Meters for More Efficient Use and Conservation of Irrigation Water

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The use of meters in irrigation operations, to obtain more efficient use and conservation, is becoming almost as standard practice as the use of meters to measure the gasoline we put into the tanks of our automobiles. In New Mexico, as elsewhere, water is not only scarce, it is expensive. Therefore it behooves everyone to try to attain the highest possible efficiency of operation. The use of meters to tell accurately how much water is being used is of great importance. I think none of us would be satisfied to drive into a service station, have the attendant stick the nozzle into the tank, count verbally to twelve then say "OK, you owe four dollars." Yet, I have seen some methods of arriving at quantities of irrigation water which are just about as accurate as that.

My remarks here will deal with two basic types of propeller actuated meters. The Open Flow type meter is used at gate structures, siphons, turnouts, etc., where the water flows into an open ditch or canal. The Tube Type meter is used where the flow is through a tube, pipe, penstock, or pump discharge. Meters can be supplied to register in any standard unit of measurement, i.e. gallons, cubic feet, miners inches, acre feet, etc. The shape of the flow conveyance can be round, square, rectangular or any other, so long as a definite cross section area is maintained. And the conveyance must run full at all times. Meters can be equipped with Indicator Heads to show the Rate of Flow. Also, available are instruments for remote indication, totalization, and recording of flows at any distance from the meter location.

Now rather than try to expound a lot of theories or ideas about the use of meters, I would prefer to tell about a few places where meters are installed and operating, their purpose, and results obtained. There have been cases where the saving of water has resulted as a sort of secondary consideration. Some of the primary purposes for which meters are installed can be ordinary measurement, efficient control of flows, equitable distribution, basis of allocation, etc. The proper use of the information supplied by the meters does, in nearly all cases, result in the saving of water.

A few installations are -

U. S. Bureau of Reclamation, Albuquerque.

Large Type S Open Flow meters are installed on two siphons under the Rio Grande River. The Corrales Siphon, 60" in diameter and Atrisco

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1/ Sparling Meter Company, El Monte, California

Siphon, 78" in diameter. Here the meters serve to tell how much water is diverted from the east side to the west side of the river and also indicate the rate of this flow in cubic feet per second.

Salt River Valley Water Users Association, Phoenix, Arizona.

Here Type R Open Flow meters are installed in the Cross Cut Canal and are used to control the flow so that the flow into this canal can be held equal to the amount of water ordered by the users farther down the canal. The meters can also totalize the amount of water passed in any given period.

Buckeye Irrigation Company, Buckeye, Arizona.

On this project the Type L Meter is used to check the accuracy of farm deliveries at the farmer's turnout.

Arlington Canal Company, Arlington, Arizona.

Here irrigation water was in such short supply that frequently there was not sufficient water in the lower end of the canals to give the adjacent farms any delivery at all. By using meters to give accurate deliveries and make judicious allocation of the available water all the farmers were enabled to stay in business.

Wellton-Mohawk Irrigation and Drainage District, Wellton, Arizona.

This project has about 700 individual farm turnouts, all 30" in diameter, and all equipped for measurement with Type L Open Flow meters. The farmer pays in advance for a specified number of acre feet of water, then each irrigation delivery is deducted from his credit balance in exactly the same manner that money is withdrawn from a balance in the bank. Meters are also used at various points in the canal system and now consideration is being given to installation of meters in the discharges of the big pumps at the lift stations. These meters would serve to promote more efficient pumping operations and to check the pump efficiency as to kilowatts of power consumed, in addition to providing accurate records of the amounts of water delivered into the canals. In this project where every inch of water is charged against him the farmer naturally strives for the best possible use of his water and goes all out to prevent waste.

Orange County, California.

In Orange County every well is required by law to be equipped with a meter on the discharge. These are the Tube Type Low Pressure Line Meters. Water is taken from the All American Canal and put into the underground water strata, then pumped out by the farmers. On the

basis of the amount of water pumped the farmer is assessed for his pro rata share of the cost of operation of the project. Because of this cost he naturally tries to conserve water. Mr. Dick Lindsey, University of California Farm Adviser, was quoted in the Los Angeles Times as saying that only a 5% to 10% improvement in irrigation practices will save 10,000 acre feet of water a year.

U. S. Indian Irrigation Service, San Carlos Project, Arizona.

Because of the shortage of water in San Carlos Reservoir all irrigation water is pumped from wells. Tube Type Low Pressure Line Meters are used on the discharges of pumps and because power costs are very high they serve to give a good check on pumping efficiency. Also when the time comes to establish water rights based on past usage the meter records will be of inestimable value.

In closing let me emphasize the fact that a meter cannot produce a drop of water. Nor can it, by itself, save a drop of water. But proper use and application of the information supplied by the meter can result in more efficient operating practices and consequent conservation of the water available today.