



LESSONS LEARNED FROM WILDFIRE IMPACTS ON DISTRIBUTION SYSTEMS

APRIL 27TH, 2022

PNWS-AWWA CONFERENCE

AGENDA

- INTRODUCTIONS
- OUR STORIES
- LESSONS LEARNED

TIMELINE SINCE OREGON'S LABOR DAY FIRES



Sept. 8, 2020

Oregon's Labor Day Fires
1,000,000 acres burned



2021 and on

Recovery



2022

Spreading the Word



ALMEDA FIRE



FIRE ORIGIN

**VISUAL
INVESTIGATIONS**



A8 | Tuesday, September 8, 2020 | MailTribune.com | AshlandTidings.com

WEATHER / HEALTH

Five-day forecast for the Rogue Valley

Today	Wednesday	Thursday	Friday	Saturday
94° 54°	98° 55°	98° 57°	97° 56°	97° 56°
Partly sunny and very hot	Sunny and very hot	Very hot	Blazing sunshine and very hot	Very hot

Extended Forecast: Plenty of sun Sunday; very warm in the mountains. High 90. Mostly cloudy Monday; very warm in the mountains. High 84. Mostly sunny Tuesday. High 85. Sunny and very warm Wednesday and Thursday. High Wednesday 89. High Thursday 88 in the mountains to 92 in the valleys. Friday; mostly sunny; very warm in the mountains. High 85.

Temperature Trends

Actual and forecast (red bars), Normal (blue bars), Record (grey dots)

In the Region

Through 5 p.m. Monday

City	Mon. Hi/Lo/Prcp	Today Hi/Lo/W	Tom Hi/Li
Ashland	98/60/0.00	88/59/pc	93/61
Astoria	85/56/0.00	83/54/s	87/51
Bend	81/58/0.00	74/36/s	83/41
Brookings	90/65/0.00	92/62/s	78/51
Burns	86/38/0.00	71/29/s	78/31
Eugene	91/52/0.00	92/48/s	98/51
Florence	67/48/0.00	81/60/s	81/51
Grants Pass	100/55/0.00	98/56/s	98/51
Klamath Falls	94/46/0.00	76/40/s	82/31
La Grande	76/62/0.00	71/32/s	79/31
Lakeview	92/39/0.00	71/37/s	79/31

OUR STORIES

ALMEDA FIRE

Cities of Ashland, Talent,
Phoenix, Medford, Central Point

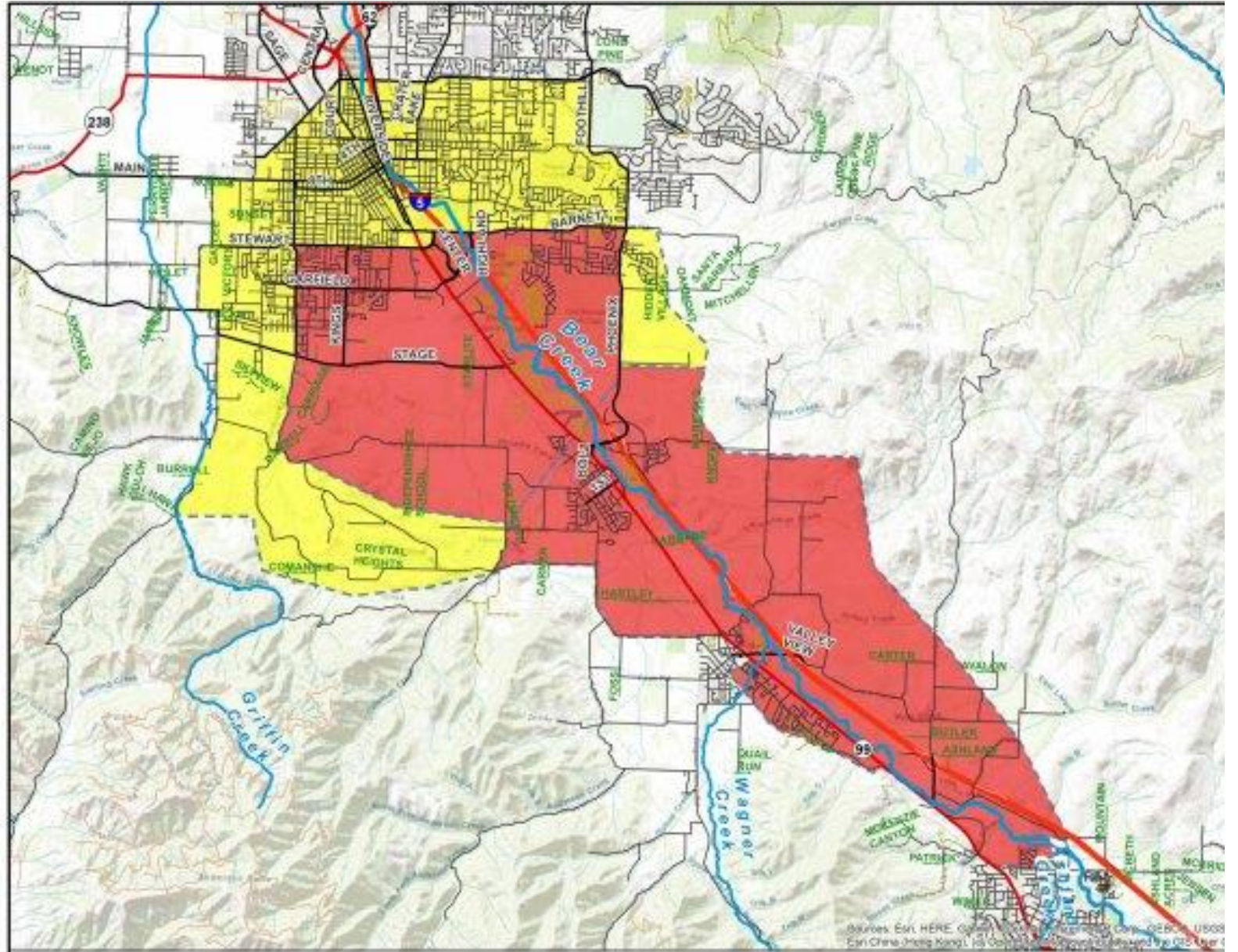
Oregon's most destructive
wildfire in recorded history

13 miles in an urban setting

45 MPH wind gusts

Killed 3 people

2,600 structures lost



Staff defended primary water supply until told it was too dangerous

Reservoirs Drained

Lost System Pressure

Destroyed Water Services also draining system

Lost Power for 2 weeks – Generator needed for repressurizing system

CITY OF TALENT

Public Works Building

City supply pump station survived due to staff efforts

Bear Creek

Pacific Hwy

Pacific Hwy

5

Bear Creek



Staff Dealing with Personal Issues

Reservoirs Drained

Lost System Pressure

Hydrants Running Dry

Destroyed Water Services draining
system

Supply Pump Station at Full Capacity

CITY OF PHOENIX

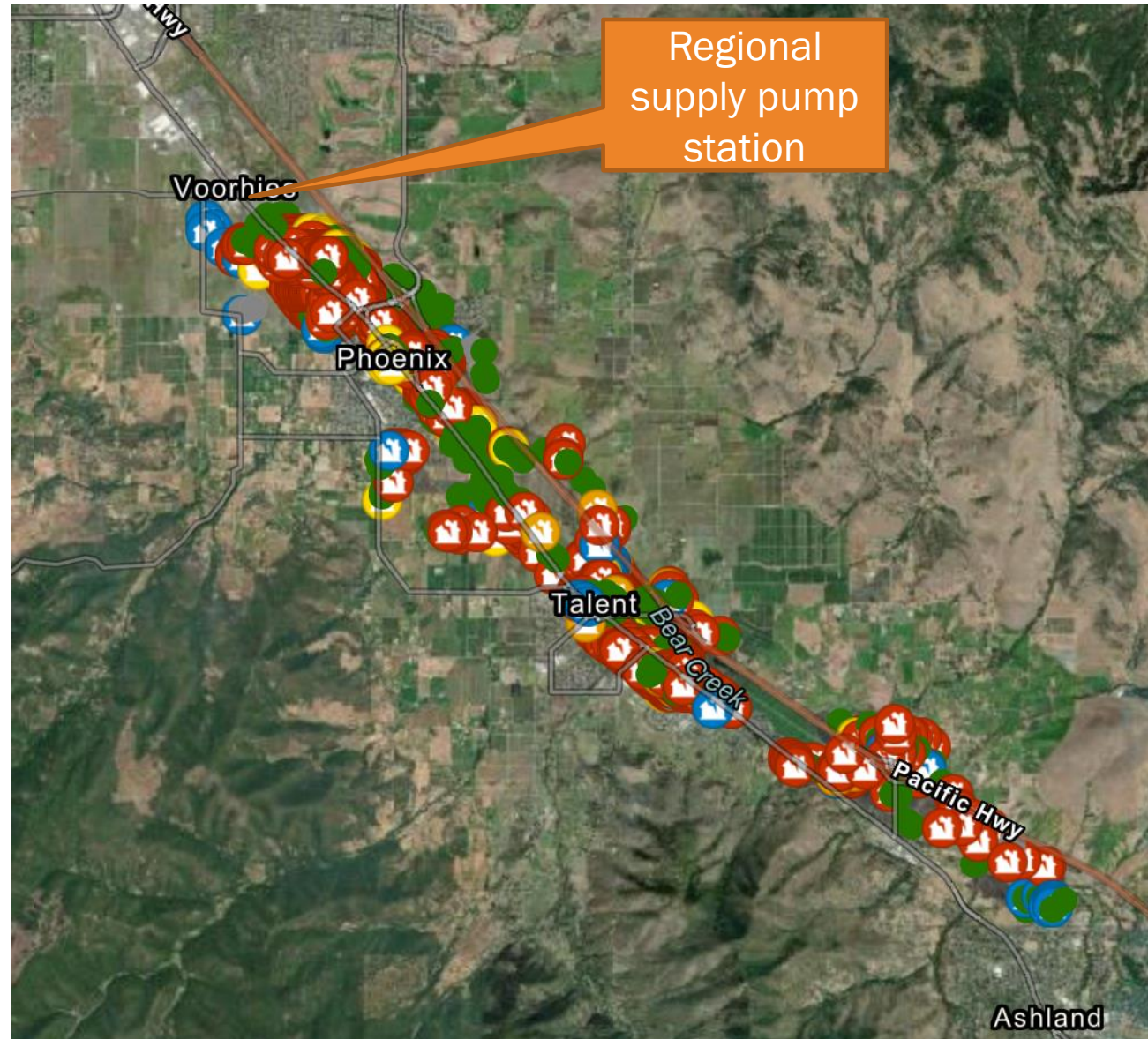
PHOENIX AND TALENT WATER SYSTEMS WERE LUCKY

Relatively low damage to water system

Valve isolation help from neighboring Cities

Able to restore water in a matter of days

Water quality monitoring



HOW DO YOUR RESIDENTS GET WATER AFTER A WILDFIRE?

Ashland Bike Brigade steps in to fill a gap

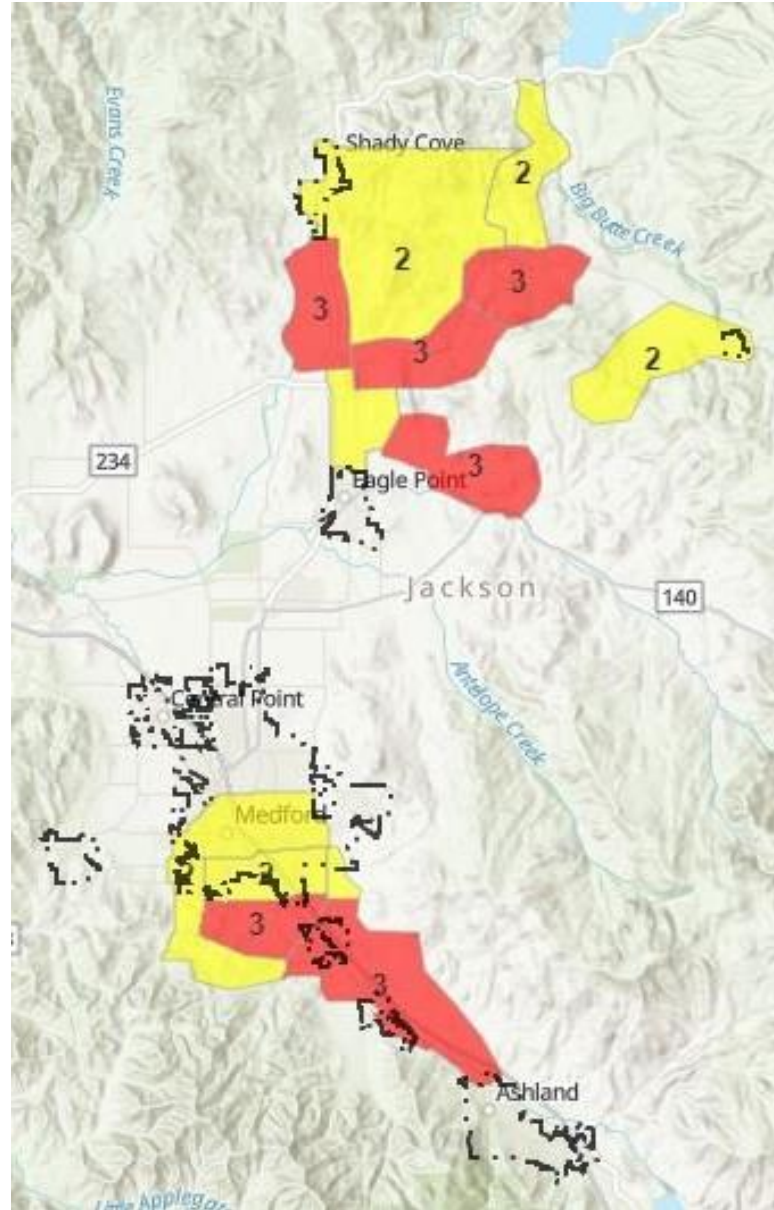
Who is ultimately responsible for supplying bottled or other emergency drinking water to the community?

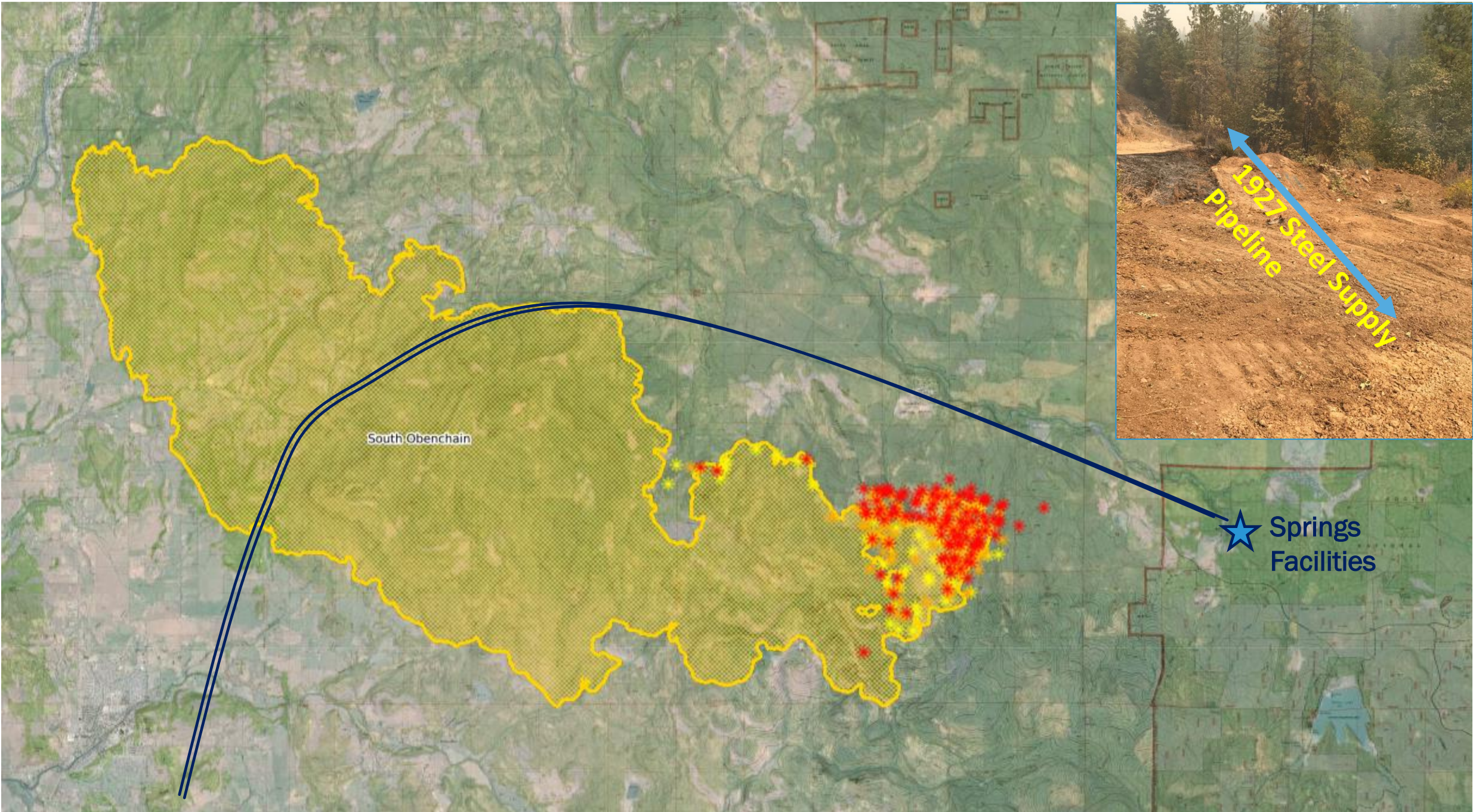


MEDFORD WATER COMMISSION

SUPPLIES TALENT AND PHOENIX

OBENCHAIN FIRE ALSO
OCCURRING AT SAME TIME –
IMPACTING BOTH SPRING AND
RIVER SUPPLIES



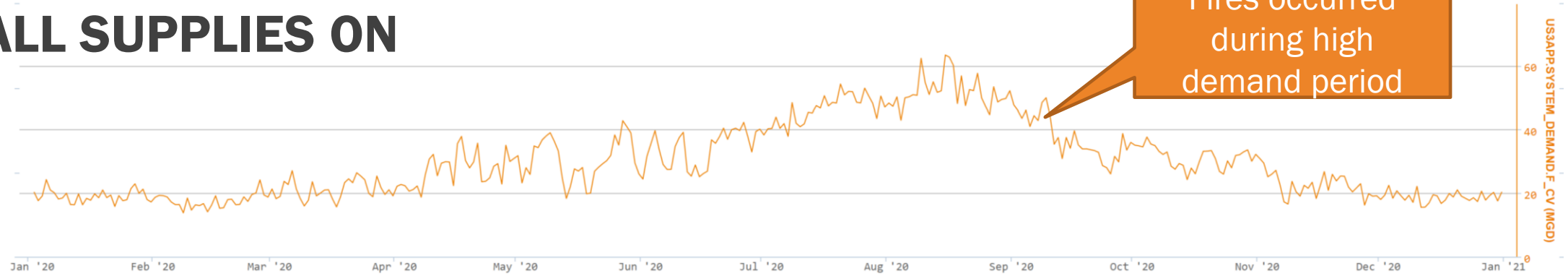


South Obenchain

★ Springs
Facilities

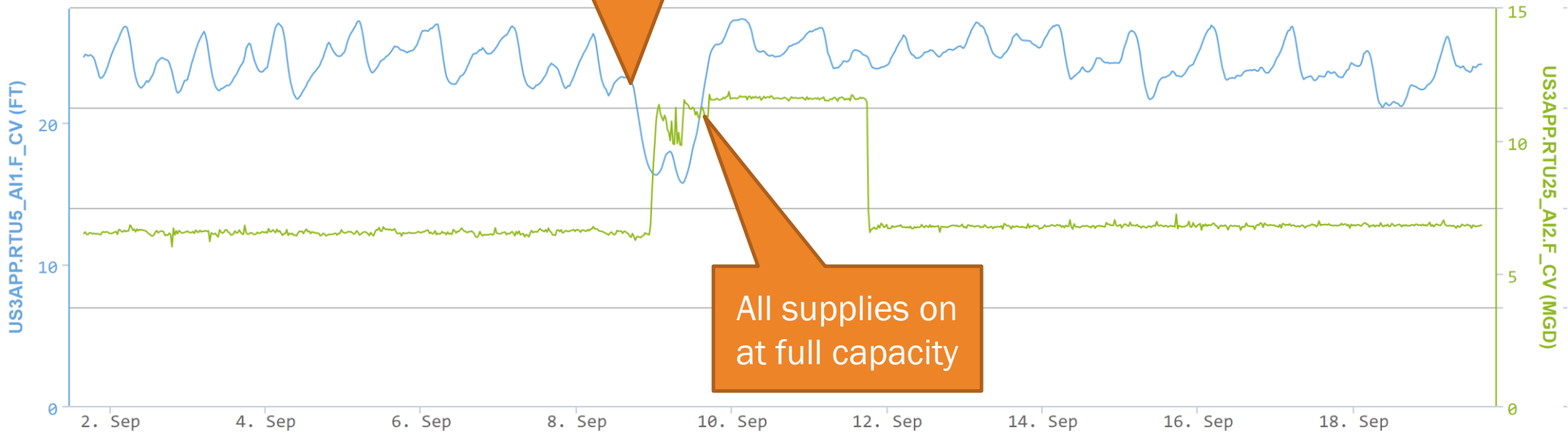
1927 Steel Supply
Pipeline

ALL SUPPLIES ON



Fires occurred during high demand period

Terminal Storage Reservoir Draining Quickly



All supplies on at full capacity

ALL HANDS ON DECK

MEDIA RELEASE

For Immediate Release

Date: September 8, 2020

Contact: Ken Johnson, Water Meter & Controls Supervisor/Acting Manager
Medford Water Commission
Office: (541) 774-2680 | Cell: (541) 660-9511
ken.johnson@medfordwater.org

NOTICE

Emergency Water Usage Restrict Due to Sustained High-Demand L

MEDFORD – With recent weather conditions and fire activity, water nearing the total system production capacity of both of Medford Water Butte Springs and the Rogue River. **To preserve water for fire domestic use, the Commission finds it necessary to immer**

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ken.johnson@medfordwater.org

NOTICE

Air in Water Due to Increased Pipeline Flow to Meet High Den

MEDFORD – To add to the supply and help keep up with increased demand necessary for public health and safety needs, the Commission has increased the flow from the Big Butte water source. Increasing the flow results in an excess of air in the pipelines, causing th



MEDIA RELEASE

For Immediate Release

Date: September 9, 2020

Contact: Ken Johnson, Meters & Controls Supervisor/Acting Manager
Medford Water Commission
Office: (541) 774-2680
Cell: (541) 660-9511
ken.johnson@medfordwater.org

NOTICE

Drinking Water Warning – Boil Water Advisory for Specific Area ONLY

MEDFORD – On the evening of Tuesday, September 8, 2020, the Charlotte Ann Pump Station stem pressure in pipelines south of the pump station, located at intersection of S. Stage Road and South Pacific Highway, due to fire activity. As a result of the loss of a distribution system, potentially harmful bacteria could be present in the



MEDIA RELEASE

For Immediate Release

Date: September 10, 2020

Contact: Brad Taylor, General Manager
Medford Water Commission
Office: (541) 774-2443 | Cell: (541) 255-5607
brad.taylor@medfordwater.org

NOTICE

Emergency Water Usage Restrictions Reduced to Volunt

MEDFORD – On Tuesday, September 8, Medford Water Commission customers were notified of the need to immediately restrict certain non-essential water uses to preserve water for emergencies and necessary domestic use due to fire activity and sustained high demand on the

Commission staff has assessed the current situation, and determined that due to stable water levels and increased flow from our Big Butte Springs source, the emergency water usage restrictions can be reduced to voluntary.



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Date: September 10, 2020

Contact: Brad Taylor, General Manager
Medford Water Commission
Office: (541) 774-2443 | Cell: (541) 255-5607
brad.taylor@medfordwater.org

NOTICE

Boil Water Advisory for S. Stage Road

MEDFORD – A limited number of specific Medford Water Commission customers in the S. Stage Road Water District area (south of S. Stage Road at S. Pacific Highway) were notified on Wednesday, September 9, 2020, of a loss of system pressure resulting from fire activity.

The advisory was a precaution for our customers to limit risk to health from potential bacteria.

The Commission has received sample results for those limited sections of the S. Stage Road Water Advisory, which show no bacteria present.

The Boil Water Advisory has been lifted for the impacted area and it is no longer necessary to boil water.

MEDIA RELEASE

For Immediate Release

Date: September 15, 2020

Contact: Brad Taylor, General Manager
Medford Water Commission
Office: (541) 774-2443 | Cell: (541) 255-5607
brad.taylor@medfordwater.org

NOTICE

Voluntary Water Usage Reductions No Longer Necessary

MEDFORD – On Tuesday, September 8th, Medford Water Commission customers were notified of the need to immediately restrict certain non-essential water uses to preserve water for emergencies and necessary domestic use due to fire activity and sustained high demand on the water system. By September 10th, these restrictions were reduced to voluntary, as reservoirs had reached stable levels and the flow had been increased from our Big Butte Springs source.



CITY OF CENTRAL POINT



- Water system babysitting
- Curtailment
- Resource Coordination w/ COM, County, PD, Fire, Expo
- Regular Parks and Public Works activities



CITY OF CENTRAL POINT



- Putting Out hot spots
- Monitoring hot spots
- Assisting PD with ensuring the Greenway was clear of people
- Road closures and traffic control with City of Medford and JC
- Assisting the Cities of Phoenix and Talent with leaks, sampling and flushing
- Grubbing and grading for base camp
- Providing resources to JC Expo shelter
- Regular daily activities



CITY
OF CENTRAL
POINT



Mr. Clayton,

I wanted to write to you and commend the actions of the Central Point Public Works Department during the course of this disaster. I live at (*redacted*) which was directly in the path of the Greenway Fire.

I have never seen a Public Works Department work so hard and creatively utilize their resources as I did with your employees over the last few days. The response was impressive to a level that I cannot describe, and it truly quelled any unease that I had about the safety of my home.

A resounding thank you is well deserved for your Public Works Crews. They clearly went above and beyond and Central Point is a better place for their dedication.



RAINBOW WATER DISTRICT

Eugene-Springfield Metro Area

ORS 264 Special District

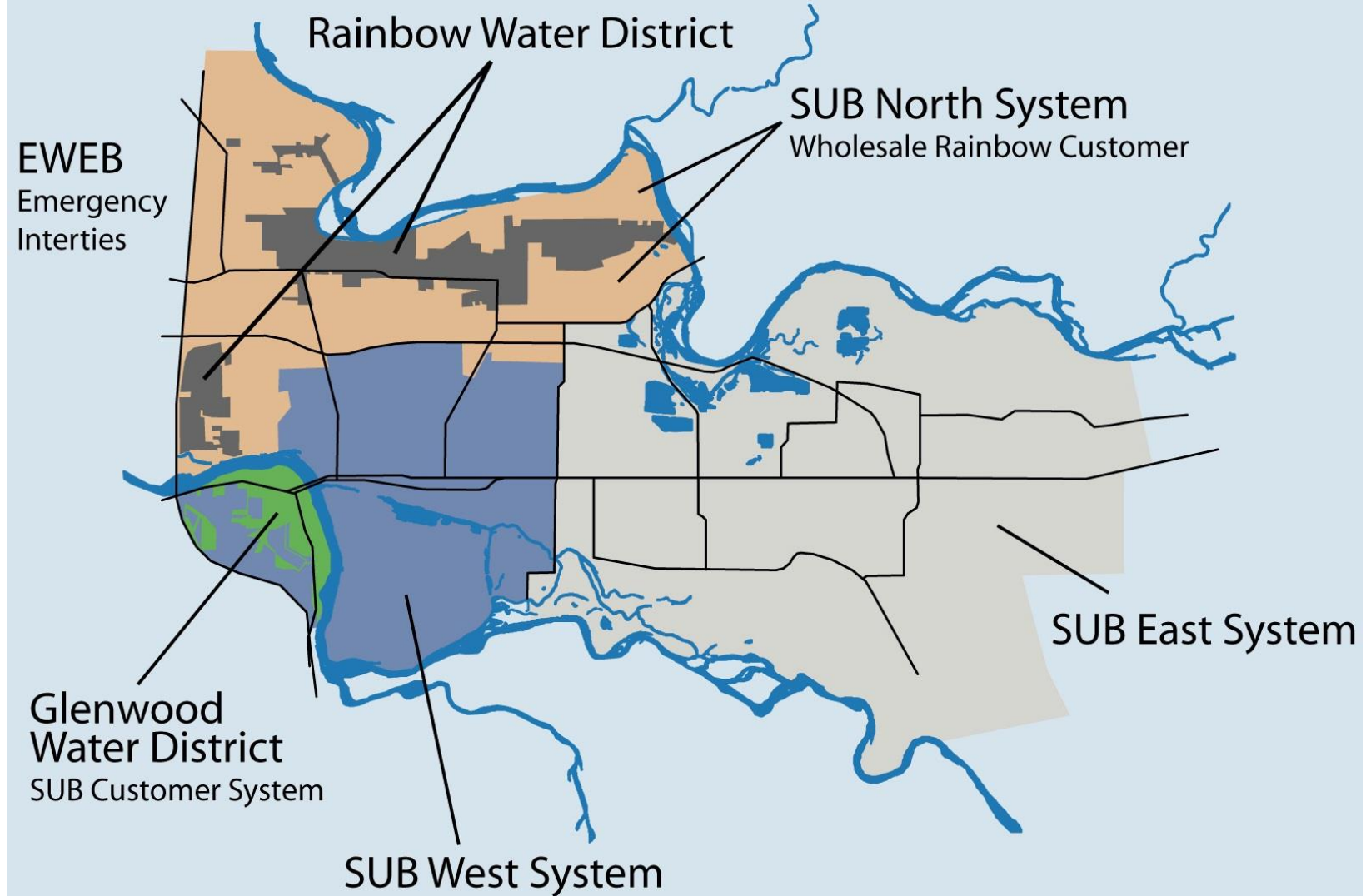
Groundwater Utility

Formed in 1949

2,400 Retail Connections

Wholesale Provider to SUB for
Springfield (City) Customers

Less Private Development =
More Small Systems Consulting



RAINBOW WATER DISTRICT

Maximum Staff of 7 Since 1992

Superintendent

Assistant Superintendent

Office Manager and
Utility Billing Clerk

Three Water Operators
(Treatment and Distribution)

Assistant Superintendent was
Semi-Retired Part-Time from
Home in September 2020



RAINBOW WATER DISTRICT

Contract Services Outside of
Springfield Since 1994

- Marcola Water District
- Shangri-La Water District
- Deerhorn Community Water Association
- Shenandoah Homeowners
- Blue River Water District



Marcola Water District since 1994 (IGA)

Shangri-La Water District since 2015 (IGA)

Deerhorn Community Water Association since 2015 (Contract)

Shenandoah Homeowners Inc since 2019 (Contract)

Blue River Water District since 2020 (IGA)

Services provided range from planning and engineering, operations and maintenance, DRC services, billing and bookkeeping. (State law allows ORS 264 districts to support non-profit private systems.)

BLUE RIVER WATER DISTRICT

Intergovernmental Agreement
RWD-BRWD signed January
2020

Work To Include Assessment and
Evaluation of Accounting/Admin,
Operations, and Capital Assets

Assessment Delayed by COVID

Rainbow Staff Toured Blue River
August 13, 2020 and Borrowed
Files for System Assessment



Progression

Holiday Farm
ORWIF-200430
FINAL

173,094 acres at 09/21/2020 1440 hrs



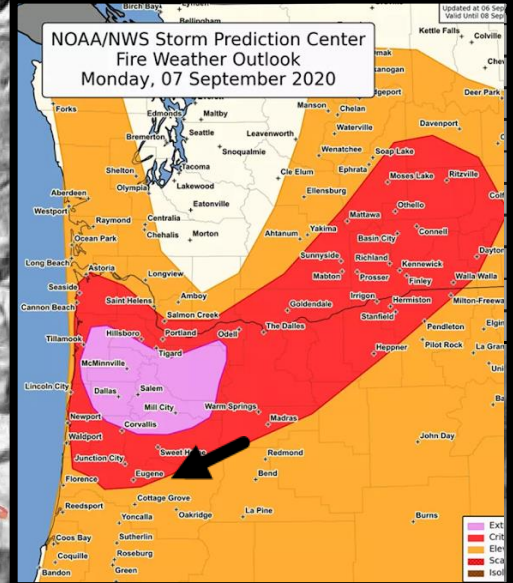
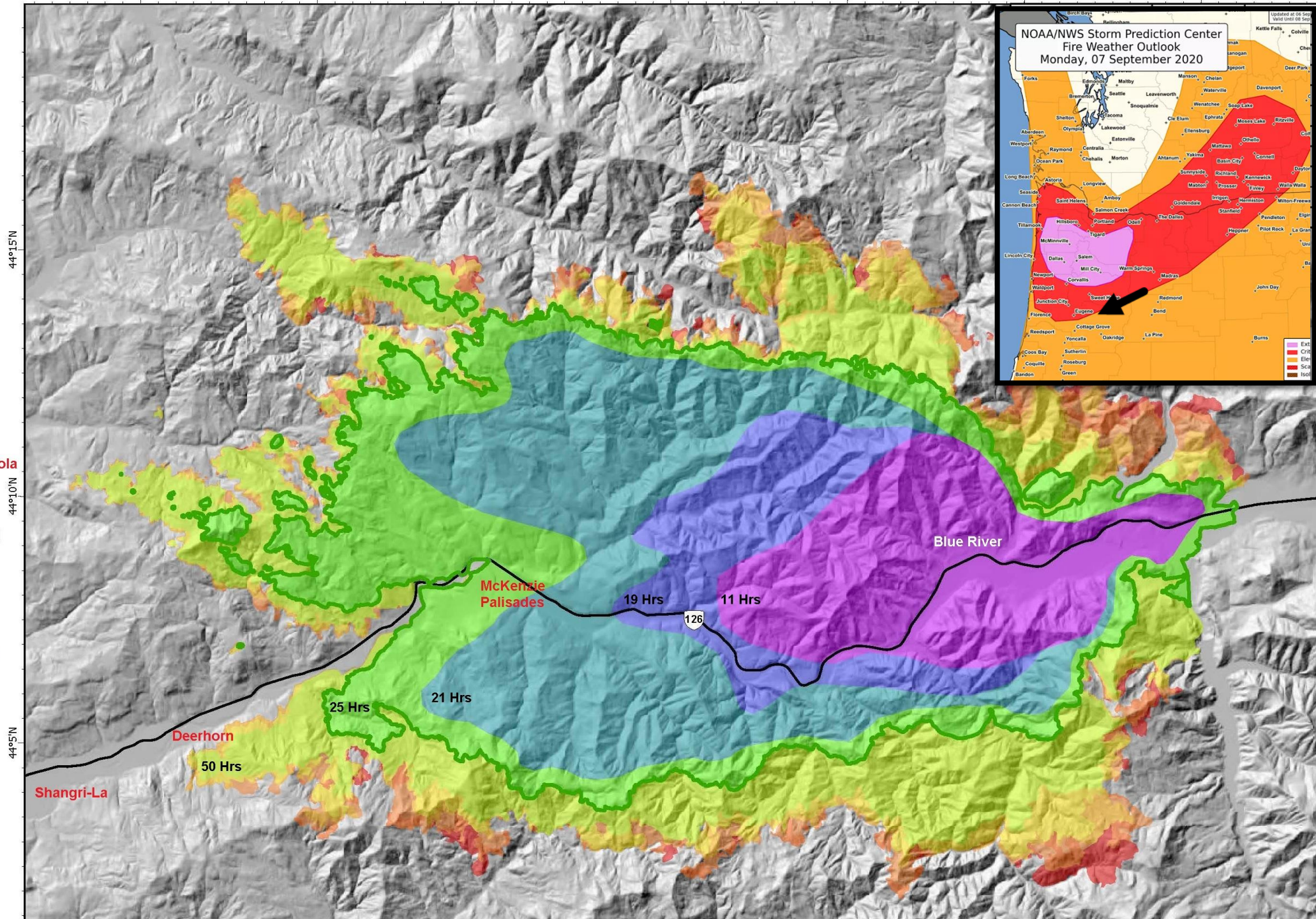
ODF IMT 3
09/26/2020 2011
Acres from IR and GPS
North American 1983 Datum.
LatLong Grid

Shenandoah

EUGENE

SPRINGFIELD

*Fire perimeters are estimates only
based on MODIS data, and are not
official acres



HOLIDAY FARM FIRE

Communities of McKenzie
River Valley, Blue River, Rainbow

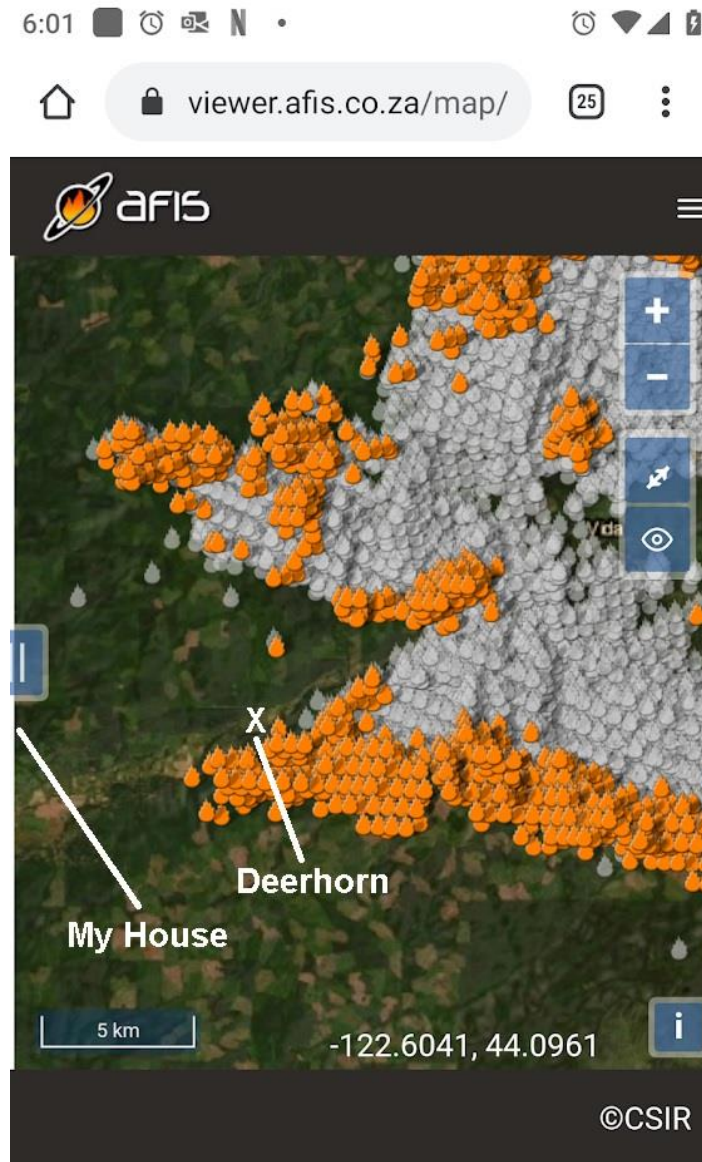
Fire Size: 173,393 Acres

576 livestock + pets sheltered

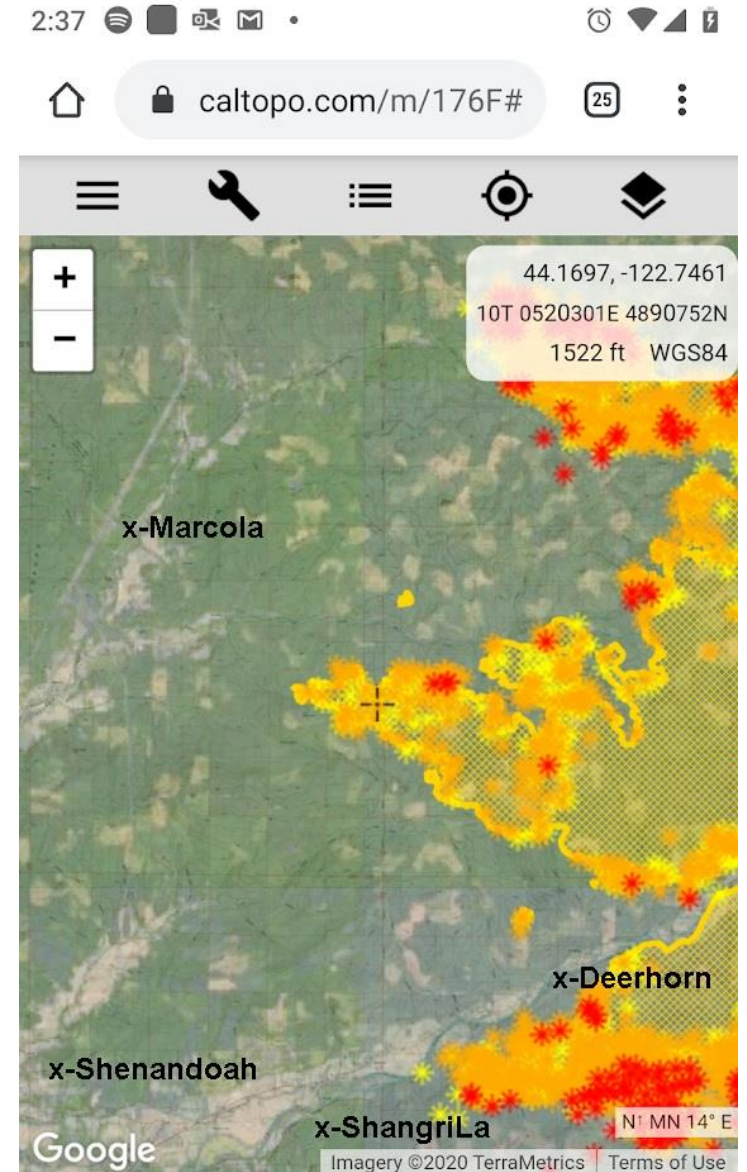
5,000 people evacuated, 1
death

\$162 million in property damage

547 dwellings lost
(over 1,100 structures)



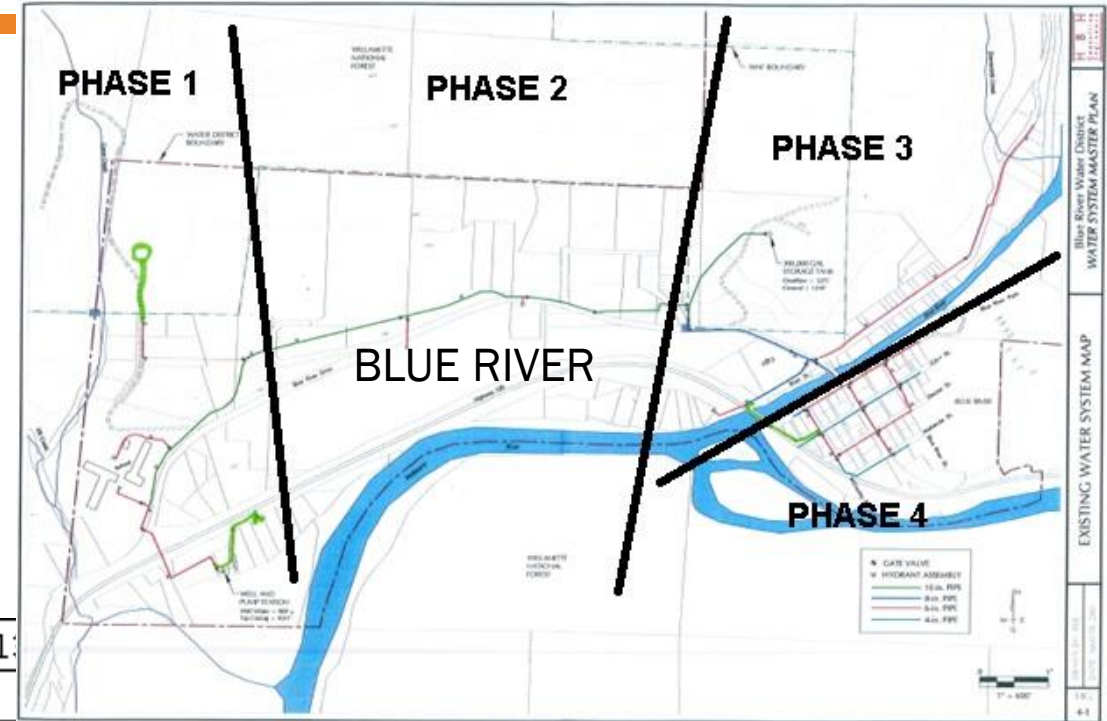
6 am on Sept. 10, starting Day 3.



2:37 AM on Sept. 11

HOLIDAY FARM FIRE

Simultaneous Boil Water Notices
Blue River Initial Damage Assess
and Recovery Strategy



BOIL WATER NOTICE	09/07	09/08	09/09	09/10	09/11	09/12	09/13	09/14	09/15	09/16	09/17	09/18	09/19	09/20	09/21	09/22	09/23	09/24	09/25	09/26	09/27
Rainbow	Not impacted																				
McKenzie Palisades								X	X	X	X	X	X	X	X	X	X	X	X	X	...
Blue River								X	X	X	X	X	X	X	X	X	X	X	X	X	...
Marcola			X	X	X	X	X	X													
Shenandoah				X	X	X	X	X													
Deerhorn					X	X	X	X	X	X	X	X	X								
Shangri-La					X	X	X	X													

Notes:
EWEB loaned us Lonny Sayles. We helped check his system (M-P) and he helped us check Blue River.
McKenzie Palisades had a Boil Notice 9/13-10/1 and a Do Not Drink (VOCs) 10/1-11/5.
Blue River had a Boil Notice 9/14-10/1 and a Do Not Drink (VOCs) 10/1-10/26.

BLUE RIVER DAMAGE

Loss of Phone and Internet

Limited Fuel Availability

No Electrical Power

No Public Water System



BLUE RIVER DAMAGE

Loss of Electric Service to the
District's Wellfield Site

Loss of Well 1 Building and
Motor (Vertical Turbine Pump)

Loss of Well 2 Building and
Motor (Vertical Turbine Pump)

Loss of Backup Generator

Loss of District's Paper Records



HOLIDAY FARM FIRE

BEFORE (top picture)

Well 2, Well 1, Generator
(left-to-right)

AFTER (bottom picture)

Well 1 (foreground)

Well 2 (background)



HOLIDAY FARM FIRE

Blue River Well 1 had a tree land on the motor so we worried about mechanical damage.

We prioritized replacing the motor and restore Well 2 to service, running on a generator.

39 days on generator power.



HOLIDAY FARM FIRE

Shangri-La (left) has a transfer switch and connections to run both wells, but no generator.

Shenandoah had neither so we created a temporary connection.



HOLIDAY FARM FIRE

MARCOLA

Maple Wellfield (3 wells)

Irish Well

Portable Generator



**SEPTEMBER 2020 –
SET UP FOR
FIRESTORMS**

RIVERSIDE FIRE

The background of the slide is a photograph of a wildfire. The sky is filled with intense orange and red flames. In the foreground, a utility pole stands on the left side, and the dark silhouettes of trees are visible against the bright fire.

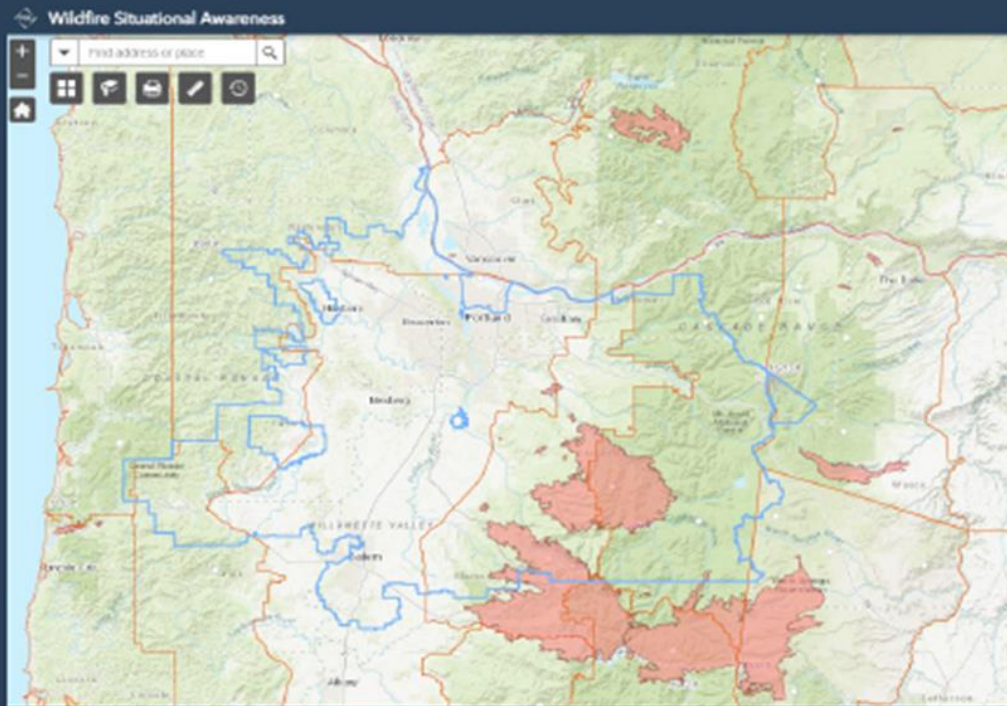
Red Flag Warning –

A Red Flag Warning is issued for weather events which may result in extreme fire behavior that will occur within 24 hours.

The type of weather patterns that can cause a watch or warning include low relative humidity, strong winds, dry fuels, the possibility of dry lightning strikes, or any combination of the above.

RIVERSIDE FIRE

Labor Day 2020 – Wildfire and Wind Events



RIVERSIDE FIRE

Record heat, severe drought, extremely dry fuels and dry, gusty winds caused:

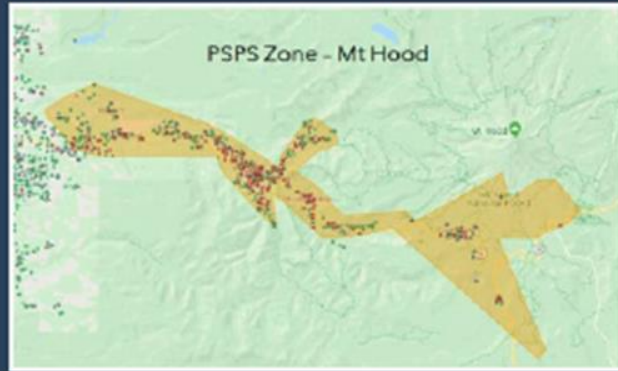
- Three historically significant wildfires within PGE's service territory
- PGE Public Safety Power Shutoff (PSPS) implementation
- Similar in strength & duration to a Diablo/Santa Ana event

Statewide statistics

- 1.14 million acres burned
- Double the 10-year average of 557k acres
- 3000+ structures destroyed
- 11 fatalities

PSPS Initiation and Storm Response

Initiated 1st PSPS Zone in Mt. Hood



Community Resource Center

- Number of Customer Assisted: 2,600+
- 1,250+ gallons of water distributed
- 2,800+ bags of ice distributed
- Number of Employees Working at Center: 89



Restoration Totals

- Customers Restored - 241,045 (several customers being restored more than once)

Damages to PGE System

- Oak Grove 115 kV Line (Faraday-Oak Grove & McLoughlin-Oak Grove lines)
- Bethel Round Butte 230 kV Line

Equipment Replaced

- Crossarms - 178
- Poles - 259
- Conductor - 16 miles
- Transformers - 252

Customer Service:

- Calls Answered by IVA/IVR 192,232
- Calls Answered by Advisors 21,777

Safety Focus:

- Few minor injuries, vehicle and property damage
- No new COVID-19 cases



RIVERSIDE FIRE

PORTLAND WATER BUREAU





RIVERSIDE FIRE

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RIVERSIDE FIRE

PORTLAND WATER BUREAU



RIVERSIDE FIRE

FOLLOW UP PROJECTS (UNDER FEMA REVIEW)

Portland Water Bureau

Mt Hood Resiliency Project Details

- Rebuild four substations: Boring, Sandy, Brightwood, Welches
- Underground two 57 kV lines
- Dunns-Corner/Brightwood 57 kV and part of Brightwood/Rhododendron 57 kV .
- Approximately 21 miles total today

Dunns-Corner-Portland Hydro Project

- Underground 13 & 57 kV lines, approximately 12 miles today
- Undergrounding existing overhead distribution underbuilt on the 57 kV line routes
- PGE will be performing preliminary engineering to determine the best route for undergrounding these lines

Underground Distribution Lines to Create a Welches Resiliency Zone

- Serves critical facilities: Urgent Care, Water Treatment Plant, Pumping Station, Fire Station, Ranger Station
- Serves community gathering areas: Thriftway, Elementary and Middle Schools

RIVERSIDE FIRE

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Dunns-Corner-Portland Hydro Project

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EXTRA SLIDES



HOLIDAY FARM FIRE

LESSONS LEARNED

Equip wells with manual transfer switches and the ability to connect backup power.

Provide access for a portable generator and fuel storage.



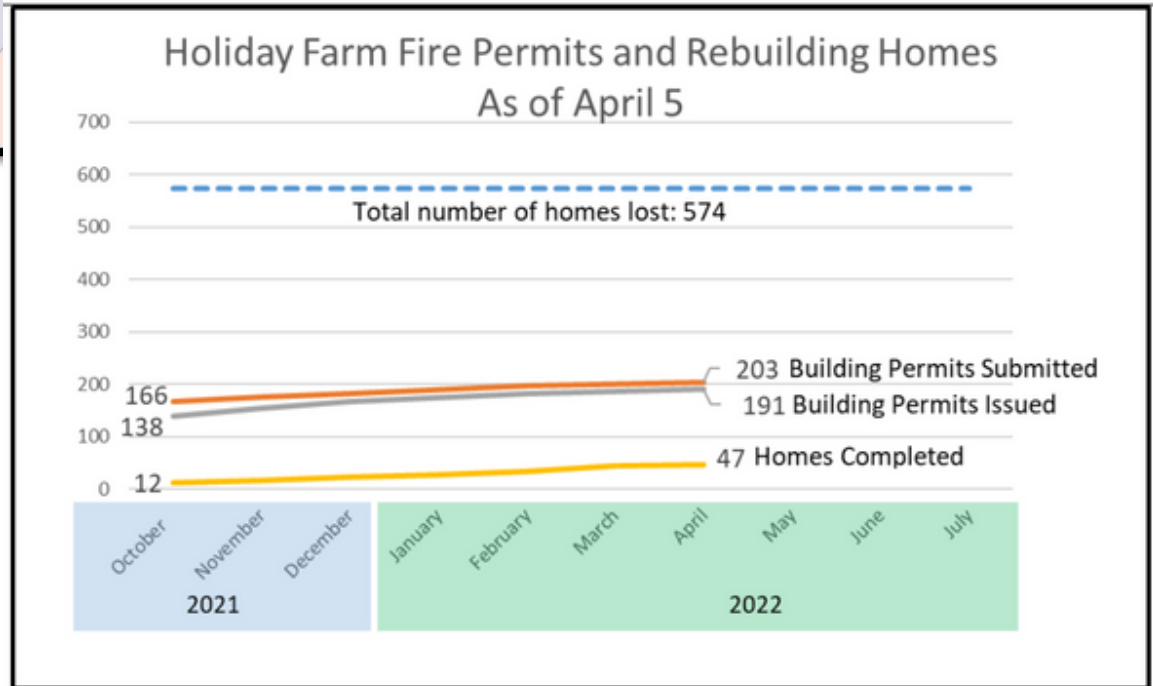
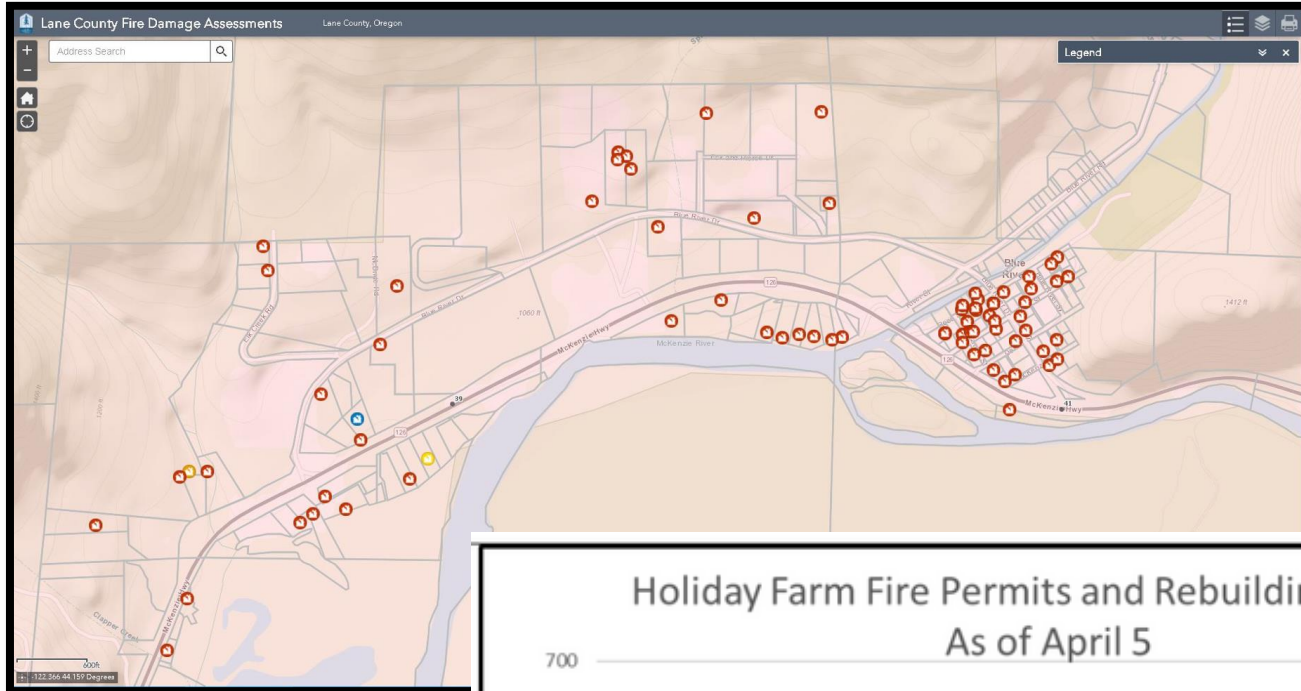
HOLIDAY FARM FIRE

LESSONS LEARNED

Recovery Slowly Continues.

574 dwellings were lost.

As of April 5, 47 homes built.



MWC Employees Response to the Fires

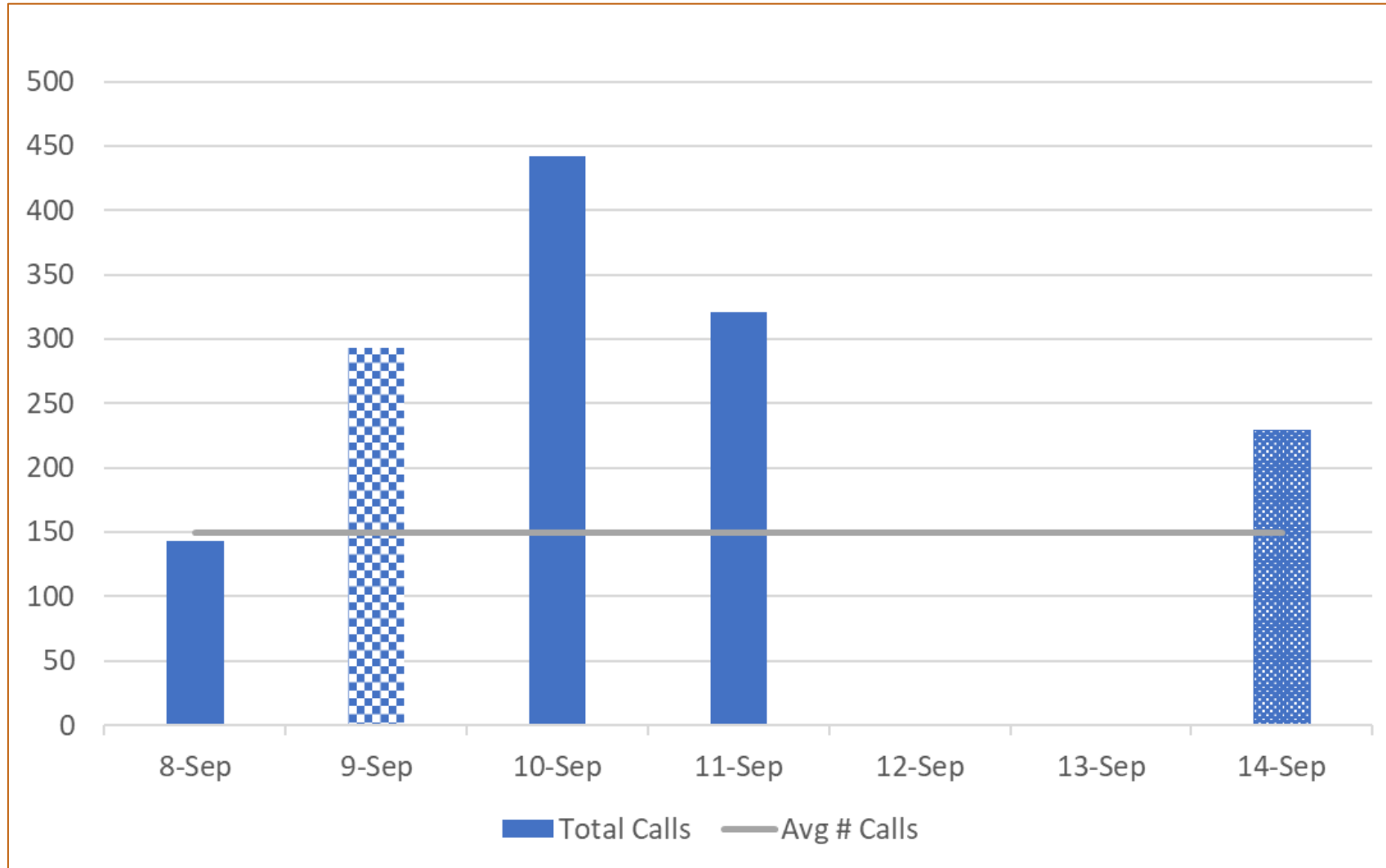
TEAMWORK

Community
Supporting Others
Dedication

Late Hours
Pitching In

Getting the Job Done
Going Above and Beyond

An increase in customer call volume was observed





PREPAREDNESS, WHEN PROPERLY PURSUED, IS A WAY OF LIFE, NOT A SUDDEN, SPECTACULAR PROGRAM.

- SPENCER W. KIMBALL

WILDFIRE IMPACTS ON WATER SYSTEMS – LESSONS LEARNED

The following are lessons learned from the Oregon Labor Day fires of 2020 from panelists at the 2022 PNWS-AWWA Conference.

Staffing

- € Encourage staff to have emergency and evacuation plans established for themselves and their families in case staff are needed for extended hours.
- € Provide options for staff that are in evacuation zones. Consider cots to sleep at the office and maintaining emergency supplies of food and water for extended shifts.
- € Establish policies and plan for emergency response when telecommuting, working from home due to COVID, or other reasons ahead of time.
- € Have staff cell phone numbers readily available.
- € Think about dividing into shifts early on, even for small teams. Adrenaline gets everybody moving at first, but as the disaster drags on, fatigue can lead to mistakes and injury.
- € Consider how to develop systems for formal and informal mutual aid for staffing resources in advance. Maintain good relationships with nearby water systems. Invite operators of nearby systems to joint training sessions, allowing some system familiarity in the event water systems need to rely on help from outside operators.

Operations

- € Initiate Incident Command asap
 - Operations:
 - Liaison Officer: Set up communication channels with other agencies
 - Finance: Set up bill project number for reimbursement, track resources used for FEMA reimbursement with as much detail as possible
 - Logistics: Delivering food and water to staff, sleeping arrangements
 - Safety Officer: Your staff may be doing jobs they aren't prepared for. Know when to call it quits for personal safety.
- € Expect to maximize supply and pumping at full capacity to maintain pressure as long as possible.

- ⊘ Expect to coordinate with fire department regarding different pressure zones or water district boundaries so they know where the pressurized water is.
- ⊘ Storage facilities are not sized for wildfire in urban settings. Be prepared for them to drain, but try to keep as full as possible.
 - Consider partnering with the local fire agency to install additional dedicated storage for use by water tenders.
- ⊘ When damaged by fire, customer water services will likely leak and if significant enough, can contribute to losing system pressure & draining tanks. Plan to isolate areas of the system after fire fighting efforts are complete in order to restore system pressure.
- ⊘ Back-up power needs to be ready for emergencies. Permanent generators need to be exercised and the fuel kept fresh. For portable generators, ensure all of the correct lugs and cables are available for connecting to the needed equipment. Train staff and practice making connections in advance. JP
- ⊘ Purchase and stage other emergency systems, such as sprinkler systems – requires periodic practice runs and O&M
- ⊘ Develop a business continuity plan. Ensure digital copies of important records are available and saved in the cloud and off-site, and accessible from multiple locations. JP
- ⊘ Perform a post-event assessment of facilities. Trainings are available to perform and document assessments. Mobile platforms available too from FEMA (Android and Apple app is – [Survey123](#))
 - <https://www.fema.gov/disaster/how-declared/preliminary-damage-assessments>
 - Have employees take FEMA ATC-20 – designed for post-seismic event assessments but can work for post-catastrophic fire events as well

Public Notice

- ⊘ Have curtailment plans with well-defined levels and messaging ahead of the fire season.
 - Make sure curtailment and boil water notices are ready to go.
 - Have phone numbers for large water users readily available to request curtailment
- ⊘ Use clear, consistent, regular messaging for regional water providers
- ⊘ Use social media to spread accurate messages and counter erroneous information.
- ⊘ Use all possible forms of media available: City/utility website; social media; (even door hangers or signs on portable barricades at the entrance to neighborhoods for rural systems. JP)
 - Have dedicated staff ready to respond to social media

- € Have phone numbers at media outlets ready

Water Quality

- € Post-Wildfire VOC Sampling – Needed at every reconnected service. May be easier to do in-house than to hire out due to quality control. Can be costly – can be reimbursed by FEMA.
 - <https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/PREPAREDNESS/Documents/post-wildfire-VOC-sampling-guidance.pdf>
- € Surface water supplies downstream of wildfires may be impacted with turbidity and pollutants.
- € Consider the possibility of ash impacting surface water quality and even entering reservoir vents. Have a plan to monitor for impacts and to deal with the ash.
- € Burned neighborhoods have no more demand and water can go stagnant in pipes. Can install auto-flushers at hydrants to keep water cycling until the area is rebuilt.

Communications

- € Plan ahead and have emergency contact info up to date for local and state emergency needs.
- € Participate in local emergency planning groups, to build rapport with individuals at different agencies who can provide support and help spread the word in a crisis. JP
- € Staff relied heavily on group text messaging for internal management group, contacting board of directors, and external agencies.
- € Rural systems struggled with the loss of communication systems. Cell towers and repeater stations, if not damaged, still ran out of fuel when an area was inaccessible for multiple days. (Not just fire, winter weather can do this too.) Consider increasing fuel storage. Develop backup systems including truck-mounted radios and satellite phones. JP
- € Build and maintain relationships with fire, police, and other relevant stakeholders ahead of emergencies.
 - Don't overlook volunteer groups – NETs and other community based orgs.

State Agencies/Compliance Issues

- € Designate individuals to provide situation reports to the EOC and public health regulators. In Oregon larger systems report directly to the state, but some small systems report to the county's public health department. Both were seeking updates on boil water advisories, and written reports could be sent to multiple agencies while also documenting events. JP
- € Boil Water Advisories – how is communications with OHA/DWS happening?
- € See above – how does a utility get back into compliance?

Supply Chain Issues

- € Right-sized backup generators are not always available, or generators providing the correct voltage.
- € Establish relationships with multiple vendors (on Blue Sky days).
- € Maintain contact with area Circuit Riders. Develop relationships with fellow AWWA members to know who could share parts and tools in a pinch. JP

Recovery

- € No cell phone coverage (or 911 call capabilities) for months after the Holiday Farm Fire. Water providers may not have access to cellular-based SCADA monitoring and may need to consider more labor-intensive options for sampling and monitoring. JP
- € Review contracting policies. Ensure you have the ability to procure emergency equipment if your governing body has evacuated and there is no quorum to make decisions. JP
- € Consider how to operate from generators for a longer period of time in the event that fire damages the electric system and parts and contractors may be delayed. JP
- € Establish level of service goals to determine return-to-normal operations

Prevention

- € Vegetation thinning around facilities
 - Central Point was able to use police seizure funds to pay for brush clearing equipment
- € Fire-safe critical facilities
- € Seek and implement post-fire mitigation grants
- € Seek out pre-disaster funding mechanisms to prepare for the next event
 - Building Resilient Infrastructure & Communities / FEMA grant program

Thanks to the following for preparing this list:

Chris Wanner – Portland Water Bureau
Jamie Porter – Rainbow Water District
Mike McLenathan – City of Central Point
Rachel Lanigan – Medford Water Commission