

# Successful Wildfire Ozone Exceptional Events Demonstrations in Washoe County

**Julie Hunter, Senior Air Quality Specialist**

Washoe County Health District, Air Quality Management Division

National Cohesive Wildland Fire Management Strategy Workshop

March 28, 2018

# Exceptional Events Demonstration Requirements

- Narrative Conceptual Model
  - Regional Description
  - Non-Event Ozone Formation
  - Exceptional Event Summary
- Clear Causal Relationship
  - Tiered Analysis
- Natural Event
- Not Reasonably Controllable or Preventable
- Conclusions and Recommendations



**Guidance on the Preparation of Exceptional Events Demonstrations  
for Wildfire Events that May Influence Ozone Concentrations**

**Final**

**September 2016**

U.S. Environmental Protection Agency  
Office of Air Quality Planning and Standards  
Air Quality Policy Division  
Geographic Strategies Group  
Research Triangle Park, North Carolina

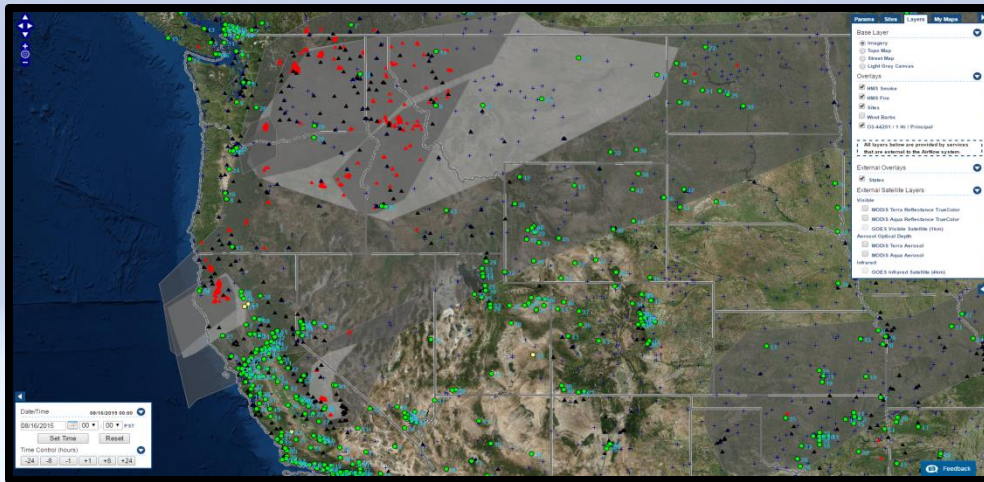
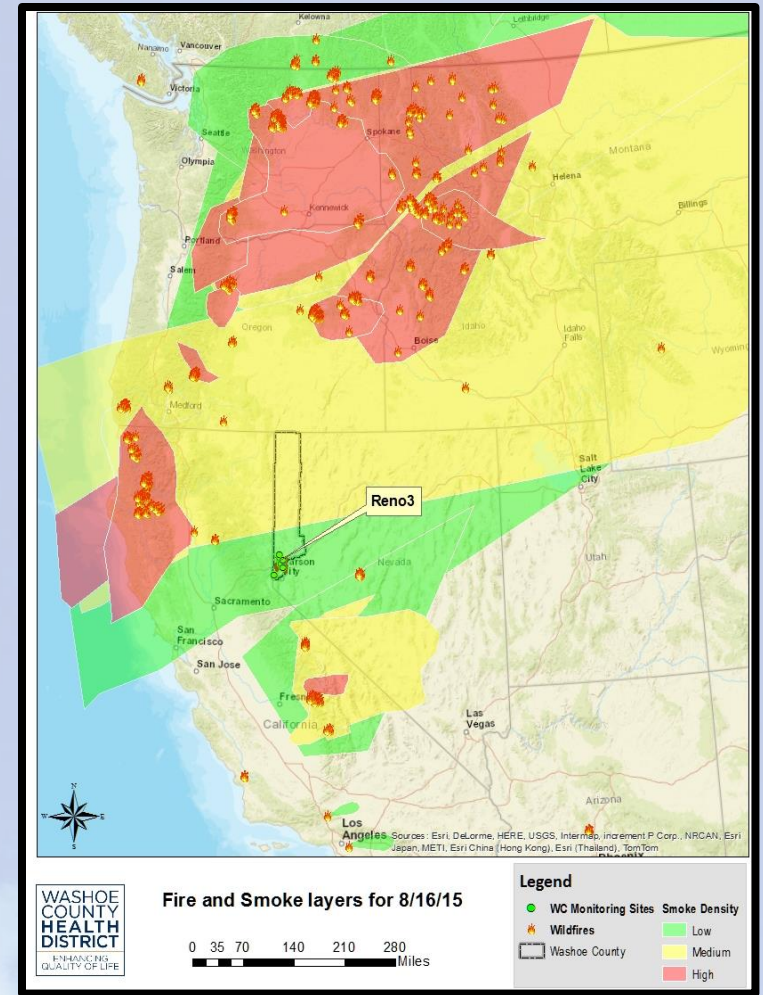
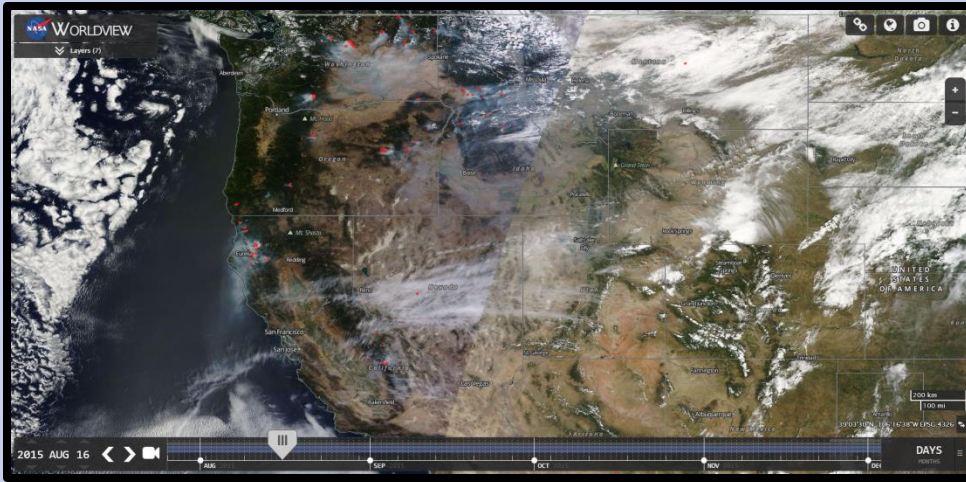
# EE Requirements: Translated

- Provide Proof
  - Was There a Fire
  - Was Smoke Transported to Reno
  - Did the Smoke Impact Monitors
  - Was There an Exceedance of the Standard

# Was There a Fire & Smoke Transported to Reno

- Visible Satellite Imagery
- HMS Smoke Plumes
- Detected Fires
- NWS and NOAA Products
- Media Coverage

# Visible Satellite Imagery



# Text Products and Media Coverage

Area Forecast Discussion  
National Weather Service Reno NV  
135 PM PDT MON JUL 4 2016

.SYNOPSIS...

Dry and breezy conditions will prevail for the upcoming week. Smoke and haze from the Trailhead fire will move across much of the region each afternoon and evening through the week. A slow cooling trend continues with daytime temperatures near average starting Tuesday.

&&

.SHORT TERM...

3/21/2017 Smoke Text Product - Satellite Services Division

Sunday, July 3, 2016

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY THROUGH 0100Z July 4, 2016

**SMOKE:**  
Northwestern to South Central Canada/Great Lakes Region:  
An extensive area of light density remnant smoke from fires in the Northwest Territories, northern Saskatchewan, northern Alberta, and northern Manitoba extends southeastward from northwest Nunavut to southern Ontario and the northern Great Lakes. Moderately dense to dense smoke is especially prevalent over the Northwest Territories directly north of the bulk of the fire activity. Numerous wildfires were seen in between cloud cover emitting light to heavy density smoke to the north in northern Saskatchewan and southeast of Great Slave Lake in the Northwest Territories. Wildfires in northern Manitoba were producing light to moderate density smoke to the west.

**California/Nevada:**  
Areas of thin to moderately dense remnant smoke were seen over parts of northern and southern California, and Nevada. This smoke is largely from the Trailhead fire in California, the fire named Pine in Ventura County California and the Hot Pot fire in northern Nevada. The Pine fire was fanning light to moderate density to the southwest and northwest while the Trailhead fire in the Sierra foothills continues to emit a light to moderate density smoke plume to the northeast into western Nevada. The Hot Pot brush fire in west-central Elko county Nevada was seen spreading quickly to the east-northeast in shortwave IR imagery. A light to heavy density smoke plume was emanating to the east-northeast from this brush fire although clouds obscured the full extent of this smoke to the east.

## Areas of Smoke to Continue

**Hourly AQI (Combined PM and O<sub>3</sub>)**  
Saturday, August 22, 2015 11:00 AM PDT

Temperature: 81 F RH: 18% Wind: East at 11 MPH

Camera Feed:  
<http://www.wrh.noaa.gov/rev/webcam.php>

AirNow.gov Hourly AQI <http://www.wrh.noaa.gov/rev/webcam.php>

- Smoke from numerous wildfires will continue to affect the region
  - Sensitive groups need to monitor air quality
- Monitoring Stations: <http://smoke.airfire.org/monitoring/#/>

USFS Tahoe NF and 1 other Retweeted  
NWS Reno @NWSReno - 29 Jun 2016  
Some potential for #TrailheadFire smoke to affect Tahoe, Truckee, Reno later today. Depends on fire activity.

### Haze/Smoke Possible Later Today

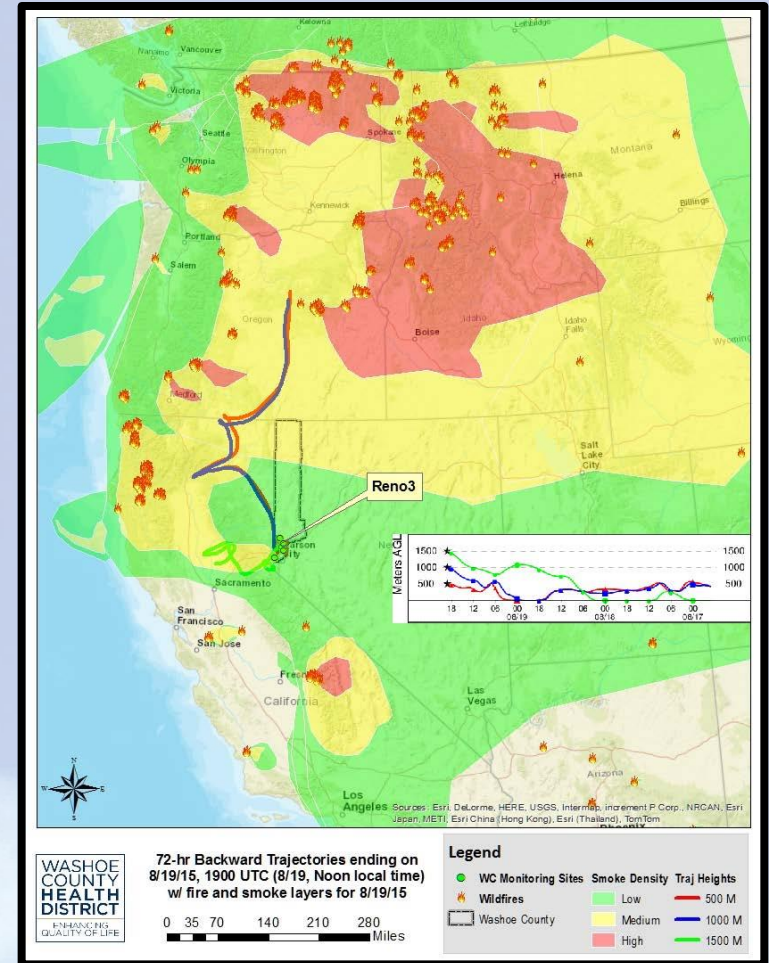
NOAA HYSPLIT Simulation

- If the Trailhead fire near Foresthill, CA remains active today – light to perhaps moderate smoke, haze possible this afternoon east of the Sierra crest.
- Areas north of Truckee, I-80 most likely to be impacted; possibly near Reno. Low confidence in air quality, visibility impacts due to uncertain fire behavior.
- Smoke would be carried east of the Sierra crest by the zephyr westerly breeze, mainly after 2 PM.

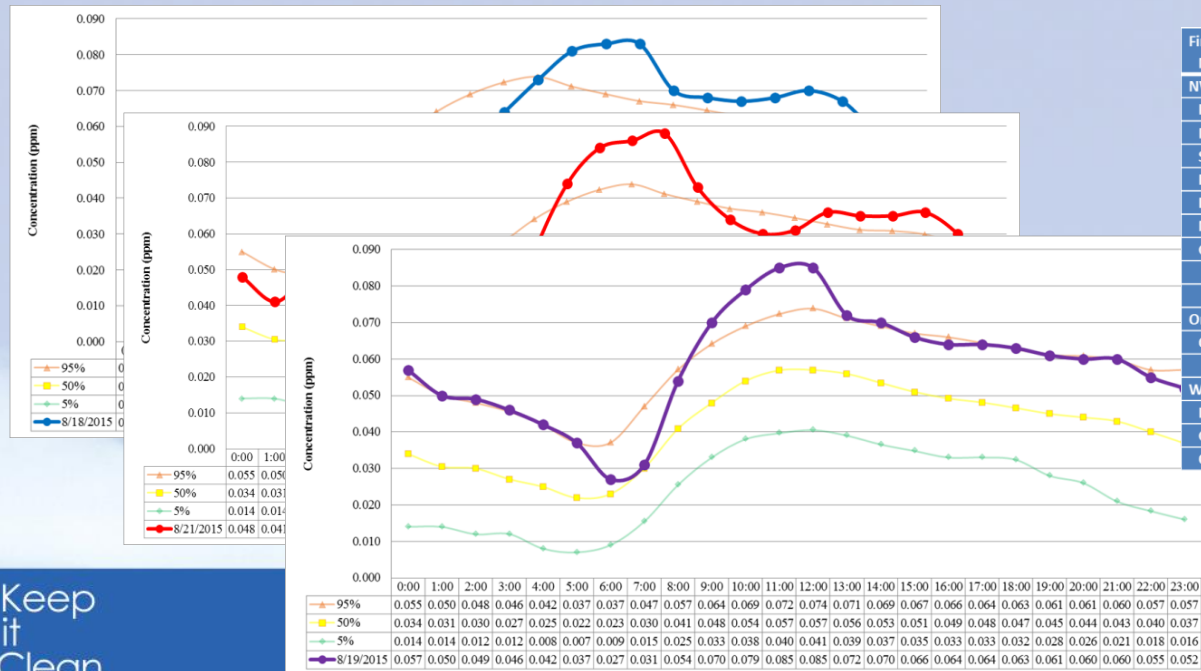
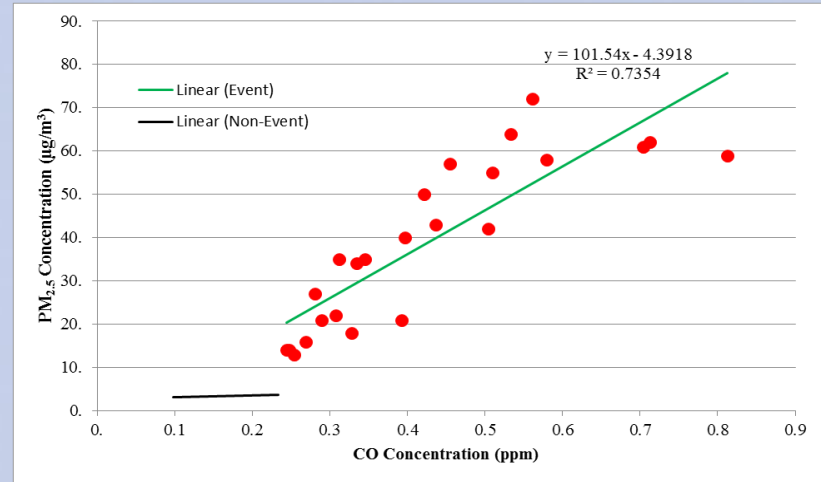
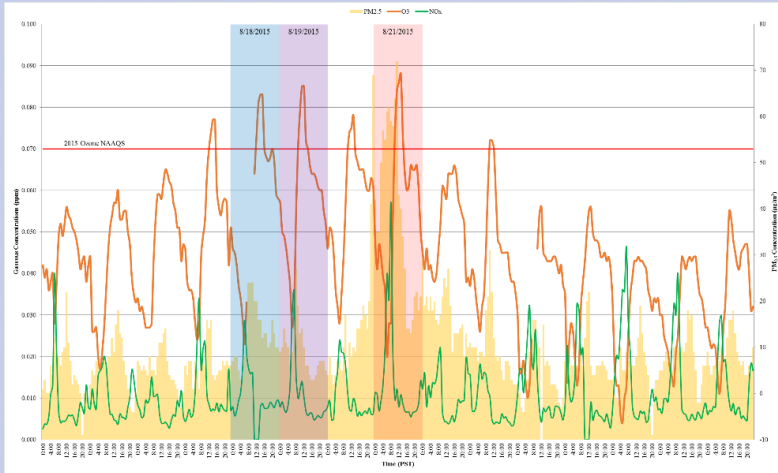
Reno National Weather Service  
Forecasting for the Sierra and western Nevada since 1905

# Did Smoke Impact Monitors

- HYSPLIT Trajectories
- Q/D Analysis
- Historical Concentration Comparison
- Pollutant Comparisons
- Correlation Analysis
- Additional Weight of Evidence



# Tier 3 EE Analysis = Very Complex



Fire Location/ Name	Lat/Long	Distance (km)	Acres Burned	Emissions (tons)	Q/D (tpd/km)
<b>NW California/</b>					
Fork Complex	40.45/-123.128	301	188	119	<1
Mad River Complex	40.34/-123.383	317	1,106	2,011	6
South Complex	40.62/-123.448	332	810	514	2
Route Complex	40.64/-123.586	345	193	351	1
River Complex	40.91/-123.437	345	2,415	2,106	6
Nickowitz	41.47/-123.750	396	952	851	2
Gasquet Complex	41.85/-123.969	436	1,864	1,667	4
<b>Total</b>			<b>7,528</b>	<b>7,673</b>	
<b>Oregon/</b>					
Canyon Creek	44.28/-118.96	561	7,755	5,618	10
<b>Washington/</b>					
Kettle	48.76/-118.461	1,066	1,842	1,335	1
Grizzly Bear	46.11/-117.679	814	36,000	65,296	80
Okanogan	48.519/-119.662	1,038	0	0	0



# 2015 and 2016 Exceptional Events

- 2015 Wildfire EE
  - November 2016
  - Addendum March 2017
- 2016 Wildfire EE
  - April 2017
- Under New Exceptional Events Rule (2016)
- ***Concurred Upon May 2017***
  - ***First Wildfire Ozone Submitted, Reviewed and Concurred by EPA***

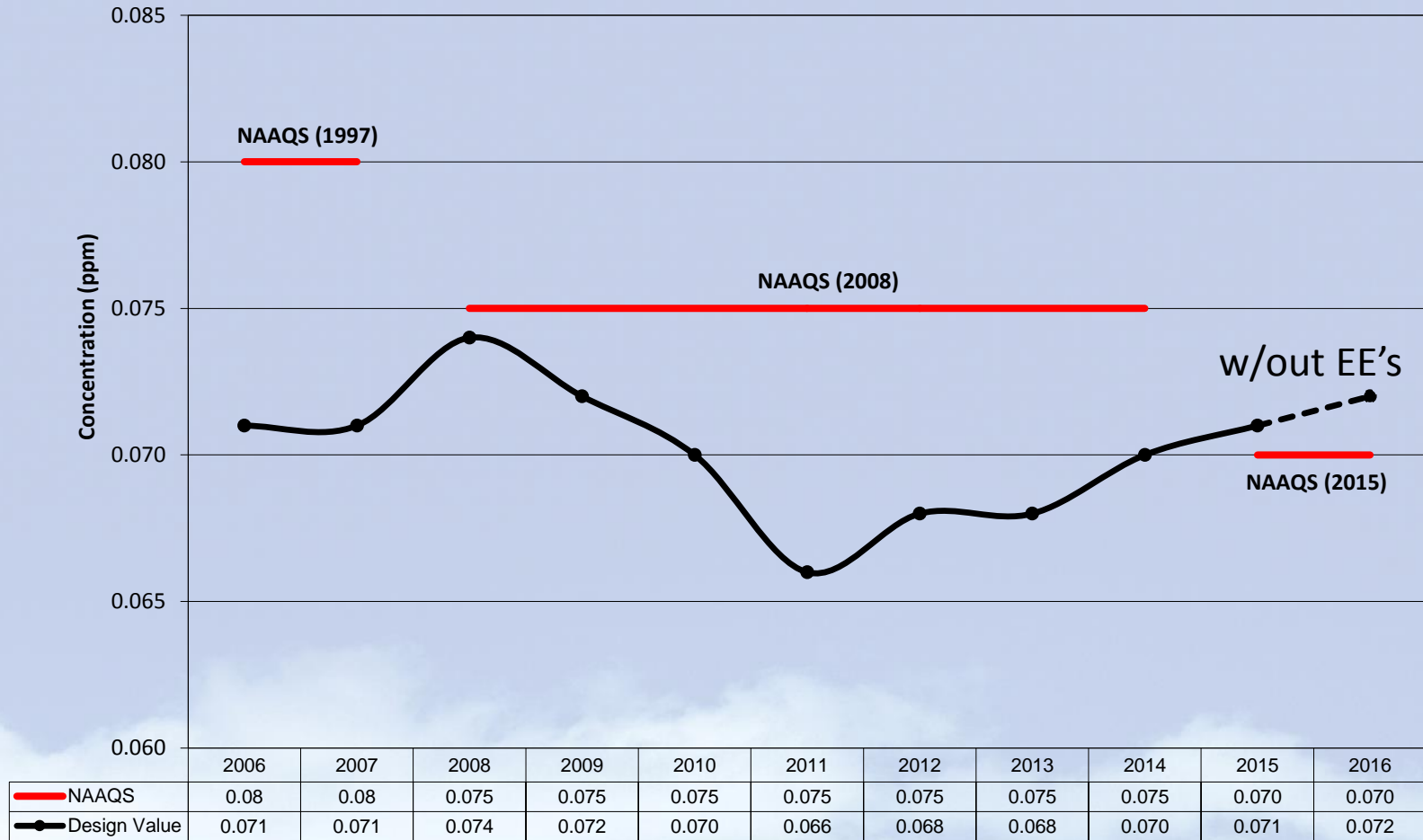
Exceptional Events Demonstration for  
2015 Ozone Exceedance in  
Washoe County from the  
2015 California Wildfires  
August 21, 2015

Submitted to U.S. EPA Region IX November 10, 2016

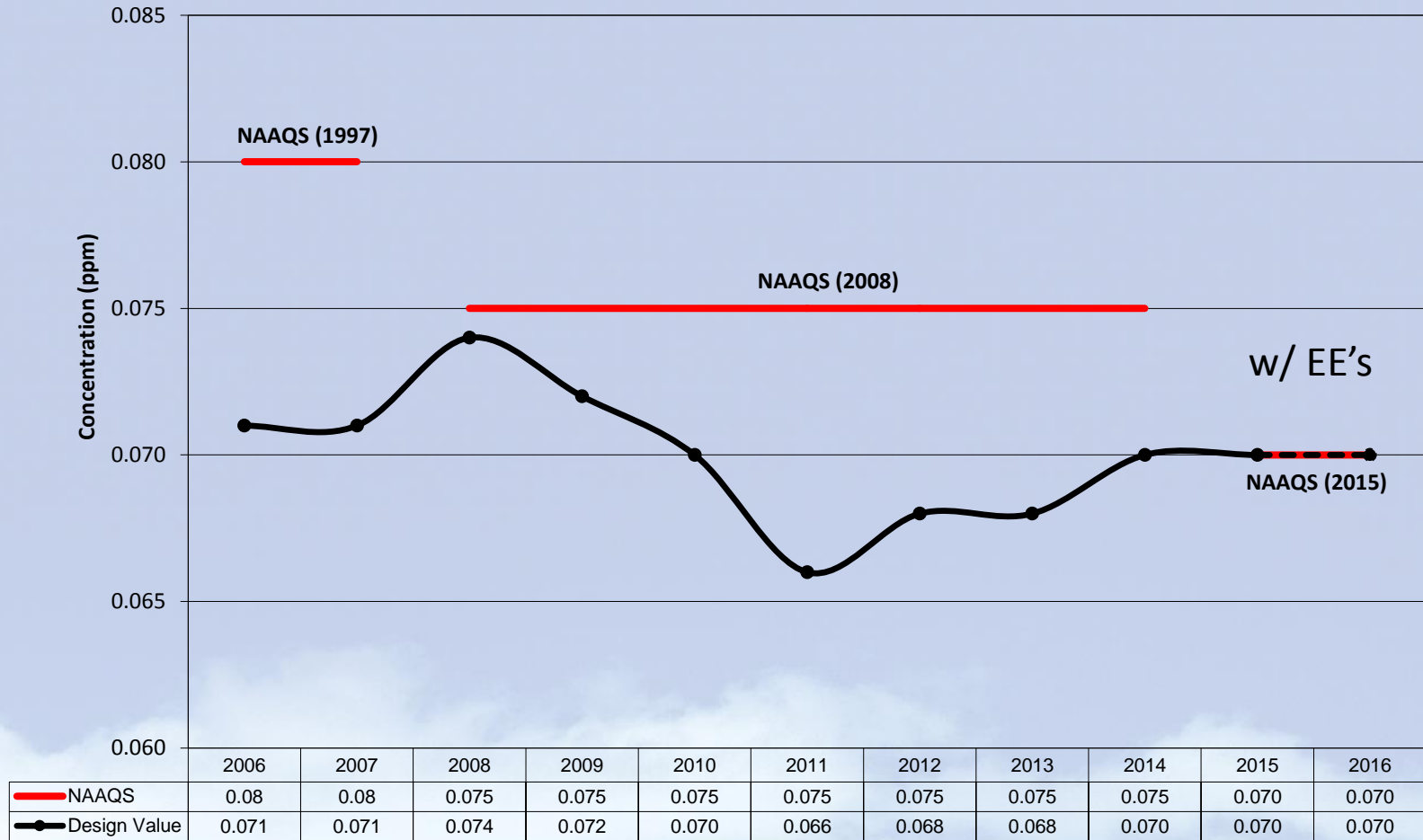
Exceptional Events Demonstration for Ozone Exceedances  
in Washoe County, Nevada from the Trailhead Fire  
on July 2 through July 4, 2016

Submitted to U.S. EPA Region 9 on April 14, 2017

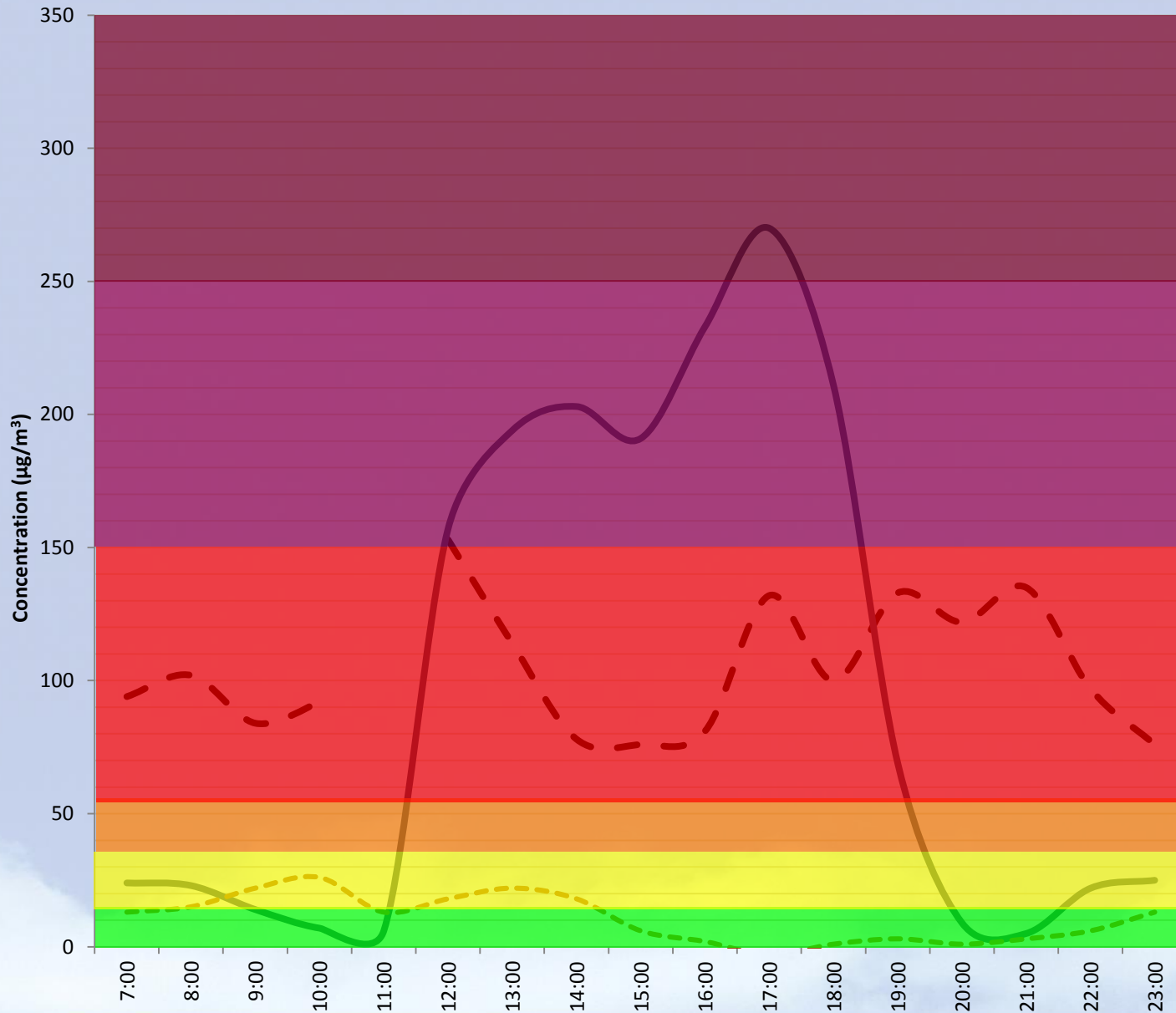
# 8-hr Ozone Trends vs. NAAQS



# 8-hr Ozone Trends vs. NAAQS



# Hourly PM<sub>2.5</sub> Concentrations Comparing Rx Fire and Wildfire



- Rim Fire (8/23/2013)
- King Fire (9/18/2014)
- - - Rx Fire (11/6/2014)

Air Quality Index	Who Needs to Be Concerned?	What Should I Do?
Good (0-50)	No one. Air quality is good for everyone.	It's a great day to be active outside!
Moderate (51-100)	Some people may be <b>unusually sensitive to particulate pollution</b> and may need to take some actions.	<b>Unusually sensitive people:</b> Consider reducing prolonged or heavy exertion. Watch for symptoms, such as coughing or shortness of breath. These are signs to take a little easier. <b>Everyone else:</b> It's a good day to be active outside!
Unhealthy for Sensitive Groups (101-150)	Sensitive groups include <b>people with heart or lung disease, older adults, children and teenagers.</b>	<b>Sensitive groups:</b> Reduce prolonged or heavy exertion. It's OK to be active outdoors, but plan short breaks and do less intense activities. Watch for symptoms such as coughing or shortness of breath. <b>People with asthma:</b> should follow their asthma action plans and keep quick relief medicine handy. <b>If you have heart disease:</b> Symptoms such as chest pain, dizziness or lightheadedness, or unusual fatigue may indicate a serious problem. If you have any of these, contact your health care provider.
Unhealthy (151-200)	Everyone can be affected.	<b>Sensitive groups:</b> Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling. <b>Everyone else:</b> Reduce prolonged or heavy exertion. Take more breaks during all outdoor activities.
Very Unhealthy (201-300)	Everyone.	<b>Sensitive groups:</b> Avoid all physical activity outdoors. Move activities indoors or reschedule to a time when air quality is better. <b>Everyone else:</b> Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling to a time when air quality is better.
Hazardous (301-500)	Everyone.	<b>Everyone:</b> Avoid all physical activity outdoors. <b>Sensitive groups:</b> Remain indoors and keep activity levels low. Follow up by keeping particulate levels low indoors.

# Questions and Comments



Julie Hunter, Senior Air Quality Specialist

Washoe County Health District, Air Quality Management Division

[jdhunter@washoecounty.us](mailto:jdhunter@washoecounty.us)

Exceptional Events Demonstrations

[OurCleanAir.com](http://OurCleanAir.com)