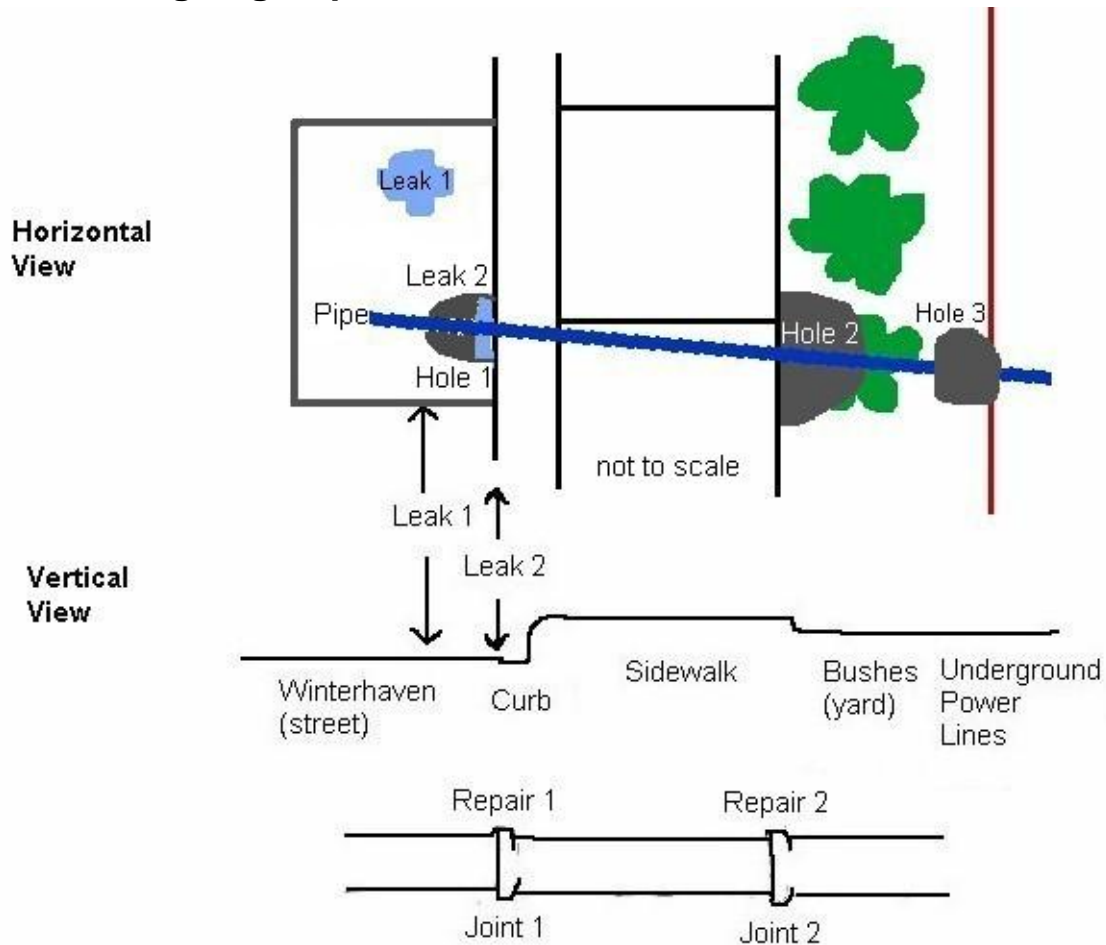


Ongoing Repairs of the Winterhaven Street Leak



BACKGROUND

Irrigation water was coming up through the street on the east side of Winterhaven, south of Leonora. There were 2 major leaks. Leak 1 is about 50 inches into the street. A sinkhole developed at this site. Leak 2 is the biggest. It is at the border between the street and the curb. Mesa wanted us to shut down irrigation until the leak was repaired. RWCD allowed us to continue irrigation as long as the repair was scheduled and no water was taken on the lateral with the leak. Several contractors bid on the repair. The lowest bid was selected. I did the troubleshooting, barricade rental, blue stake arrangements, city coordination, etc. which saved us a considerable amount of money. On October 25, 2007, Hole 1 was dug and a gap in Joint 1 (directly beneath Leak 2 in diagram) was repaired with hand tools by a licensed contractor. Rented flashing barricades surrounded the work area.

SITUATION

Since it was in the street, Hole 1 could not be left open for monitoring after the gap in Joint 1 was filled. At the next irrigation, street leaks were still present--though not as great. The

homeowner and us traced the pipe into his yard and began to dig. The top of the pipe is about 32 inches underground. We tunneled under the sidewalk and uncovered Joint 2 (Hole 2 in diagram). The area was monitored during the next irrigation, but the Hole 2 filled with water before the origin of Leak 1 and Leak 2 could be determined. We tunneled deeper and exposed more of Joint 2. RWCD gave us 1 hour of water prior to the November 25, 2007 irrigation. All of this water was directed into the lateral. A significant amount of water shot out gaps in both sides of Joint 2. A few minutes later, Leak 1 and Leak 2 appeared in Winterhaven. No leakage water showed up in the Underground Power Line area (Hole 3 in diagram).

Both Joint 1 and Joint 2 had large gaps without an O-Ring in place. The contractor said that it looked like the pipe had not been put in properly. Most likely Joint 1 and Joint 2 were both leaking. After the gap in Joint 1 was filled, the Joint 2 leakage water could not get through the sidewalk and flowed under it. The water surfaced at the easiest place which was at the border between the curb and street (Leak 2) which just happened to be immediately above Joint 1. This may also account for Leak 1 which is off to the side and not directly above any pipes. The gap in Joint 2 was filled by the same contractor on December 5. Hole 2 was left open for monitoring during the last irrigation before dry up.

On December 8, all of the irrigation water was directed into the lateral. Nothing came out Joint 2 and Hole 2 stayed dry. Leak 1 and Leak 2 did not appear. About 2 ½ hours into irrigation, water appeared in Winterhaven in a different location from Leak 1 and Leak 2.

FUTURE PLANS

There has been a lot of rain and the ground is extremely wet. Natural groundwater combined with irrigation may have put water in the street that will not happen under normal circumstances. We will monitor the street during future irrigations to see if there actually is a leak. If there is a leak, the exact location and state of the irrigation system need to be determined.

A 14 inch diameter cement pipe carries irrigation water underneath the street. The pipe comes in 7 foot segments. Hole 3 did not show any leakage water during the November 25 irrigation. Hole 2 did not show any signs of leakage water during the December 8 irrigation. This means that if there is a leak, it is most likely in a joint underneath the street. If the gaps in Joint 1 and Joint 2 are any indication of workmanship, the pipe was not laid well and there may be joint gaps all the way across the street—about 5 joints. This is the worst case scenario.

Setting standpipes correctly and taking all of your water will help relieve the water pressure inside the pipes.