet those challenges and protect their property and livelihood.

Ready, Set, Go! is an award-winning, three-step program that was initially developed to help homeowners prepare their property and families against the threat of wildfires. The program has now been expanded to include many other types of property at risk from wildfires, including oil and natural gas operations. The program is simple: **Ready** – teaches how to create defensible space and prepare property and structures to resist a wildfire. It also shows how to assemble emergency supplies and establish evacuation routes. **Set** – teaches situational awareness during fire weather (early preparations to property, assembling what is needed to take if evacuated, monitoring property for embers and monitoring the media for fire updates). And, **Go!** – encourages people in wildfire-prone areas to leave early, well before the fire arrives. For many oil and gas operators, wildfires threaten their businesses as much as their lives. This brochure addresses the *additional* measures they can take to help keep a wildfire from destroying their property and businesses.

It is critical to understand that oil field properties may be at risk from a wildfire even if the fire itself is some distance away. Numerous studies have shown that much of the property loss suffered during wildfires is the result of ember fallout or intrusion and not from the fire itself. In a wind-driven wildfire, typical during Southern California's Santa Ana wind season, winds can carry embers a mile or more ahead of the main body of the fire. This brochure will help oil and gas producers assess their risk from wildfire embers.

For more information on emergency supplies, home and structure preparation, and evacuation planning, please visit the *Ready, Set, Go!* website at <http://vcreadyssetgo.org>, or see the *Ready, Set, Go! Wildfire Action Plan* brochure that is available at all Ventura County fire stations and on the website.



Defensible Space & Embers

Ready, Set, Go! Begins with Property that Firefighters can Defend. Defensible Space Works!

Defensible space is a buffer zone that is created when weeds, brush and other natural vegetation are removed between an area of natural vegetation and assets at risk from a wildfire. It gives firefighters a place to operate between the asset and an advancing wildfire. In a suburban setting, this is usually a straightforward matter of weed abatement. But defensible space takes on different characteristics in an industrial complex like an oil field.

Oil fields may require very large areas of defensible space due to the surrounding vegetation and topography. Additionally, oil and gas infrastructure such as pipelines, power poles, electrical equipment, storage facilities, office structures, trailers and fuel supplies are particularly susceptible to flames or wind-driven embers. As a result, operators must carefully assess their property, paying particular attention to fire history and topography, to determine how much defensible space is desired. Local engine companies can assist in this risk assessment.

Defensible space can be achieved by cutting back weeds and vegetation, building firebreaks or clearings, or by using fire-resistant plants or other landscaping to create a barrier. Large, cleared areas around wells, tanks and other facilities not only provide defensible space, they may also be used as a refuge area when there is extreme fire behavior.

It is typically not practical to clear large areas of vegetation from around pipelines, but eliminating weeds and brush immediately adjacent to the pipeline can reduce direct flame impingement. It also makes the pipelines easier to see in dark or smoky conditions. This is especially important if bulldozers are being used to construct fire breaks.

Defensible space is an important tool against an advancing wildfire, but it is not enough. Special attention must also be given to wind-driven embers. These embers are often pushed more than a mile ahead of the flaming front of a fire by strong Santa Ana (east) winds that are typical in the late summer and early fall in Ventura County.

Operators must be aware of the dangers flying embers pose to their vehicles, structures, and other production or storage assets. Embers that land or blow into roofs, storage areas or near fuel or hazardous material storage can start deadly and destructive fires. Defensible space can help to keep these fire from spreading into the brush or to other assets.

Ready, Set, Go! begins with a property that firefighters can defend.



Many oil field and natural gas operations in Ventura County are at risk from wildfires because of their relatively remote locations and their proximity to natural vegetation. Some of these oil and gas operations are also situated on mountainsides or in deep canyons where they are susceptible to having evacuation routes cut off by fire. Because of this, operators must work diligently to prepare their properties and make contingency and evacuation plans for workers, contractors and the employees of service businesses.

READY Before a fire occurs

Prepare Personnel:

Pre-planning is a critical component of wildfire preparedness. Because of differences in location, accessibility, topography and vegetation, each site should have its own Wildfire Action Plan and anyone working at the site should know how to find the plan if a fire should occur. Contractors and visitors should also be briefed on what to do if a fire starts. Each plan should include:

- Evacuation Routes
- Safe Refuge Areas
- Meeting Locations (to account for personnel)
- Company (wildfire) Safety Policies and Procedures
- Communication Plans and Important Numbers
- Location of Emergency Supplies (food, drinking water, first aid)
- Location of Firefighting Supplies (for extinguishing embers and small fires)
- Location of All Applicable Emergency Shut-Offs

Prepare Work Sites:

Wildfires often produce very thick smoke with low to zero visibility, and usually occur during very hot, dry and windy conditions. This can make navigating even familiar locations difficult. Properly preparing a property can assist employees during an emergency and make it easier for incoming firefighters to access the property to protect it and employees or visitors.

Because of the remote or difficult-to-access locations of many oil operations, safe evacuation of employees and others may not be feasible. As a result, operators should consider establishing temporary refuge areas where employees can find a relatively safe haven while a wildfire burns through.

Open areas around wells and collection sites can be enhanced for safety by cutting back nearby brush. This not only reduces the risk from embers, it provides additional defensible space and creates a larger area of safety should a fire approach. These areas should only be used as a last resort and if evacuation is not possible.

Safety areas should also be created for equipment and vehicles. These areas should be clear of brush and other combustibles and provide enough defensible space for firefighters to safely work between the vegetation and the equipment.

- Make sure the main driveway and gate is clearly marked with an address that is legible even in low light or smoky conditions.
- Consider having spare gate keys or combinations, and a facilities map available for firefighters as they arrive. This can reduce response time.
- Place directional signs to critical locations and at key intersections. Clearly mark road names or designations and individual sites.
- Create defensible space around all structures and critical infrastructure. This would include removing brush from around pipelines and power poles.
- Clear brush and debris from around structures and other permanent assets. Leaves and tumbleweeds can accumulate under trailers, in rain gutters, on roofs and beneath porches or decks. These kind of accumulations are very susceptible to ignition from embers.
- Remove, fence-off, or clearly mark abandoned or obsolete infrastructure that could be a hazard to employees or firefighters under dark or smoky conditions.
- Clearly mark water tanks, hydrants, ponds or other water sources that are available for fire department use.
- Mark pipelines on the surface or buried just below the surface that could be struck by bulldozers during firefighting operations.
- Clearly mark where flammable or poisonous liquids or gases may be present.
- Clearly mark all areas where explosives are stored, particularly if they may be detonated by the use of two-way radios.
- Consider the installation of firefighting equipment in at-risk areas.
- Reinforce bridges to make them capable of supporting the weight of a fire engine or bulldozer and clearly mark weight limits or bridges that are unsafe. Mark alternate paths around the bridges if they are incapable of supporting heavy weights.
- If possible, provide turnout or turn-around areas on narrow roads. This will allow company vehicles and incoming fire apparatus to safely pass.

Remember: During a major wildfire, the fire engines responding to a facility might be from other jurisdictions and may not have any local knowledge. Clearly marked addresses, roads and water supplies will save valuable time.



Oil & Natural Gas Operations

SET As the fire approaches

Firefighters are trained to constantly be aware of their surroundings. By monitoring the conditions around them, it helps them to identify possible hazards before they become dangerous. This is called situational awareness.

Situational awareness is important for workers in oil and natural gas facilities as well. It is critical that employees recognize the conditions for high fire danger. Although a wildfire can occur at almost any time under a variety of weather conditions, typical “fire weather” in Ventura County is hot, dry, and windy. When these conditions exist, employees should begin preparing for a wildfire, whether or not there is actually a fire burning in the area.

- Locate and review evacuation plans and emergency procedures.
- Load vehicles with emergency supplies, valuables and essential documents. Be ready to evacuate if ordered.
- Make sure all vehicles have emergency supplies in case employees become separated or trapped.
- If possible, reschedule “hot work” including welding, grinding, soldering and anything else that might produce a spark or flame. If hot work must be completed when “red flag” or fire weather conditions exist, designate another employee as a fire watch who can use onsite fire equipment, monitor sparks and ensure that combustibles and fuel sources are removed or protected from the operation. Hot work should be shut down if strong winds are present. Any vegetation near the hot work should be kept wet at all times and spark control measures such as curtain deflectors should be used. The work site should be monitored for at least one hour after the hot work is completed.
- Stay hydrated.
- Keep all employees and other personnel informed of changing conditions.
- If you see a fire, call 911 immediately, before attempting any mitigation or suppression efforts.
- If a fire is approaching, evacuate all non-essential personnel.
- Account for all personnel on the property, including employees, contractors, vendors and visitors.
- Unlock and/or open gates so firefighters have easier access and evacuation routes are not blocked.
- Mid-slope roads and sites are particularly hazardous locations during a wildfire. They should be evacuated as early as possible.
- If possible, appoint a company representative to work with the fire department. This person should be familiar with the facility and the equipment on it.
- Move equipment and vehicles to safe zones.
- Close all doors and windows and turn on lights in structures and offices.
- Monitor property for ember fallout and small fires started by embers.
- Monitor radio, television or Internet for fire and weather updates.



GO! Leave early

Numerous studies have shown that most fatalities in wildfires occur when people wait too long before evacuating and are overcome by the fire. Do not wait to see how the fire behaves. It may come very quickly and close evacuation routes.

Late evacuation can also cause congestion on steep, narrow oil field roads as firefighters attempt to reach the fire. Additionally, heavy smoke and ash and ember fallout can reduce visibility to dangerous levels, making driving extremely hazardous.

Follow all company safety procedures and policies and then, if the workers and property have been properly prepared, the best thing to do is to evacuate well ahead of the fire’s arrival and let the firefighters do their job.

Remember: If you choose not to evacuate, you must know that severe fire behavior could prevent firefighters from reaching you if you need to be rescued.

If you are trapped by a fire, or unable to evacuate:

- Wear appropriate clothing – long sleeves and pants made of natural fibers such as cotton. Boots, gloves, hats, goggles and bandanas are also good protection against smoke and embers.
- Stay hydrated.
- Patrol buildings and property for spot fires caused by embers.
- Fill sinks and tubs with water as an emergency supply.
- As the main body of the fire approaches, take refuge inside a structure, away from outside walls.
- Bring hoses inside to protect them from ember damage.
- Place wet towels under doors to keep smoke and embers out.
- Do not go outside until the fire has passed. It will be very hot and uncomfortable inside, but it will be much worse outside.
- If possible, alert other employees to your location and stay in contact.
- After the fire has passed, check roofs and patrol the property to extinguish small fires.
- Call 911 if the fires are too large or there are too many for you to handle.



Write up your Wildfire Action Plan and post it in a location where everyone can find it

Wildfire Action Plan

During High Fire Danger days in your area, monitor your local media for information on brush fires and be ready to implement your plan. Hot, dry and windy conditions create the perfect environment for a wildfire.

Communication Plan and Important Phone Numbers:

Contact: _____ Phone: _____

Contact: _____ Phone: _____

Evacuation Routes and Meeting Locations: _____

Safe Refuge Area(s) When Evacuation is Not Possible: _____

Location of Emergency Supply Kit: _____

Location of Firefighting Supplies: _____

Location of Emergency Shut-Offs: _____



VENTURA COUNTY FIRE DEPARTMENT

If you have an emergency, call 911

Public Information Office: 805-389-9769

Wildfire Hotline (during major wildfires only): 805-388-4276

Web site: <http://fire.countyofventura.org>

<http://vcreadyssetgo.org>.

Ready, Set, Go!

Checklist for: Oil and Natural Gas Operations

Ready (Before a fire occurs)

- Create a Wildfire Action Plan for each site.
- Know your evacuation routes and make sure all important turns are clearly marked.
- Assemble emergency supply kits for all facilities, buildings and vehicles. Include lots of drinking water.
- Make sure the property address is clearly marked (and visible even at night).
- Establish and maintain brush clearance (defensible space) around structures, wells, storage tanks, compressors, traps and other infrastructure.
- Properly mark all storage areas used for chemicals, hazardous materials or explosives.
- Clearly mark water tanks, hydrants, ponds or other water supplies that could be used for firefighting.
- Place directional signs identifying critical locations and at key intersections.



Set (As the fire approaches)

- Locate and review evacuation plans and emergency procedures.
- Notify appropriate company contacts.
- Load vehicles with emergency supplies, valuables and essential documents or equipment. Park vehicles facing out, or facing downhill, and be ready to evacuate if ordered.
- Reschedule or cease all “hot work.”
- Account for all personnel on the property, including employees, contractors, vendors and visitors.
- Unlock and/or open gates.
- Move equipment and vehicles to safe zones.
- Close all doors and windows and turn on lights.
- Monitor property for embers and small fires started by embers.
- Monitor radio, television or Internet for fire and weather updates.
- Stay hydrated.
- Keep all employees and other personnel on the site informed of changing conditions.



Go! (Leave early)

- Evacuate non-essential employees as early as possible. Evacuate ALL workers if conditions warrant. Do not wait to see how the fire behaves. It may arrive very quickly and close evacuation routes.

Remember: If the facility has been properly prepared, the best thing to do is evacuate and let the firefighters do their job. If employees choose not to evacuate, they need to know that severe fire behavior could prevent firefighters from rescuing them.

If you are trapped by fire or unable to evacuate:

- Boots, gloves, hats, goggles and bandanas are good protection against smoke and embers.
- Stay hydrated.
- Patrol buildings and property for spot fires caused by embers.
- As the main body of the fire approaches, take refuge inside a structure, away from outside walls.
- Bring hoses inside to protect them from ember damage.
- Do not go outside until the fire has passed. It will be very hot and uncomfortable inside, but it will be much worse outside.
- If possible, alert other employees to your location and stay in contact.
- After the fire has passed, check roofs and patrol the property to extinguish small fires.
- Call 9-1-1 if the fires are too large or there are too many for you to handle.

