



MANAGING DROUGHT AND REDUCING WATER LOSS DURING SYSTEM MAINTENANCE AND REPAIR

A White Paper by Hydra-Stop

California has been experiencing harsh drought conditions regularly since 2000, and much of the West Coast, Mountain Region, and Southwest is increasingly struggling with drought on a recurring basis. When potable water is at a premium, any kind of system maintenance or repair can become a nightmare. Under the best of conditions, a repair can be costly in terms of both money and water loss. But during a drought, it can be a public relations nightmare. Imagine how it must look to customers who are living under usage constraints as several hundreds of thousands of gallons of water go gushing down the street.

MITIGATE WATER LOSS

Public water system (PWSs) can avoid both the cost and the terrible optics associated with repairs during drought conditions by

using insertion valves. An insertion valve can reduce the amount of water lost during a repair by several orders of magnitude. This not only mitigates the strain on the water supply but also cuts costs and reduces environmental impact while preventing bad publicity.

PRESERVE WATER

Anytime a section of pipe needs to be repaired or replaced, there is going to be water loss. During drought conditions, any water loss is going to negatively impact customers, the environment, and the utility's reputation. An insertion valve allows utilities to isolate the area of maintenance or repair while maintaining service to the rest of the network. The insertion valve installation process results in minimal water loss — sometimes as few as 10 gallons.

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A conservative estimate shows that even for small pipe diameters, the amount of water saved by using an insertion valve over a traditional pipe replacement process is around 100,000 gallons (Figure 1). For larger diameters, over a million gallons of water loss can be prevented.

Valve Size	Estimated Gallons Saved for Each Insertion Valve Installation
4	75,000
6	100,000
8	125,000
10	165,000
12	225,000
14	375,000
16	600,000
20	1,000,000
24	1,750,000

The table above shows the estimation of water loss savings from using an insertion valve compared to the traditional pipe

replacement process. These figures were calculated using [high-end average water lost](#) from main breaks. The amount saved was then extrapolated based on various valve sizes. These figures also presume an insertion valve will be used just once in its lifetime to help control a main break. As a permanent asset, additional uses of the valve will increase the amount of water saved.

REDUCE ENVIRONMENTAL IMPACT

Unless the PWS is part of a reuse system, any water loss from a pipe repair is going to end up in storm sewers and potentially draining into natural water ways. Chlorinated water is great for consumption but is detrimental to the natural environment, killing bacteria, algae, and even fish. This, in turn, can harm those parts of the ecosystem that are dependent on them. During times of drought, when available source water is running low and ecosystem stability is stressed, it is critical to reduce the amount of chlorinated water that ends up in the environment.

ENSURE FIRE SAFETY

If the system is shut down for a repair, part of the water district may be left without a means to combat fire. Hydrants could be cut off and commercial sprinkler systems will only have access to the water available in a tank or static water source, which may not be enough to fight a serious blaze.

The odds of a fire starting are significantly increased during a drought and fire can spread quickly due to dry conditions. While the probability of a fire during a system

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shutdown may not be high, it is still a risk that no PWS wants to take. Using an insertion valve during a repair not only avoids a full water system shutdown but also ensures there will be enough water in the distribution system for firefighters and/or commercial fire suppression systems to do their job quickly enough to contain the damage.

MAINTAIN WATER QUALITY (AND CUSTOMER TRUST)

Contamination is a common side effect of traditional repairs. In the best-case scenario, it can lead to discoloration and turbidity. In the worst-case scenario, it means issuing boil orders. During a time when water is scarce, this kind of contamination can be upsetting to customers who are already dealing with drought restrictions. Installing an insertion valve mitigates opportunities for water contamination, reduces the likelihood of discoloration and turbidity, and eliminates the need for boil orders.



REDUCE BAD PRESS... AND CREATE GOOD PRESS

Water scarcity has been major headline news for years now. So, when a PWS experiences a significant drop in water quality or water supply during a drought, it is likely to attract media attention. Unfavorable optics and increased public pressure can lead elected officials to demand why such water loss was allowed to happen and, more importantly, how it could have been avoided.

The irony is that if a PWS avoids a disaster by using an insertion valve, the inverse doesn't hold. Customers will continue to drink and shower as though nothing has happened. As such, it falls on the utility to proactively promote how it used foresight and leveraged modern technology to avoid losing precious water, protect the environment, and maintain water quality. After all, drought or no drought, good news is always a scarce commodity.



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