



NO-DES Water Main Flushing

Water Resources and Civil Infrastructure | Stanford University

Why do water mains need annual flushing?

Over time, sediment and biofilm can collect inside drinking water mains, which can contribute to corrosion and reduction of chloramine disinfectant residual.

The traditional method: Unidirectional flushing (UDF)

A section of pipe is isolated using valves. Then, a fire hydrant is opened and the rapid movement of water picks up sediment and scours away biofilm inside the pipes. Though UDF is more efficient than older methods, it is still time consuming and results in discharges of large amounts of water to hardscapes and storm drains.

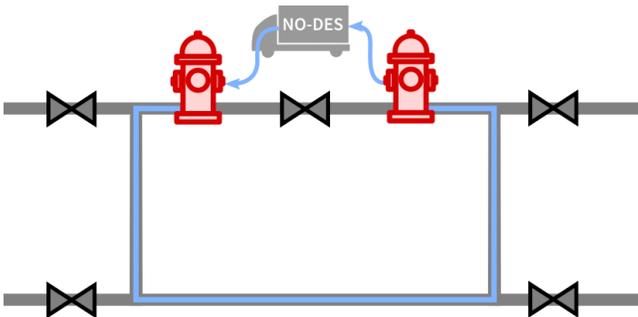


In UDF, flushed water must be dechlorinated and discharged to landscaped areas or the storm drain.

NO-DES pilot saves water and time

Stanford works with a contractor to operate a Neutral Output Discharge Elimination System (NO-DES) trailer to flush the entire campus. The State Division of Drinking Water approved the plan, which included safeguards such as equipment disinfection and regular bacterial tests to monitor water quality.

How NO-DES works



A Stanford technician closes valves at strategic locations to create a loop of pipe. The NO-DES pumping truck connects at two hydrants and pushes water through the loop at high velocity.



Water taken from one hydrant is sent through two sediment filters in the NO-DES truck and pumped back into the distribution system via a second hydrant. Little to no water is discharged.



The control panel includes turbidity and chlorine meters to monitor water quality and pressure gages to track filter and pump performance.

Compared to UDF, the NO-DES pilot:

- ◆ Reduces water use by 90% (roughly 3.5 million gallons saved, enough to supply campus for more than 2 days)
- ◆ Does not risk flooding of low-lying areas
- ◆ Does not require night shifts for technicians
- ◆ Reduces the volume of water dechlorinated and discharged to the storm drain
- ◆ Takes less time (7 versus 12 weeks)