

Highlights

Why We Did This Audit

Members of the public expressed concerns to the City Auditor's Office about water meter maintenance. We also heard complaints about inconsistent meter readings, such as water usage spikes, or meters indicating water usage on days when customers were not home.

Water meters are subject to wear and deterioration, and over time, lose accuracy. Meters should be periodically tested and replaced to protect against inaccurate meter usage readings. Inaccurate readings can result in over or under charges to customers.

Objective

This audit focused on testing and replacement of 5/8" water meters, which are primarily residential meters. The objective was to determine whether Water Services appropriately tested and replaced water meters to ensure meter accuracy.

Background

Water meters measure the volume of water that passes through a meter. The Water Services Department has about 170,000 water meters in service; the majority of these are 5/8" meters.

The Meter Field Services Division tests the accuracy of newly purchased and in-service water meters. Water Services' testing compares meter performance to accuracy limits set by the American Water Works Association at defined flow levels and volumes. A set of three tests measures the meter's accuracy at high, medium, and low flow rates.

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PERFORMANCE AUDIT

Improvements in Water Meter Testing Needed

What We Found

The American Water Works Association (AWWA) recommends testing a statistical sample of certified new meter shipments to verify accuracy and to maintain confidence in the manufacturer's accuracy testing. Although Water Services tests new meters, the department does not follow some new meter testing recommended practices.

In fiscal year 2018, 47 out of 246 new meters failed their accuracy testing. Although the department's policy says to return failed meters to the manufacturer, all 47 failed meters were installed. Installing a failed meter can lead to inaccurate registration of water usage.

Customers may overpay for water that they did not use or Water Services may lose revenue because of under reported water usage.



Samples of new meters tested were not randomly selected and sample sizes were not large enough to confidently draw conclusions about the accuracy of the entire batch. Some new meter shipments were not tested. Testing a statistical sample of new meters from a shipment provides reasonable assurance that the entire batch of meters is accurate which would confirm the manufacturer's certified accuracy test results.

Water Services was not using the recommended flow test order when testing the accuracy of meters pulled from service and some pulled meters were tested repeatedly, both of which can change a meter's performance from what it was when in the field. Two pulled meters that failed accuracy tests were reported as passed. Most pulled meter tests were performed within department timeliness goals.

Water Services does not have a water meter replacement strategy. AWWA recommends establishing a replacement strategy based on the ongoing testing of meters in service and that a meter testing program maintain an accurate and readily available database of meter records. Water Services does not have either of these components. Meters have a limited life span and will deteriorate and lose peak efficiency over time. Water Services should use its own accuracy testing data to develop its replacement strategy because each utility's water has its own chemical and physical characteristics that affect meter performance.

What We Recommend

We make recommendations to improve meter testing processes and develop a water meter replacement strategy based on ongoing testing of the department's own meters.

Management agreed or partially agreed with most of the recommendations.