

Whitley County Water District

WATER LOSS PREVENTION AND LEAK DETECTION PROGRAM

The Whitley County Water District has a distribution system that was originally comprised of a number of community water systems. Over the years, management has obtained funding to replace the aging water pipes in the small communities and combine them hydraulically where geographically feasible. Currently, the Water District purchases water from the City of Corbin via two master meters, the City of Williamsburg via nine master meters and McCreary County Water District via one master meter. In total there are approximately 579 miles of transmission mains, over 3800 customer services, 4 pumping stations and 4 storage tanks. Water loss has been a continuing problem for the Water District partially due to abnormally high water pressures in parts of the distribution system. However, the Water District is committed to allocating a sufficient amount of resources to identify and correct water loss, thus improving its operating efficiencies.

The following plan outlines processes and procedures that the Whitley County Water District will conduct on a routine basis (both in a reactive and proactive mode) to identify and repair water line leaks, identify and monitor un-metered water usage and reduce its overall water loss.

1. ROUTINE PROCEDURES (Daily/Weekly/Monthly):

- A. COMMUNICATIONS: Monthly meetings to address the status of water loss by personnel from the office, distribution department and board members are planned to assure a unified team effort to minimize water loss.
- B. MASTER METERS: Read & record all master meter readings throughout the distribution system at approximately the same time each day:
 - Wholesale Master Meters
 1. Corbin #1 on Highway 26
 2. Corbin #2 off of Highway 26
 3. Highway 25 W from City of Williamsburg on U.S. 25 (3-point)
 4. Highway 92 East from City of Williamsburg off U.S. 25
 5. Bank from City of Williamsburg on U.S. 25
 6. Briar Creek from City of Williamsburg
 7. Adkins from City of Williamsburg (Savoy I)
 8. Tackett Creek from City of Williamsburg (Savoy II)
 9. Savoy Road from City of Williamsburg (Savoy III)
 10. George Hayes Road from City of Williamsburg (Savoy IV)
 11. Under-Pass $\frac{3}{4}$ meter from City of Williamsburg (Old George Hayes)
 12. Highway 92 West from McCreary County Water District

- C. **RECORDING READINGS:** All master meter readings shall be recorded in log books or on spreadsheets. Record readings of both registers on compound meters.
- D. **CONSISTENT METER READING SCHEDULES:** Establish a schedule wherein all customer meters are read at approximately the same time each month to ensure that any inconsistencies are identified and potential service line problems are identified and corrected.
- E. **FIELD PERSONNEL RESPONSIBILITIES:** All distribution personnel (meter readers, service techs, etc.) shall immediately report to their supervisor any identified water leaks, tank overflows, telemetry problems, or other concerns that are presently, or could, result in water leaks or loss. A work order will be generated by the supervisor to address the problem immediately or at the earliest possible time, given the urgency of the problem.
- F. **OFFICE PERSONNEL RESPONSIBILITIES:** All office personnel shall immediately report any customer reported leaks, tank overflows, pressure problems, or other issues to the field supervisor. The office personnel will generate a work order and coordinate with the field supervisor to make a determination as to whether a field crew needs to be dispatched immediately or later, based on the urgency of the problem.
- G. **RECORDING DATA:** Daily and monthly records (via computer data bases, manual logs, or spreadsheets) shall be maintained by appropriate supervisory personnel to record and analyze the following information:
- Daily and weekly master meter readings
 - Pump station run times
 - Estimated water losses from line breaks, tank overflows, hydrant usage, etc.
 - Metered customer water sales by route
 - Other un-metered water usage
- H. **DATA ANALYSIS:** Water purchased and usage data obtained and recorded shall be evaluated and analyzed on a daily/weekly/monthly basis to determine:
- Water production and purchase amounts
 - Metered usage
 - Known un-metered usage
 - Known losses from line breaks, etc.
 - Water loss by distribution zone
- I. **FOCUS ON DISTRIBUTION SYSTEM ZONES:** The Water District's present system has twelve separate zones as determined by the above master meters.
- Master meter readings will be entered into an Excel spreadsheet daily to identify excessive usage that may indicate a water line break.
 - Monthly water loss reports will be compiled for each of the twelve zones.
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- Data analysis will be focused on water usage and loss in each of these major zones in order to prioritize leak detection efforts based on potential water loss in each area.

J. **METER TESTING AND REPLACEMENT:** Pursuant to PSC regulations, customer meters will be tested and/or replaced on a periodic schedule to ensure that they are registering water accurately.

- Meters are to be tested as follow:
 1. Larger meters (master meters and customer meters 4" and larger) shall be tested on an annual basis.
 2. All 3" meters will be tested every two years.
 3. All 2" meters will be tested every three years.
 4. All 1" and ¾" meters will be tested or replaced new every ten years.
- All meters will be replaced as warranted.

2. LEAK DETECTION PROCEDURES

A. **DISTRICT PERSONNEL:** On a routine basis (weekly or bi-weekly, as routine system operations permit), District personnel will be assigned to leak detection shifts after hours (typically 11:00 PM to 3:00 AM). Customer usage is minimal at this time and allows field personnel to go valve to valve (and often meter to meter) with listening devices and detect abnormal flows. Personnel will perform leak detection in those areas with the highest known water loss, based on routine data collection and analysis.

B. **OUTSIDE CONSULTANTS:** Outside consultants will be utilized as circumstances and funding dictate. The Water District has routinely utilized the services of Kentucky Rural Water (specifically Danny Stinson) in this process and has also utilized the services of Kenvirons, Inc. for leak detection.

3. CAPITAL IMPROVEMENTS

As funding permits, the District will prioritize and acquire/install the following:

A. **INTERNAL MASTER METERS:** Additional master meters for subsections of the system will be prioritized and acquired in order to more accurately monitor water usage and identify water loss throughout the system.

B. **BY-PASS METERS:** As funding permits, additional by-pass meters will be installed to further isolate smaller portions of the distribution system in order to more accurately identify and correct water loss problems in specific areas of the system.

- C. FLOW METER: One of the most important tools in detecting water usage and loss is a portable flow meter. As funds are available, the Water District will purchase one of these units.
 - D. GATE VALVES: All gate valves will be exercised as recommended in the Kentucky Division of Water Regulations. Valves which fail to operate properly will be replaced as funding permits.
 - E. MAPS: The Water District will maintain updated distribution system maps. Accurate maps depicting line size and location are vital to leak detection.
 - F. REPLACEMENT OF OLDER TRANSMISSION MAINS: As noted above, much of the distribution system has been replaced as the original community systems were merged hydraulically. As funding permits, new projects to replace remaining older pipes in the distribution system will be developed.
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