PREVENTING WILDFIRES WITH LONG-TERM FIRE RETARDANTS

TEXAS FIRE CHIEFS ASSOCIATION
April 15, 2025

Texas by the Numbers

- **In 2023 Texas had 7,102 wildfires with 210,264 acres burned, well below an average year.** [1]
- **Texas' current population is 31 million people. By 2036, Texas' population is estimated to be between 3 and 5 million people.**
- Texas A&M cites three reasons that wildfire conditions in Texas will continue to worsen [5]:
  - ✓ **Population growth:** The **Texas population grew 40% from 2000 to 2020**. [6]
  - ✓ **Changes in land use:** **Texas A&M reports that 62% of the state's population and housing units have wildfire exposure.** Approx. 86% of wildfires start within two miles of a community. More people = more opportunities for fire. [5, 7]
  - ✓ **Changing weather patterns:** The summer of 2023 was Texas' second hottest on record at an average temperature of 85.3°. In 2023, there were 69 days of 100+ degree weather in Austin, vs. a 30-year median of 26 days.[11] Texas A&M recently announced that **2024 was the warmest year in Texas in 130 years**, with drought conditions continuing to persist into 2025.

Texas by the Numbers

- **There are nearly 245,000 homes in Texas with moderate or greater wildfire risk**, third highest of any state. *CoreLogic's 2024 Wildfire Risk Report
- **Austin is the fifth most city for wildfire risk of any city in the US** (94,673 homes; $40.6B reconstruction value), the first city listed outside of California. **San Antonio ranked seventh** (78,207 homes; $29.1B reconstruction value). [2,3]
- **Since 2006, there have been ~3,500 Red Flag Warnings issued across Texas** by the 13 regional Weather Forecasting Offices. The Austin/San Antonio WFO has issued 246 Red Flag Warnings over the same period, for an average of ~12 Red Flag Warnings per annum [12]
- Across Texas, there are more than 1,842 local fire departments — 1,307 volunteer departments, 337 combination departments, 194 paid departments and 4 industrial/private departments.

Utility Related Wildfire Risk

- Bastrop Complex (the most destructive fire in Texas history) and Smokehouse Creek Fires (the largest fire in Texas history) both ignited by power lines.
- From 2014 through February 2024, there have been 6,145 utility caused wildfire events in the State of Texas alone, burning 1.7 million acres.
- Due to population growth through 2040, ERCOT projects Texas will require 1,350 miles of new transmission capacity.
- Unregulated oilfield power lines are the cause of devasting wildfires
- **Utility companies have and will continue to face increasing risks in the following areas due to wildfires:**
  - ✓ Public and first responder safety
  - ✓ Egress of community evacuations
  - ✓ Loss of service to customers
  - ✓ Loss of critical infrastructure
  - ✓ Increase in insurance costs/challenges arising from insurance dropping coverage
  - ✓ Significant monetary damages from replacement of equipment, penalties/fines, liability and lawsuits
  - ✓ Financial difficulties arising from rating downgrades due to wildfire events

WPC Complete Suite of Solutions for Governments, Businesses and Homeowners

- **Exclusive distributor/service provider of PHOS-CHEK long-term fire-retardant application for Texas**
  - ✓ Proven fire prevention & protection for over 60 years
  - ✓ Environmentally safe and easily ground applied via truck, ATV, backpack sprayer, or aerial
- **Facility Hardening**
  - ✓ Licensed BrandGuard Vent and Wildfire Defense Mesh installation
  - ✓ Both products aim to stop embers that destroy 90% of homes during wildfires. ASTM tested and WUI approved for fire-prone areas. Both are listed on Austin's approved WUI product list
- **Custom Property Assessments & Remote Sensing Analysis**
  - ✓ Focused on assessing homeowner's property for wildfire risks and creating/executing personalized mitigation plans
  - ✓ Remote sensing is an analysis service we use to evaluate ecological factors (of topography, vegetation type, vegetation health, and vegetation moisture) to identify potential fire hazards by using airborne LIDAR and government satellites
- **Community Wildfire Protection Plan Support**
- **Community Wildfire Defense Grant Support**
- **Tree Service and Land Work**
- **Reseeding/Hydroseeding**

BrandGuard Vents

- **ABOUT BRANDGUARD VENTS:**
  - ✓ Invented in 2003 by a firefighter in San Bernadino, CA who personally witnessed the vulnerability of most homes during a fire – embers flying into typical vents.
  - ✓ Studies show that 90% of homes destroyed during a wildfire resulted from embers flying from up to a mile away from the actual fire.
  - ✓ BrandGuard Vents are so effective that new homes constructed in the WUI in CA are required to install ember and fire-retardant vents.
  - ✓ Insurance Institute for Business Home Safety Research Center Ember Test

- **BRANDGUARD PANTENTED THREE-PRONGED APPROACH:**

1) Baffle design to trap embers using stainless steel mesh.

2) Proprietary intumescent material expands, sealing off vents exposed to high heat or flames.

3) Vents are constructed from non-combustible, 26ga metal materials.

WPC is the exclusive provider of BrandGuard vents in Texas

Wildfire Defense Mesh

- **ABOUT Wildfire Defense Mesh:**
  - ✓ Created in Australia after their devastating wildfires in 2008 and 2009.
  - ✓ A patent pending stainless steel design, is both ember-defending and heat-reflective.
  - ✓ Approved by California building code, Wildfire Defense Mesh meets the requirements of the CBC, Chapter 7A 706A.2 tested to ASTM E2886 and is listed by QAI Laboratories.
  - ✓ Meets the US Building standards for Class A fire rated product, flame and ember resistance, and flame impingement.
  - ✓ Tested to stop a minimum of 98% of dangerous embers and reduces radiant heat by 38%.
  - ✓ One of the lowest cost wildfire retrofitting available.

WILDFIRE™ DEFENSE MESH U.S. Patent Pending

PHOS-CHEK Long-Term Retardant

- **PHOS-CHEK long-term fire-retardant products by Perimeter Solutions have been used in fire fighting for 60+ years and are primarily used for both direct and indirect attack of wildland fires.**
- The phosphate-based concentrate is easily used, making storage, training and application simple.
- **The product can be applied days/weeks/months before a fire happens, providing a safe and preventative solution to utilize.**
- The mixture can be applied via aerial and ground application, water tender, truck-based sprayer, ATV based sprayer or even backpack sprayer.
- Once applied, it remains effective until washed off by significant rains, and works both wet or dry. It does not require additional water for re-hydration after application like traditional Class A foams.

WPC Sample Project

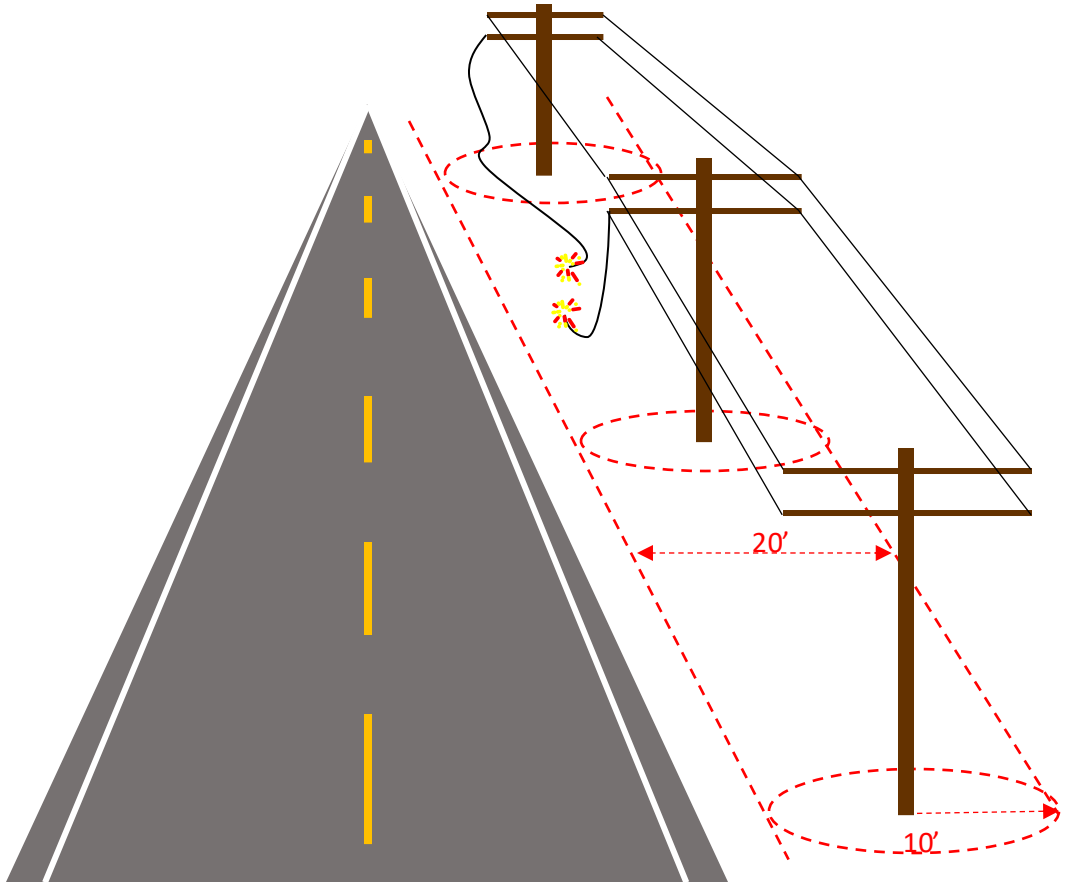
WPC would propose a project to limit two main risk factors:

1) Mitigate the risk that utilities lines pose when combined with typically dry vegetation.
2) Reduce the loss of infrastructure and service to customers.

Agencies can identify high risk stretches of utility lines. WPC can clear necessary vegetation and apply PHOS-CHEK long-term fire retardant to treat wooden poles to protect capital investments, spraying a 10’ radius around the pole (per Cal Fire recommendation). Treatment can be limited to high-risk equipment, in high-risk situations.

Additionally, a 20’ wide firebreak would be suggested to run underneath high-risk lines so that even if an event occurs that would otherwise cause a fire, it will fall into the firebreak limiting further ignition. This doubles as added protection of roadside fires and emergency egress hardening.

WPC would advise Agencies to treat high-risk stretches of line both during peak fire seasons, as well as on an “as needed” basis when assessing ongoing weather and drought conditions.



Example of Treated Pole

Untreated

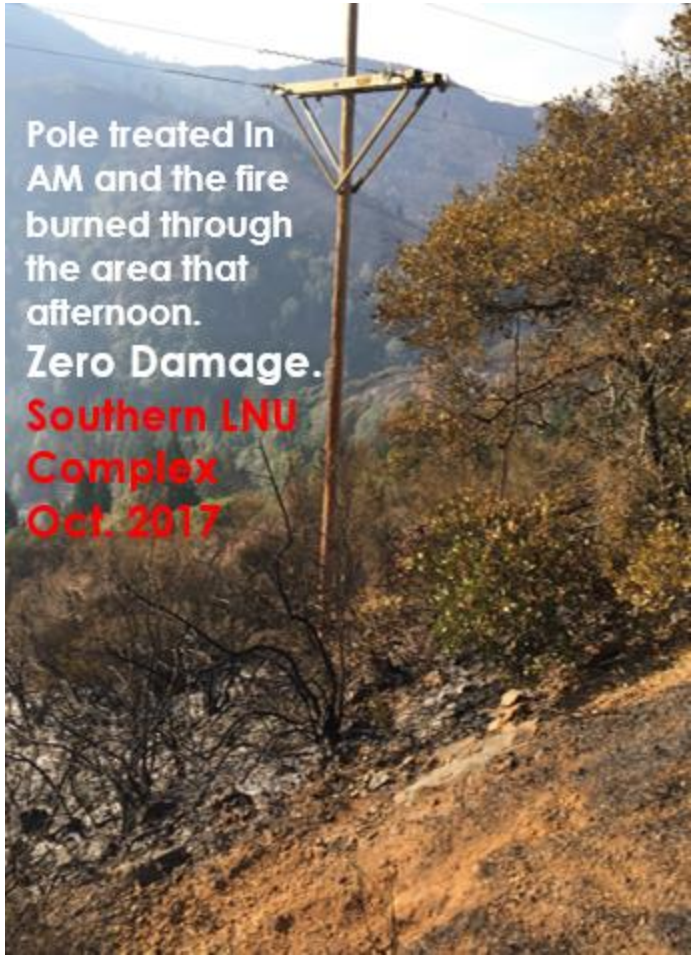
- Fire tested on left pole ignited when exposed to flame.
- The treated pole on the right had no damage. In addition,
- Treated vegetation adjacent to the pole did not burn.

Treated

PHOS-CHEK In Action

Treatment Before Fire

After Fire



Perimeter SOLUTIONS
Quality Products. Exceptional Response.

PHOS-CHEK AND THE EFFECTIVE USE OF LONG-TERM FIRE RETARDANTS

Early Days of Airtankers 1959 –1973

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

The TBM Avenger, a Grumman TBF manufactured by General Motors, began being used as a firefighting air tanker in 1958. The first TBM to drop retardant on a fire was Paul Mantz's TBF near Lake Elsinore, California. The TBM was well-suited to the role of air tanker because it was built to withstand the rigors of war.

To Current Aviation Assets

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

Agency Issues with Technology

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

- Agencies are still doing many things the same way they have done for many years.
- In the event new technology comes forth; there are challenges to research, testing approval, adopting and funding.
- Late to technology.
- Wait and see innovators.
- Example the DC-10 – Since 2006 to **Adopt a VLAT CW Exclusive Use Contracts.**
- Helicopter in the Early 1940's 1946 a Bell 47, **Heavy Lift Copters used in the 1980's Now the NORM.**
- Now flying night operations with NVG
  - ✓ Heavy CH47's
  - ✓ Firehawks and other Ships
  - ✓ SCE – ORC, LAC, VNC

Types of Suppressants Used in Wildland Firefighting

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

WATER: HEAT is absorbed during evaporation.

- Pros: No mixing required, easy application, safe to use
- Cons: Evaporates when exposed to heat, short-term effectiveness

FOAM: Expands water, increases insulation, penetrates deeper into the fuel layer and remains on fuel surface longer compared to water, and increases visibility.

- Examples: PHOS-CHEK® WD881, PHOS-CHEK® WD881C, PHOS-CHEK® First Response, FIRE-TROL 103\
- Pros: Highly effective for interior protection such as hangers and mop-up activities
- Cons: Short-term effectiveness compared to other retardants, not for larger scale projects

GEL (Water Enhancer): Increases amount of water reaching and clinging to fuel. HEAT is absorbed during evaporation.

- Examples: Insulate LC & Aqua-Gel K Powder
- Pros: Highly effective for direct application to structures
- Cons: Short-term effectiveness, not as applicable to vegetation, degrades in the environment, not for large scale projects

LONG-TERM RETARDANT: Clings to vegetation more than water. Retardant can be applied as a suppressant or a preventative

- Examples: PHOS-CHEK® LCE20-Fx, LCE20-W, PHOS-CHEK® MVP-Fx, PHOS-CHEK® 259-Fx
- Pros: Highly effective at vegetation mitigation, long-term application, great accuracy, great for large scale projects, ease of use, can be used both as both indirect and direct attack, environmentally friendly
- Cons: Not for direct application to structures or interior protection

Fire Chemical Tactical Effectiveness

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

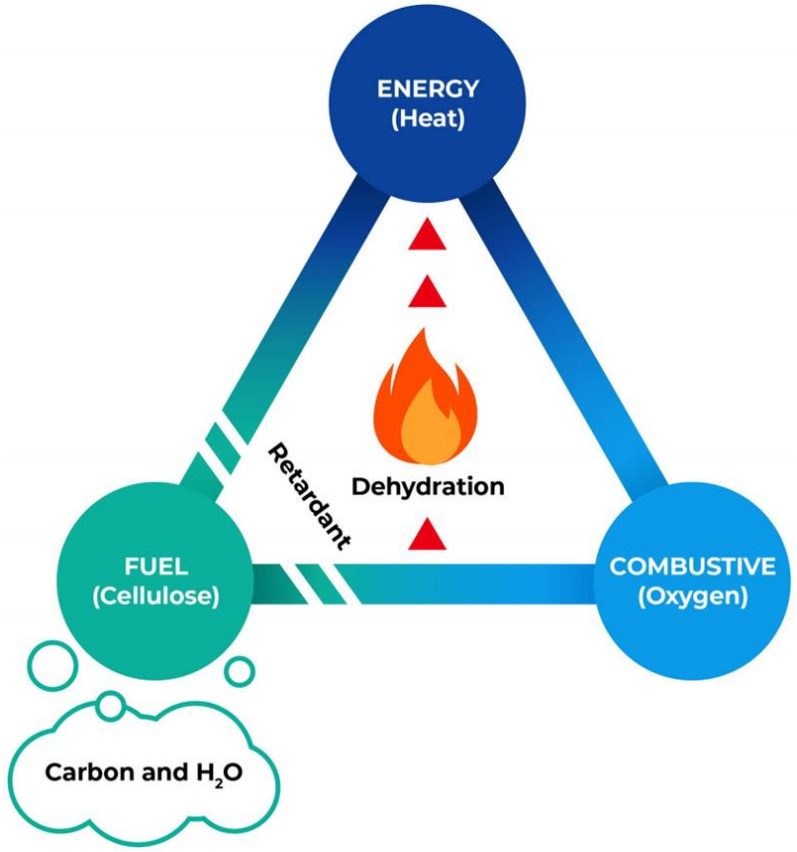
	Long-Term Retardant	Gel	Class A Foam	Water
Indirect Attack	✓✓✓✓	✓✓	✓	
Direct & Parallel Attack	✓✓✓✓	✓✓✓	✓✓	✓
Interior Structure Attack	n/a	✓✓	✓✓✓✓	✓
Structure Protection Indirect Application	✓✓✓✓	✓✓✓	✓✓	✓
Structure Protection Direct Application	✓✓	✓✓✓✓	✓✓✓	✓
Mop-Up	✓✓	✓✓	✓✓✓✓	✓
Prescribed Burn Control	✓✓✓✓	✓✓✓	✓✓	✓
	✓✓✓✓= Best	✓✓✓=Better	✓✓=Good	✓=Baseline Effective

Fuel Modifications

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

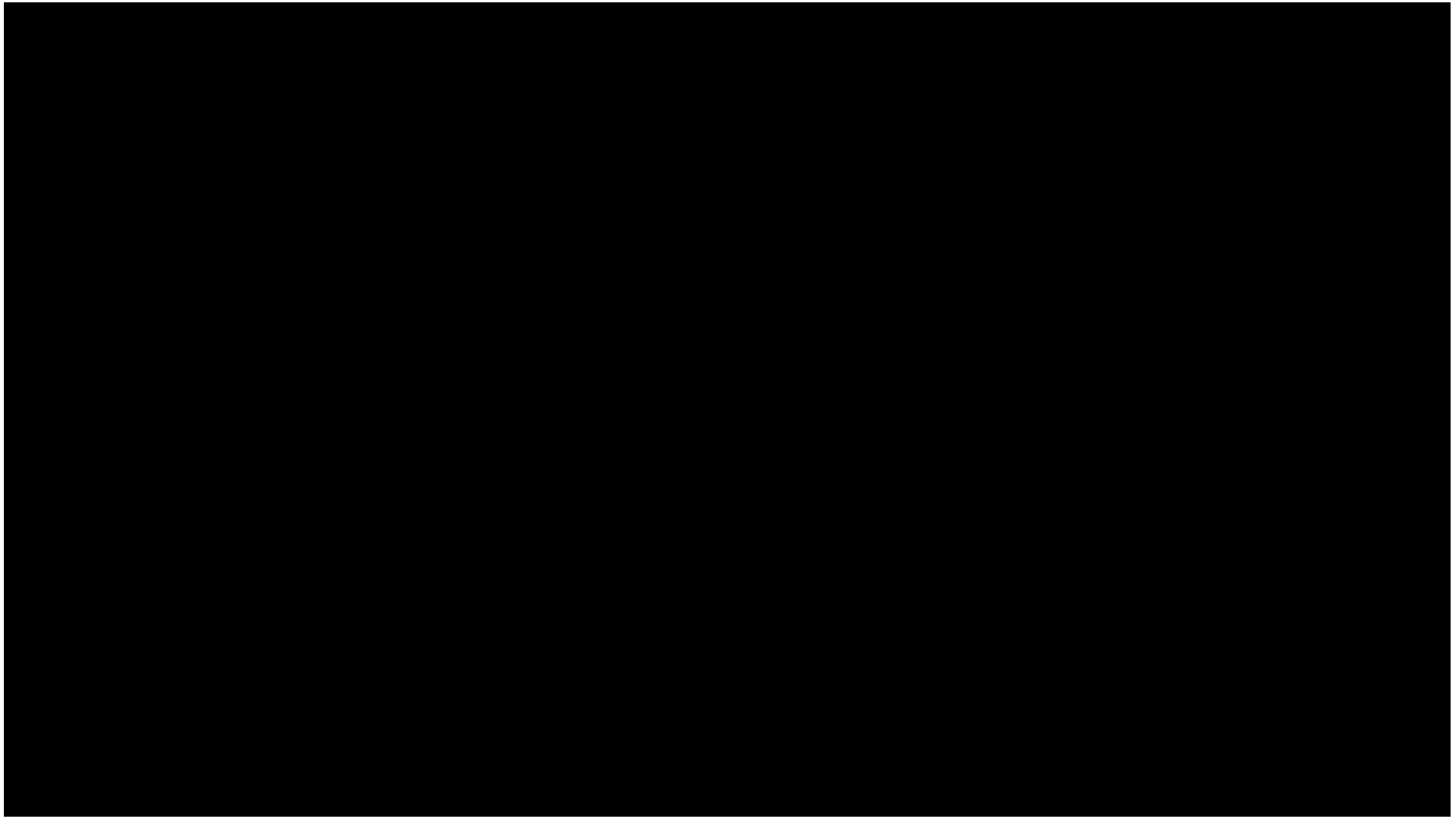
- Long-Term Retardant is designed to modify fuel to prevent ignition of vegetation – ground, ladder and canopies
- Long-term fire retardants work chemically, by altering the way cellulose decomposes when exposed to heat from a fire, rendering it non-flammable.
- When exposed to heat, long-term fire retardant creates a layer of non-flammable carbon char on vegetation, which will not support combustion

Fire Triangle



Prescribed Burn Demonstration

Perimeter SOLUTIONS
Quality Products. Exceptional Response.



Prescribed Burn After Photos

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

Agencies & Private Companies Use of Long-Term Retardants

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

Agencies based in the west have started to adopt a proactive approach to wildfire mitigation. The following agencies and private companies have begun to implement long-term retardants into their mitigation plans:

- **Utility Companies**
  - ✓ **Initially using Class "A" Wildland Foam, now using LTR on Utility Poles**
  - ✓ PG&E Safety Infrastructure and Protection Teams - 45 Type 6 engines with plans to expand to 60 Type 6 engines
    - ✓ It was reported that in one instance, 45,000 poles were sprayed down with fire retardant with a >90% success rate of saving them from burning.
  - ✓ Siskorsky Rotary Aircraft –Construction & Maintenance [Coop. in Marin & Butte County prepositioned]
  - ✓ Cooperative effort with [QRF] ORC, LAC, VNC
- Private Insurance
- Private Fire Businesses
- State and Federal Agencies

Environmental Education

- Forest Service approved products must go through rigorous environmental testing by the US Forest Service WFCS Missoula.
- Only approved products are listed on the Qualified Products list (QPL). Only QPL listed retardants can be used in California for wildland firefighting due to intense environmental requirements by USFS
- Products are tested for fish toxicity, mammalian toxicity, & an entire comprehensive list of potential environmental effects. PHOS-CHEK® retardants meet USFS environmental specification to use on State and Federal lands
- USFS tests all Qualified Products for storm water runoff risks. If applied to USFS specifications, storm water runoff does not pose significant risk to aquatic animals
- https://www.fs.usda.gov/rm/fire/wfcs/qualified_products_long_term.php

United States Forest Service Qualification Testing

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

In addition to environmental testing, the United States Forest Service undertakes rigorous testing to determine that wildland firefighting chemicals meet performance requirements. Testing Includes:

- Mammalian and fish toxicity
- Initial and final corrosion (surface and intergranular)
- Viscosity stability/Product stability
- Pumpability – engines and other ground application equipment
- Abrasion
- Temperature cycling
- Microbial growth
- Color properties and visibility (opacity, fading, field visibility)
- Air drop characteristics
- Operational field evaluation
- Determination that potential wildland fire chemicals meet the performance requirements

PHOS-CHEK® retardants meet all USFS environmental and effectiveness requirements across all platforms and application methods, including aerial and ground applied retardants

Benefits of Using PHOS-CHEK Long-Term Retardants

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

- ✓ ***Improving the safety of firefighters and the public.***
- ✓ ***Protection of identified Safety Zone(s), Temporary Refuge Area(s) and escape route(s).***
- ✓ Can be applied 24/7 with no worries of inversions, weather conditions or night.
- ✓ Mixes easily to blend to be ready to apply.
- ✓ Can be applied with a variety of fire apparatus, water tenders and equipment.
- ✓ Can be applied days, weeks months in advance (Prevention/Protection).
- ✓ Easy to apply; Pinpoint accuracy of application from apparatus & hose lines.
- ✓ Once the product is applied it works wet or dry and remains effective until product is washed off.
- ✓ Can be used for critical infrastructure, utility assets, power lines, communications sites [Agency & Cellular], water supply, etc.
- ✓ Establishing and maintaining evacuation routes
- ✓ Apply prior to control and/ or prescribed fire projects

Benefits of Using PHOS-CHEK Long-Term Retardants

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

- ✓ Structure protection, within or outside the burn area thus reducing the number of resources assigned for structure and/or asset protection.
- ✓ Could reduce the quantity of apparatus assigned to improvements, structure protection by pretreating vegetation ahead of the fire.
- ✓ Establish anchor point(s).
- ✓ Firing out around structures and assets.
- ✓ Establish or reinforce control lines on active fires, prevent fire escape (wet line).
- ✓ Reduce fire intensity, check line.
- ✓ Used in conjunction prior to firing operation(s) by treating fuels (Once treated can conduct firing operations when conditions allow), reduce or eliminate ignition, limits spotting and fire intensity.
- ✓ Protection of Machinery and Equipment
- ✓ Pre-treating vegetation to reduce chances of ignition {welding, grinding, etc.]
- ✓ Environmental / air quality protection

Moving Forward

Wildfire Prevention Co. & Perimeter Solutions are resolute in our shared goals for Texas:

1. Getting State Agencies to adopt a paradigm shift from solely aerial application to include ground applied operations, switching from a reactive to a proactive approach.
2. Mitigating the risks around private companies and essential enterprises, such as utility companies and oil and gas producers.
3. Educating and protecting Texas citizens on their wildfire risk exposure.
4. Protecting critical infrastructure.
5. Egress hardening.
6. Maximizing Texas Fire Departments precious resources.

Ground Application Equipment

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

Applications Water Tender

Perimeter SOLUTIONS
Quality Products. Exceptional Response.

Team Page

Thaddeus Foster, Founder, Wildfire Prevention Co.

- President, JDLV Properties , *Present*
- President, Hyperion Partners Inc. (consultancy firm), *Present*
- COO & Operating Partner, Prometheus Restaurant Franchise Holdings, *November 2006 – December 2019*

Alex Foster, Chief Operating Officer, Wildfire Prevention Co.

- Real Estate Leasing and Acquisitions Director, Kering Americas, *2021 – Present*
- Real Estate Manager, H&M, *2019 –2021*
- Analyst/Associate, Deutsche Bank Corporate and Investment Banking division, *2014- 2018*

Jim Karels, Agency Liaison, Perimeter Solutions

- Retired National Fire Director for the National Association of State Foresters
- Retired Director of Florida Forest Service after 12 years
- Over 42 years of experience in wildland fire and forest management with the US Forest Service, Florida Forest Service, and International Association of Fire Chiefs
- Former President of NASF and currently serves on the board of both the Tall Timbers Conservancy and the Florida Forestry Association

Steve Barton, Prevention Protection Operations Manager, Perimeter Solutions

- Prevention Protection Operations Manager, Perimeter Solutions, *2008 to present*
- Previous Positions:
  - Airbase Shop Manager
  - Assistant Portable Operation Manager
  - Class A and B Foam R&D

Scott Holmquist, Technical Consultant

- Retired Assistant Deputy Director of Fire Protection Operations at CAL FIRE, with more than 40 years of experience ALL HAZARD response, incident management and training. He has held the position as a Type 1 Incident Commander and multiple other ICS positions, including Agency Administrator, Safety Officer, Liaison Officer and Operations Section Chief.
- Public Safety Specialist PG&E providing emergency response as the company representative with the agencies on incidents and working on planning, preparedness for events like Super Bowl 50 and PG&E's Public Safety Power Shutoffs.
- Presently provides consulting and training on fire safety, prevention, mitigation and the use of long-term fire retardants to various agencies and companies.

THANK YOU

Wildfire Prevention Corp. & Perimeter Solutions
Thanks YOU for
your time today!