

NAPA WATER SYSTEM EARTHQUAKE RESPONSE

- Like Fine Wine, The Right Blend Of Self-help And Mutual Aid

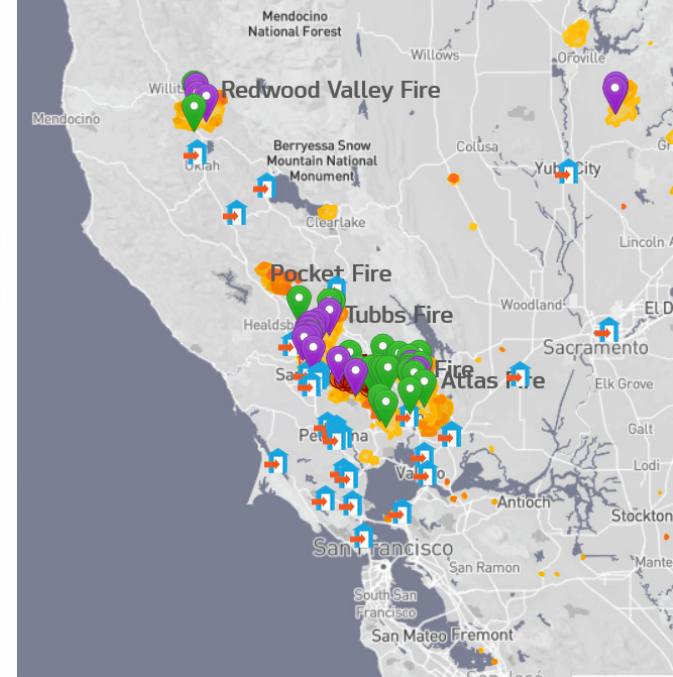
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Water General
Manager
City of Napa

Charles Scawthorn, S.E.





Northern California 2017 wildfires



Here you can see how the fires grew and where they're spreading. This map will be updated as information becomes available.

[🔗 Complete coverage](#) [🔗 Photos from the fires](#)

🔴 Current hot spot 🔵 Evacuation center
🏠 Evacuated hospital 📍 Death 🍷 Damaged winery

🔗 Click on the icons and explore the buttons below for more information.

How the fires spread:

Day 1

Day 2

Day 3

Day 4

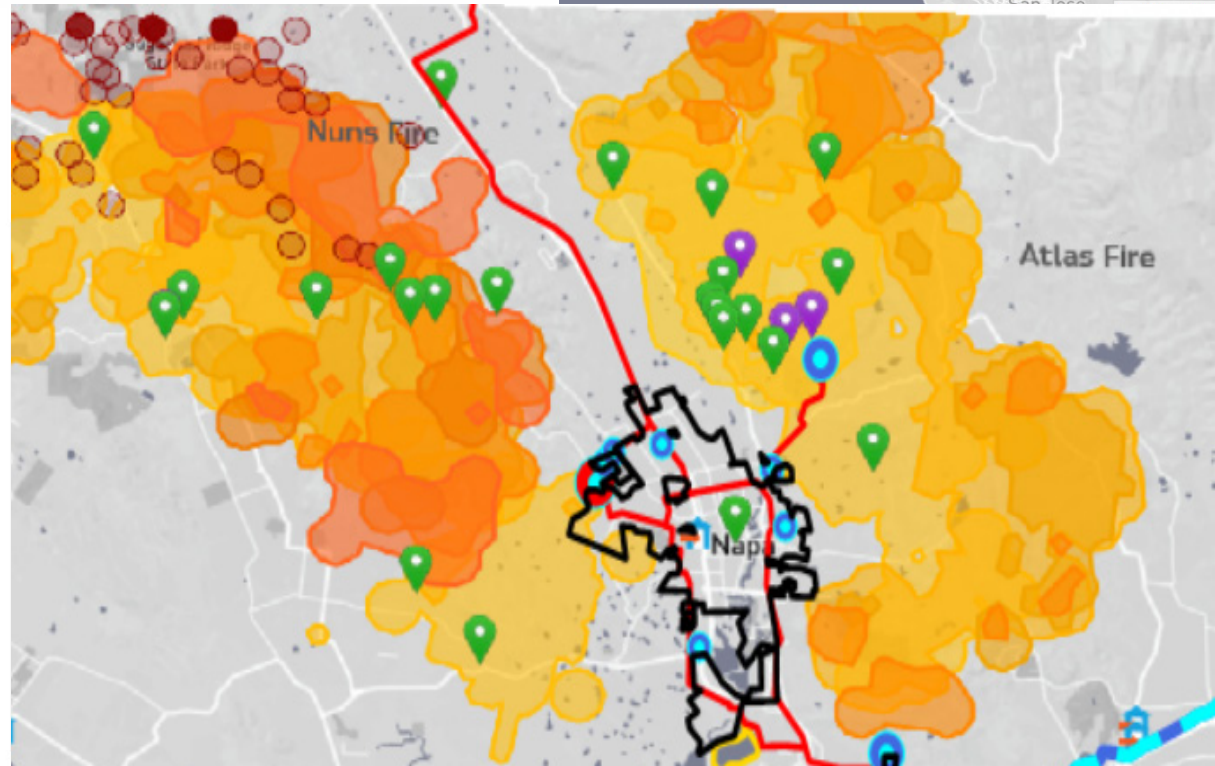
Day 5

Day 6

Today

[See up-to-date air quality](#)

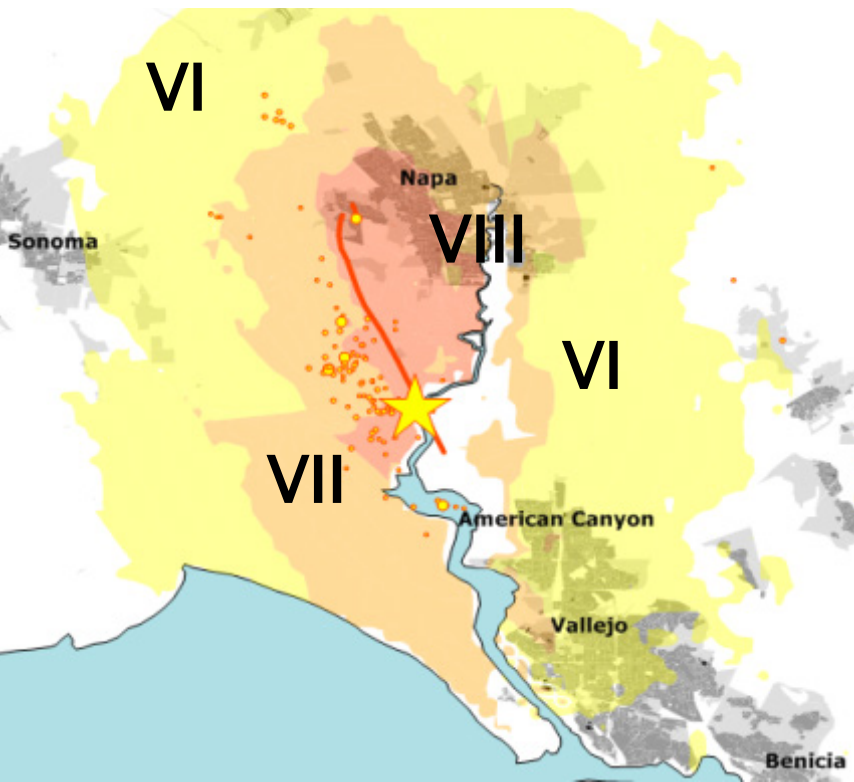
[Hide pins](#)



Outline

- Overview
- Response
- Lessons Learned

August 24, 2014, 0320
West Napa Fault, Mw 6.0
\$362 million-\$1 billion



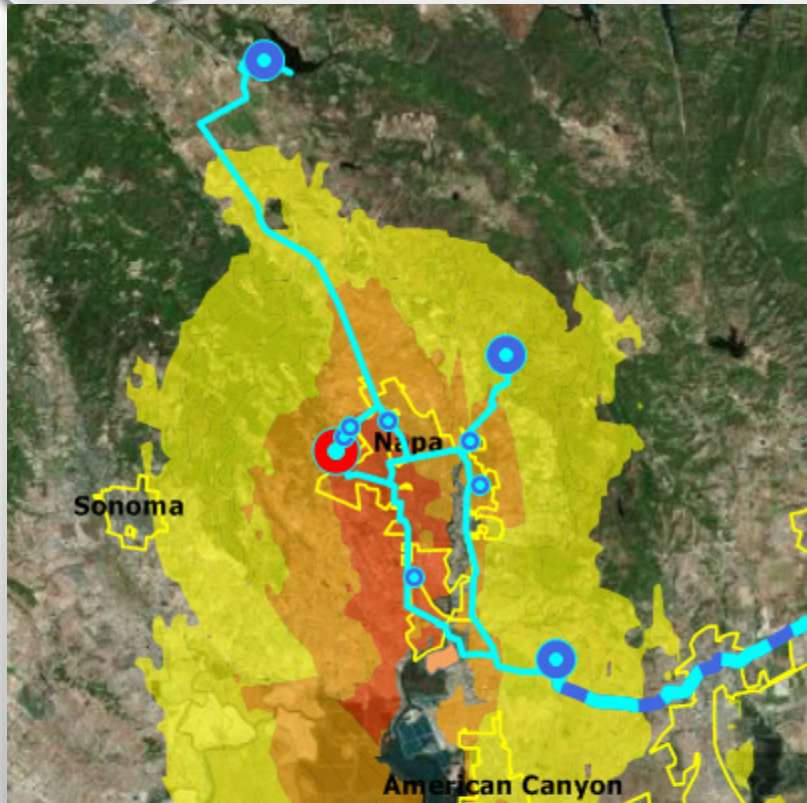
≥ MMI	Population
VI	199,000
VII	90,000
VIII	36,000



WATER – CITY OF NAPA

System

- Serves 80,000 population / 25k services
- Three sources of water (43 MGD capacity)
 - Lake Hennessy (31,000 A-ft), WTP (20 mgd, built 1982)
 - SWP / Barwick Jamison WTP (21,900 A-ft pa entitlement, WTP 20 mgd, built 1967)
 - Milliken reservoir, a seasonal backup source, 1400 A-ft.
- 12 tanks
- 337 miles distribution pipes



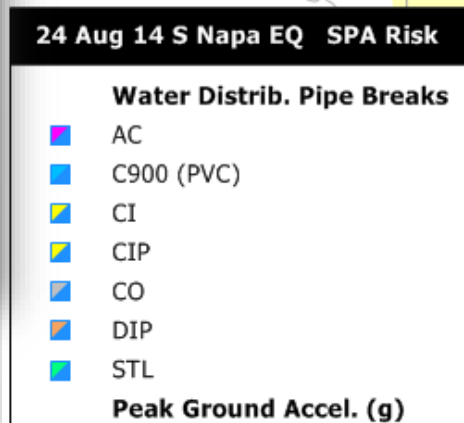
	C900	DIP	CI	AC	RCCP	STL		
Under 20 years	6,600	225,600				100	232,300	13%
20-40 years	24,300	370,500	83,400	14,100		100	492,400	28%
40-60 years		12,300	466,700	167,200	9,900	59,800	715,900	40%
60-80 years			173,100			100,400	273,500	15%
80-100 years			55,100				55,100	3%
Over 100 years			10,300				10,300	1%
Sum	30,900	608,400	788,600	181,300	9,900	160,400	1,779,500	100%
	2%	34%	44%	10%	1%	9%	100%	

Impacts to Water System

- ❑ 241 leaks (120 in first few days)
- ❑ No damage to Treatment Plants, Pump Stations or Dams
- ❑ No immediate damage to Transmission Lines (4 leaks occurred in weeks after event)
- ❑ Only 1 of 12 Storage Tanks Damaged



CITY OF NAPA – WATER DISTRIB. PIPE BREAKS



Material	Breaks	% <u>Brks</u>	<u>Brks/mile</u>
<u>Asb. Cement</u>	8	5%	0.23
C900 (PVC)	2	1%	0.34
Cast Iron	123	75%	0.82
Concrete	1	1%	0.53
Duct. Iron	18	11%	0.16
Steel	3	2%	0.10
<u>other / unk</u>	7	4%	
Tot	163	100%	

CITY OF NAPA – ROCKSLIDE, MILLIKEN TRANSM. LINE BREAK



Credit: City of Napa

CITY OF NAPA – MONTANA “B” TANK SLOSHING / DAMAGE

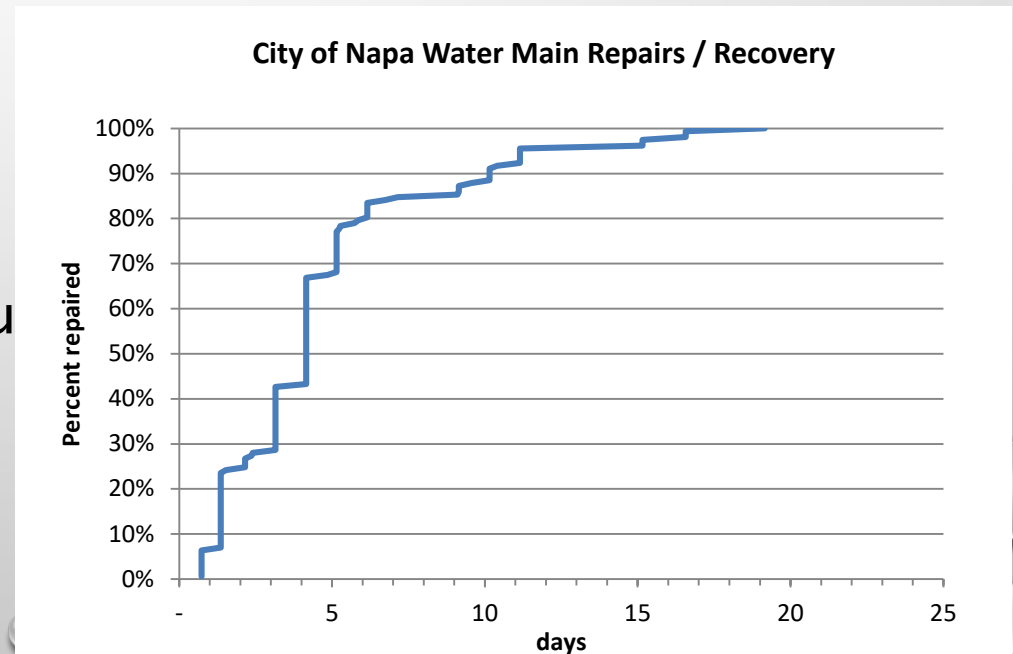
- 1 million gallons
- 67' diam
- 37' high
- Welded steel with CGI roof supported by steel columns and redwood beams
- Unanchored
- 6' sloshing
- Damage to roof
- No elephants foot
- Motion at outtake pipe slip joint
- Tank drained quickly due to nearby break



Credit: City of Napa

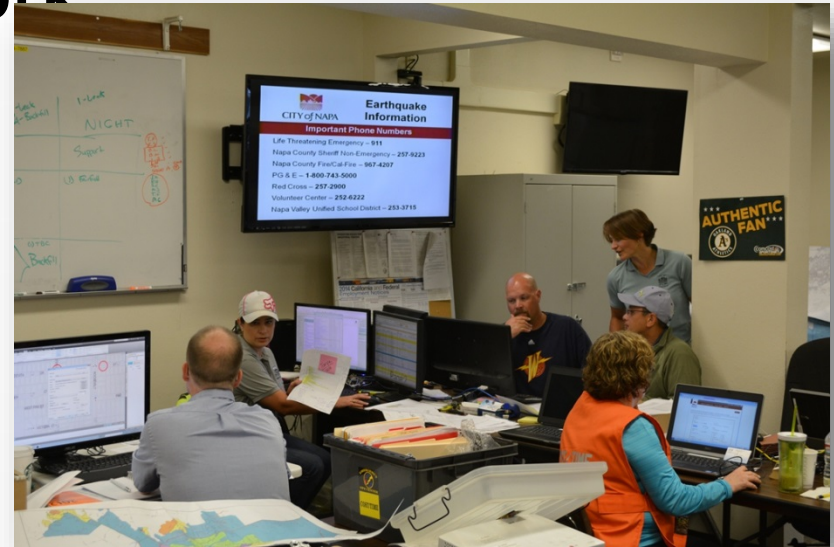
CITY OF NAPA – OPS / RECOVERY

- City flowed water from N and S sources to maintain pressure
 - estimated total loss of water about 100 Acre-feet
- NWD was aided by regional utilities through the CalWARN (www.calwarn.org) system, as follows:
 - Alameda County WD – 1 truck/crew
 - City of Fairfield – 1 truck/ 2 crews
 - CCWD – 1 truck/crew
 - EBMUD – 5 truck/crews
- All crews arrived with fully spare parts stocked trucks, and were released by 29 Au
- NWD spent about \$200k on spare parts.



Response – Day 1

- ❑ Emergency Operations Center (EOC) Opens
- ❑ Department Operations Center (DOC) Opens at Corp Yard
- ❑ Employees Report to Work



Response–Day 1 (System Assessment)

- ☐ Major Facilities – Confirm dams and treatment plants are ok
- ☐ No transmission line damage
- ☐ 60 distribution leaks by early AM
- ☐ Ramp up treatment plants – FEED the leaks to maintain positive system pressure

Response – Day 1 (We need HELP)

- ❑ Called in 4 contractors (3 have on-call emergency contracts with City)**
- ❑ CalWARN offered resources within 1 – hour of quake**
- ❑ Requested five (5) Type III Water Distribution System Damage Assessment and Repair Teams**
- ❑ CalWARN teams scheduled to arrive at 11AM next day**

Response – Day 1 (Logistics)

- ☐ **Ordered fuel tanks for Corp Yard**
- ☐ **Established 12-hr shifts for staff**
- ☐ **Stockpiled backfill material**
- ☐ **Opened potable water stations**
- ☐ **Prepared leak packets – maps, USA tag**
- ☐ **Secured hotels, shuttle cars, gas cards, food for CalWARN crews and other mutual aid**

Response – Day 1 (Boil Water Advisory)

If you lost water service completely for any period of time after today's earthquake, the City of Napa advises you to use one of these three options:

- use bottled water for drinking and cooking
- boil tap water for one full minute before use for drinking or cooking
- use water for drinking and cooking from one of the water stations set up by the City, on Pearl Street one block west of Main, or at the Las Flores Center on Linda Vista Avenue

All tap water remains safe for bathing and other household uses. If you water appears cloudy but you did not lose service, let the tap run until the sediment clears.

Once all the broken water lines are repaired and City water has been restored and tested, the City will rescind this advisory notice.

Call 707-257-9544 with questions. The Water Division is staffing phones 24 hours a day while repairs are made.

This notice is provided to you by the City of Napa (System No. 2810003) in collaboration with the State Water Resources Control Board, Division of Drinking Water.

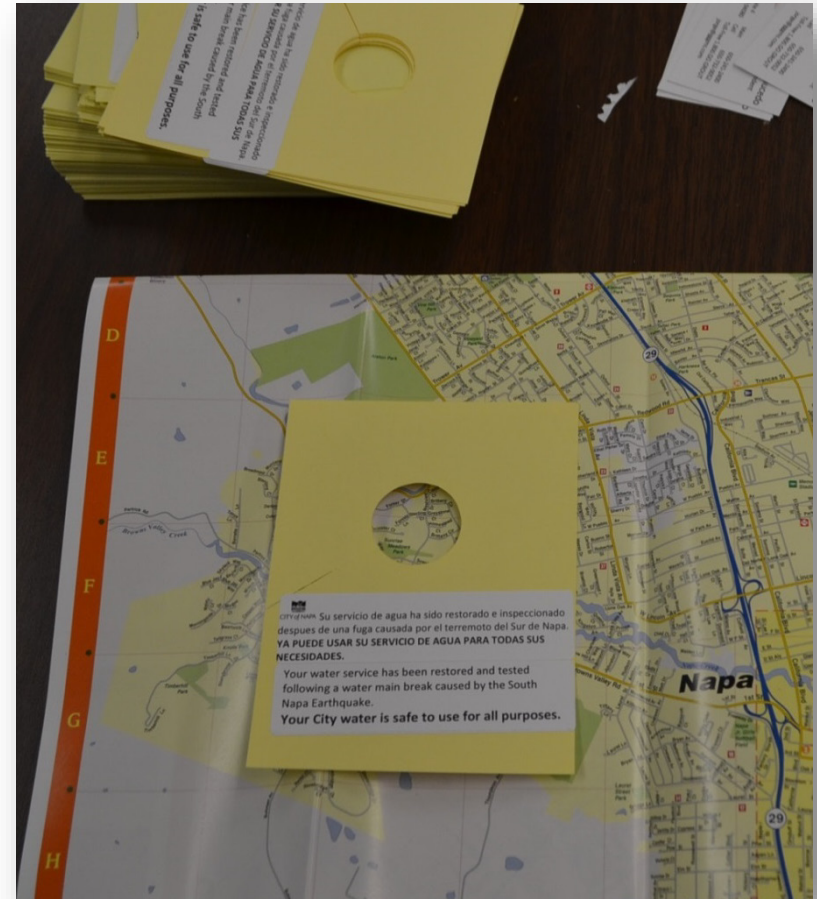
Response – Day 1 (Water is Safe Notice)

Your water service has been restored and tested following a water main break caused by the South Napa Earthquake.

Your City water is safe to use for all purposes.

Su servicio de agua ha sido restorado e inspeccionado despues de una fuga causada por el terremoto del Sur de Napa.

YA PUEDE USAR SU SERVICIO DE AGUA PARA TODAS SUS NECESIDADES.

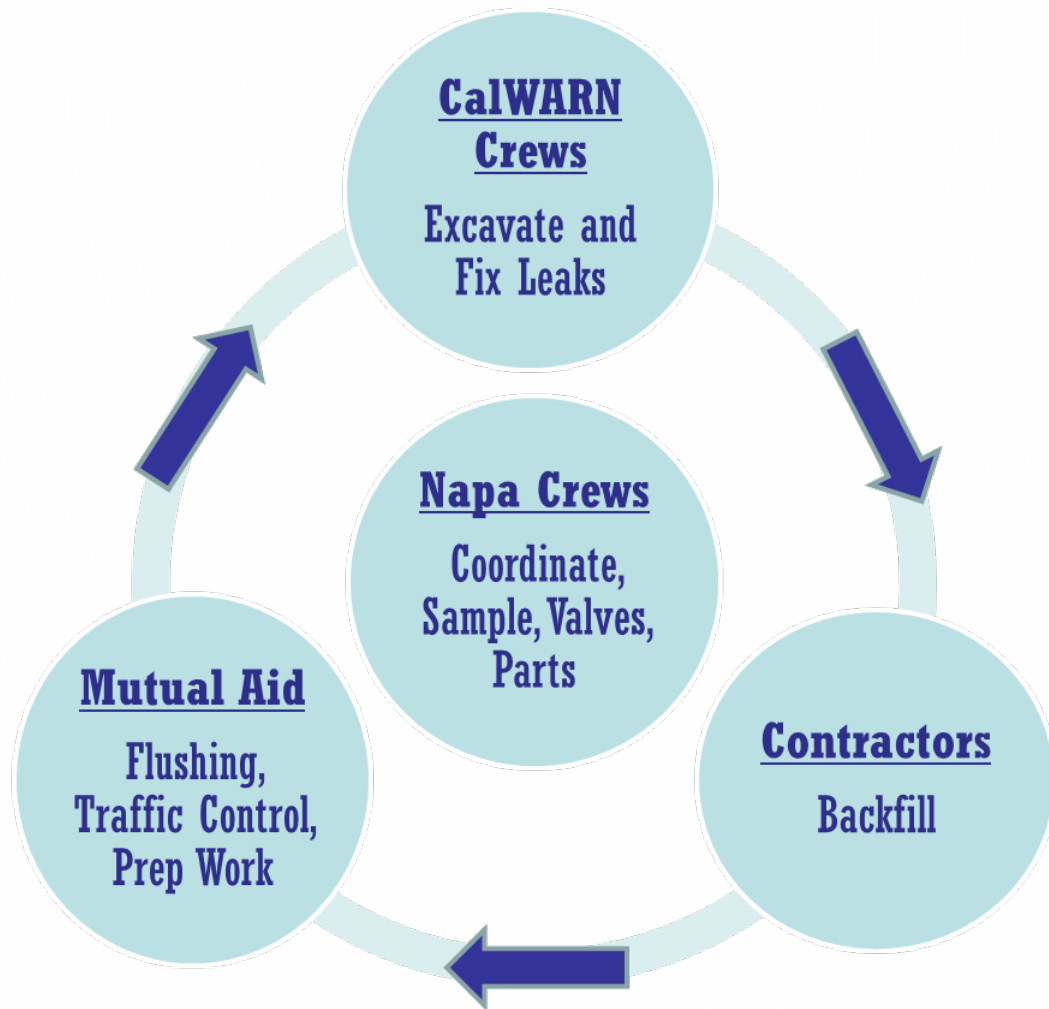


Response – Day 2

- ☐ 90 leaks confirmed
- ☐ Ordered repair materials
- ☐ Finance asking for cost estimates for damages
- ☐ CalWARN Crews Arrive



Response – Day 2 (The DANCE)



Response – Day 2 (The Paperwork)



RESPONSE – DAY 3

- ❑ 120+ leaks confirmed**
- ❑ Need more crews – Request to CalWARN**
- ❑ Established goal to release CalWARN and Mutual Aid by Friday for Labor Day Holiday**
- ❑ USA Locate issues cause delays**

Response – Day 4-6

- ❑ 2 additional CalWARN crews arrive
- ❑ The “Dance” Continues
- ❑ Crews have a goal to be done by Friday



Response

120 Leaks
in 5 Days!



Lessons Learned

- ☐ Join your state/regional WARN Now
- ☐ Damage could have been much worse
- ☐ Be ready to take care of Mutual Aid
- ☐ Pre-build potable water stations
- ☐ Develop a tracking and recording system for leaks now
- ☐ Assign water “inspectors” to geographic areas to provide accurate info on leaks

Lessons Learned

- ☐ Assign leak crews to do what they do best
- ☐ Need more administrative support for record keeping, check in/out, and cost estimating
- ☐ Crews need to document each leak with photo, parts, labor, time
- ☐ Customers were understanding
- ☐ Relationships and Networking Matters – AWWA

Lessons Learned – Plan Ahead

- ☐ Materials – pipe, leak clamps, etc.
- ☐ Backfill material – availability, stockpile areas
- ☐ Dump locations – asphalt, spoils
- ☐ Food (what if restaurants are closed?)
- ☐ Fuel
- ☐ Hotels
- ☐ Shuttle Vehicles to Hotel

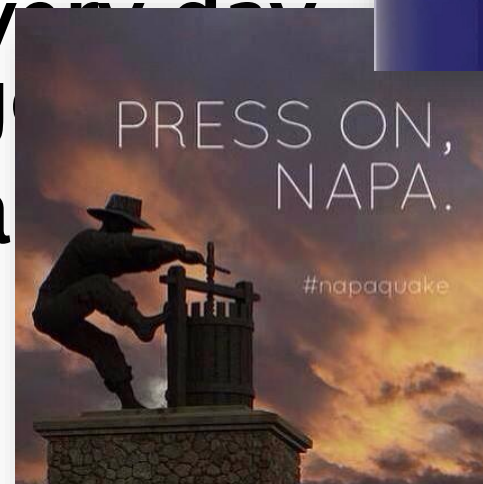
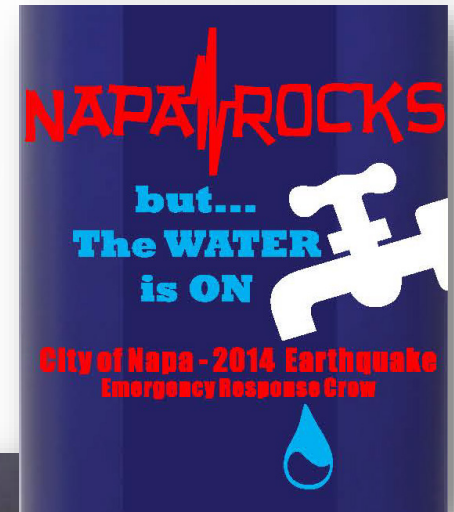
Lessons Learned – Plan Ahead

- ☐ Damage Assessment and Cost Estimating
- ☐ Mapping
- ☐ Documenting the Event – photos, ICS forms
- ☐ Communicating with your Regulator
- ☐ How you would staff the “Dance”?

Summary

WHEN IT HITS

- ☐ Assessment – Each event is unique
- ☐ Be ready to adapt – Every day brings a new challenge
- ☐ Mutual Aid is Necessary
- ☐ Plan Ahead
- ☐ Document Everything



Questions?

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SPA Risk LLC. 2014. "24 August 2014 South Napa Mw 6 Earthquake Reconnaissance Report. Pp. 62. Available at: <http://www.sparisk.Com/Pubs/Spa-2014-Napa-Report.Pdf>

