WATER LOSS PREVENTION PLAN

Distribution Systems

A distribution system consists of a network of pipes, valves, fire hydrants, service lines, meters, and pumping stations. The system delivers water to homes, businesses and industries for drinking and other uses. This water also is used for fire protection. The network of pipes, pumping stations, and service storage reservoirs must have sufficient capacity to meet maximum water demands plus fire-fighting requirements to designated hydrants and while maintaining adequate water pressures throughout the water distribution system. Valves are necessary to isolate portions of the distribution system for cleaning, maintenance, repairs, and making additions to the system. The distribution system shall be free of cross connections with unapproved water supplies which could allow contamination to be introduced into the system.

The distribution system can also serve as an incubator for bacterial growth if water is allowed to remain for excessive periods of time and chlorine becomes depleted. This fact places extreme emphasis on daily verification of the chlorine levels and system flushing as may be indicated.

The overall appearance of your pump stations and elevated tanks indicates the level of care and professionalism the District places on the operation of the water system. If the facilities are dirty and run down, in the need of painting, an overgrown with weeds, you will be unable to convince the public that you are doing a good job. YOUR RECORDS SHOWING THAT YOU ARE DELIVERING SAFE DRINKING WATER TO YOUR CONSUMERS WILL MEAN NOTHING TO VISITORS AND NEIGHBORS OF YOUR FACILITIES UNLESS YOUR FACILITIES APPEAR CLEAN AND WELL MAINTAINED.

UNACCOUNTED FOR WATER LOSS

Unaccounted-for water (UFW) loss is defined as the difference between water delivered to the distribution system and water sold. UFW includes two basic components: physical losses and commercial losses. Physical losses represent water lost from pipe leaks in distribution systems, in house connections, and from overflows in distribution tanks. Commercial losses represent water used but not paid for (i.e.from illegal connections and inaccurate metering). UFW loss will result in an out of pocket monthly revenue loss. CCWD produces its own water at a reasonable cost as the raw water source is a high-quality requiring minimal treatment. Therefore chasing small leaks may need to be considered lower priority at times due to work load conditions when trying to complete other important in house tasks. All leaks must be considered serious and not to be pending for long periods as numerous leaks will tally to a great water loss.

Keeping this loss at a minimum requires constant data gathering and analysis and knowing how to interpret the data so that losses can be found as quickly as possible. The following offers examples of how this data can be used.

Daily -
- Note pumpage / psi readings at all pumping locations from SCADA
  Compare to historical average
  If different, reconcile

- Look at all Zone Meter totalizer and flow rates readings from SCADA
  Compare to historical average
  If different, reconcile

When indicated prepare downstream daily balances to zone meter readings where possible to pinpoint area loss.

Examples

(1) Routinely 67% of the water measured in the Hwy 1112 MM will be pumped through the Perry Park booster station. If the amount pumped or inlet/discharge pressure suddenly changes from the normal then operations needs to look for the cause.

(2) Routinely 80% of the water pumped through the Ghent Eagle station pump station goes to KAWC thru the Wheatly master meter (Telemetry monitored). If this percentage changes appreciably, suspect a leak on whichever side of the MM experiencing the increase. Look at pump runs, tank level drop/fill rates. Verify inlet and outlet pressure readings to determine of water loss.

<u>Other Checklist Items for Leak Detection</u>

1. Using sound-intensifying instruments, listen on fire hydrants, valves, meters, mains and services. Do this periodically. Partial closure of valves may be necessary.

2. If leak sounds are heard, conduct a detailed investigation by listening on each meter in the area of the leak sound. Meters are convenient points for making contact with the underground piping system. Listening on the meter allows you to check the meter coupling and curb stop for leakage. Sounds heard at the meter may be a leak on the service or on the street main.

3. If meters are widely spaced, listen over the main at closely spaced intervals with sound-intensifying instruments to locate leaks in the main.

4. Check all stream crossings for water bubbling up through the streambed or for the stream to be carrying a much larger volume of water than normal. Also, use the creek crossing valves where there are two isolation valves placed on both sides of waterway with the inlet flow having a bypass meter tapped around the isolation valve. Valve off both valves and open leak detection meter for any flow to determine if any leakages exist. Continue to install more of these devices over time at all water way crossings.

5. Check out sudden increases in metered consumption. This could indicate a service line leak.

6. Investigate complaints from customers who report hearing water running in their house piping. This may be caused by a service leak, by a leak in the neighbors, service or by a leak in the main.

7. Investigate complaints of low pressure in the distribution system. This could indicate that a large leak has occurred. This condition may be reported by customers or by the fire department.

8. Be alert to the possibility of unmetered use such as hydrant theft (contractors) or delinquent customer theft and damages.

9. Monitor the all metered water. (Compare readings from the master meter at the plant, which measures all water entering the distribution system, to all metered readings from customers from the same period of time.) Be cautious of production meter being accurate.

CCWD Control Water Loss Strategy

CCWD will continue over time to install more zone meters and equip them with either telemetry or cellular communication to allow operators to be warned when the distribution flow rates or pressure changes in a manner that detects water leaks for the distribution system or large leaks for customers and large theft events. These investments will be done within our work force as to gain assets at the greater value and to avoid any long term debt. By installing our own equipment will be installing at a greater quality than any other third party for the fraction of cost. Therefore, creating ownership by our employees as it will be built per our specifications. Note: the current telemetry system is programmed to call out operators immediately within 20 minutes for operator to respond quickly.

We will also keep installing isolation valves in our distribution system. This creates a method to isolate sections with a flow meter indicating where the leak and reducing the amount of terrain to search within. This speeds the finding of the leak and reducing the cost of man hours to pin point the leak. Sometimes the man hours to search and find the leak are greater than the cost of the current leakage. Daily operation goals are to allow routine service orders to be executed early in the morning from the previous business day of being processed through the administration office ticket order system. Once the daily work orders are executed early then allows the field crews to make the additional enhancements to allow for the water loss strategies to be executed with the other preventative maintenance tasks that are required to maintain a healthy water system.

CCWD will continue to look into more water loss preventive components as technology is improved. Currently, installing cellular end point on any larger meter of 2 inch and greater. Even though this is great tool to have for CCWD to be able to tell when production increases and determine is not a distribution leak but a customer leak. It will save resources at times but it will also reduce revenues because the customer will be able to make repairs in more timely manner.

CCWD
Carroll County Water District
205 Main Cross Street Ghent, Kentucky 41045 Phone: 502-347-9500 Fax: 502-347-9333

STRATEGIC PLAN

VISION

To see Carroll County Water District become and remain a standard setting, model water system for the state of Kentucky.

MISSION

Proudly serve quality water at a great price to our customers of Carroll, Gallatin, and Owen Counties.

Goal #1: Remain true to our mission and at the same time keep a focus on our vision.

Objective #1: The District will maintain and improve the operating and distribution infrastructure to meet the needs of the expanding customer base.

Objective #2: The District will maintain, develop or change personnel policies in order to ensure quality personnel can be retained on staff.

Objective #3: The District will ensure adherence to all State & Federal rules by appropriate sampling, monitoring, and testing in a timely manner.

Goal #2: Provide training for all employees and board members consistent with the responsibilities of the positions.

Objective #1: The District will schedule training designed specifically for board members offered annually by PSC and KRWA.

Objective #2: The District will ensure that all employees are educated and certified to function where assigned and that adequate training including software is made available as required for all positions.

Objective #3: The manager of the district will stay abreast of changes in regulatory standards and seek training if needed for him and/or staff.

Goal #3: Maximize benefits to district customers.

Objective #1: The District will constantly seek new opportunities that would benefit the customer while keeping costs under control.

Objective #2: The District will strive to update as required and keep its SCADA system in good working order so that service to the customers can remain maximized.