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Leak Detection Plan

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We define two types of loss.

1. Accounted for loss. Known and repaired leaks or line breaks. illegal hook ups, Bills not paid, and unused or abandoned meters.
2. Distribution system loss. Water paid for but not accounted for.

ACCOUNTED FOR LOSS

Leaks and line breaks

Southern Madison Water emphasizes to each employee to visually check for leaks on a daily basis while doing daily task. Managers routinely monitor and physically inspect leak zones. We also encourage our customers to report all leaks and pressure changes. We answer phones on a 24 hour basis.

When a leak or break is detected it is immediately reported to the manager and a work order produced to document it. Leaks are

repaired promptly. The tech will also fill out leak form estimating the amount of water lost. These forms are collected by office staff to calculate and report on a monthly basis.

Illegal hook ups, bills not paid, abandoned meters

After the monthly meter readings are completed. Southern Madison goes thru a re-check process identifying meters with changes of 100% +/-, inactive meter usage, and incorrect manual reads. These meters are visually checked to identify customer leaks, and illegal hook ups. Customers are notified of changes in water use and illegal meters removed.

Southern Madison Water preforms cut offs for customs in our water system who also have sewer hook-ups thru Berea municipal sewer system. Combined with the amount of our water customers subject to cut offs is not practical with a limited staff. Southern Madison has worked diligently at trying to keep the customers within a two month window of payment and avoiding in large balances not being paid down on customers leaks and large users. This also allows us to identify those customers who have vacated without notifying us.

Fire departments and flushing

Currently we have three separate fire departments in our service area. Any alerts to testing of fire hydrants and fires is recorded.

Any flushing of lines for customers or for maintenance is recorded and reported on a monthly basis.

DISTIBUTION SYSTEM LOSS

Our distribution systems contains over 200 miles of pipes, valves, pumps, tanks, and meters. This aging system is across variable

elevations, creek crossings, continued growth and rocky soil detecting a leak is difficult.

Southern Madison Water purchases water thru Berea Municipal Utilities. This water is accounted for by Southern Madison thru 14 master meters and readings sent to Berea Municipal on the first of the month for monthly purchase total. The difference in water purchased, accounted for loss, and water billed to customers is considered distribution system loss.

All 14 master meters are read daily between the hours of 8:00 am and 10:00 am recorded and compared with historical data. Any variance is reported and inspected. Monthly reading of customer meters should be done on the first of the month excluding holidays and weekends. This process should take no longer than three days to complete. This ensures that customer usage and water purchased will be as close as possible.

The billing software allows us to identify how many customers and billed usage is attached to each master meter. During the billing process this is compared to purchased water from Berea Municipal to detect problem areas where more water is purchased then billed. We define these as leak zones.

When the water purchased in a zone is substantially more than billed the following procedures, resources, and tools allow us to define the problem.

1. SCADDA system.

All tank levels and pumps operations are monitored 24 hours a day with alerts sent to managers for any changes in tank levels and pump system run times. This is also recorded daily to check

for any variances. We are awaiting approved grant money to update the system.

2. GPS Mapping

The recent purchase of a GPS device and mapping software is allowing us to map the entire distribution system. Valves, lines, and meters. This process will take time to complete. This will allow us to save time finding valves, mark unknown lines, test and repair areas for leaks.

3. Flow Test

In areas where we assume there is a leak however it is not visible and not detectable with valves we rely on the Ky Rural Water organization techs and the use of a flow meter to pin point areas.

With the availability of grant funds and recent surcharge we are discussing the need to purchase and operate our own flow meter.

4 Engineering services

With the addition of several developments, road changes and expansion, and lack of a complete map system. It is necessary to enlist the services of the engineers who determined the changes in our water distribution network when we have loss areas that may have flows diverted incorrectly causing them to loop thru the master meter twice. It is also necessary to check all backflow preventers and ensure that valves are in the correct on/off position.

5. Replacement and testing of master meters and customer meters

Master meters are inspected, tested for accuracy and repaired as needed.

We currently have around 1700 manual read meters. These meters are at the end of their life span and in need of replacing. Currently we are waiting on approved grant money to complete the replacement and for additional reading computers. This will eliminate human error and cut down on the amount of time it takes to read meters monthly.

6 Maintenance

Replacing of known problem lines, exposed lines, and proper functioning of meters, valves, pumps and tanks.

Several projects have been identified and the use of the recent rate increase and surcharge fees will be used for improvements.