



## Water Billing and Meter Reading Services Department

### ACCURATE MEASUREMENT FROM WATER METER

A meter is installed in the water service of a home to accurately measure the water being consumed. The accuracy of the meter is guaranteed by its manufacturer when it is purchased by the water utility. Limits on the accuracy are set by the standards established for the water industry by the American Water Works Association (AWWA). These standards assure the homeowner that all water used will be accurately and fairly measured.

Situations do arise in which the homeowner questions the accuracy of the water meter. This may occur when an old, worn meter is replaced by a new one. The higher accuracy level will result in a larger water bill. A leak in the customer's plumbing system or an unusual usage of water may also result in an abnormally high water bill. ***In these situations, the customer often asks the utility company if the meter registration could be speeding up, registering more flow than was originally going through the meter. The answer is, "No". A water meter registration cannot speed up.*** Perhaps a brief explanation of the construction and operation of the water meter will serve to verify the truth of this statement.

In a water meter, the motion of the measuring element, called a nutating disc, is transmitted by a system of magnets and gears to the sealed register which records the flow in the convenient units of measurement such as gallons. The register reading is thus dependent on the number of nutations of the disc. The reading is a true measure of usage only when the meter has been properly calibrated. For a new meter, this calibration takes place at the manufacturer's plant. For a repaired meter, the utility company checks the calibration by running an accuracy test on an accurately calibrated test bench in their meter shop. After proper calibration, the meter will continue to register accurately only so long as the disc continues to make the correct number of cycles for each gallon of water passed through the meter. If any conditions should develop whereby the disc is compelled to make other than required number of cycles per unit volume, the meter reading will not be accurate. Under ordinary working conditions, a number of factors may cause inaccurate registration, even after a comparatively short interval. However, in every case, these factors will cause the meter to under-register water flow, and in no case, will the meter be caused to over-register water flow beyond the allowable accuracy limits established by the AWWA.

Examples:

**Excessive Wear** – Excessive wear of the moving parts of the water meter may be caused by the over-speeding because the meter being used is too small for the water demand at the residence. The results of the excessive wear of the measuring chamber are slippage and under-registration. Wear causes the clearances between the disc and its housing to increase, allowing



water to slip through un-metered. Excessive wear in the gear train may cause the gears to slip or to bind. In either case, if the meter does not stop entirely, under-registration will result.

**Temperature Extremes** – Water meters are not affected by water temperatures up to 80 degree Fahrenheit. Excessively high temperatures can cause expansion of the measuring chamber creating unusual friction or bind in the chamber. The result is slippage and under-registration or a complete stoppage of the water meter. High temperature water can be caused by a backup from an improperly installed water heater. Quite often the water can be hot enough to cause permanent damage to the internal parts of the meter. Low temperatures have no noticeable effect on working parts unless the water freezes, which will cause damage to the meter. Once again, the meter will either stop completely or under-register.

**Corrosion** – All the metals used in the construction of the meter are affected by the corrosive action of water, although the action is very, very slow with most waters. Corrosion will cause excessive clearances to develop in the measuring element which will allow water to slip through un-metered, causing the meter to under-register use.

**Materials in Suspension** – Foreign materials carried in suspension in the water have a tendency to fill the space between the disc and the measuring chamber thus affecting registration. All meters are provided with strainers which will retain the larger particles in the suspension, but the strainer will soon become clogged if the water is not kept reasonably free from suspended matter. Sand is especially destructive and water utilities take care to keep sand from reaching the water meter. Any suspended matter may cause a bind between the measuring element and its chamber causing it to slow down, which, once again, will result in under-registration of the water meter use.

RCM Utilities is well aware of the problems that can occur in their water meters. The time interval between replacements should be based on local conditions and the amount of consumption. Normally this period is between 10 to 15 years.

RCM Utilities carefully monitors any unusual usage of water. Excessive usage resulting from a leak is brought to the customer's attention by information provided on the monthly bill. Abnormally low usage may be an indication to the utility company that the meter in that residence is suffering from one of the problems outlined above. The RCM would investigate the problem and possibly replace the meter if it is determined it is not functioning per manufacturer specifications. If you a customer notices an unusually low bill, they should contact us as soon as possible.