



Project Fact Sheet

New Devices for Volumetric Metering of Delivered Water - Trash Shedding Propeller Meters

GOALS

- Provide farmers and irrigation districts with practical means of measuring the volumes of water delivered, spilled, and reused.

PROJECT DESCRIPTION

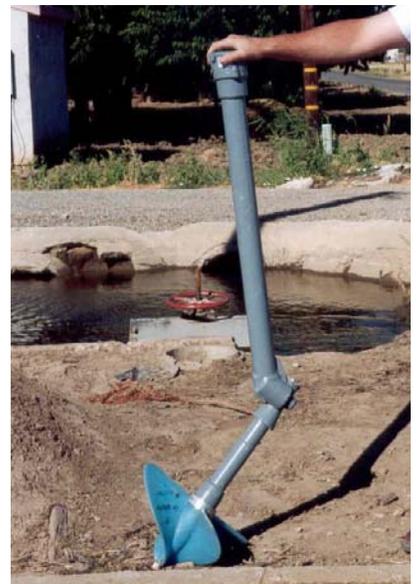
The most popular flow rate and volumetric metering device for irrigation district-turnouts is the propeller meter. It is simple to understand, robust, and relatively easy to maintain. Many irrigation districts have short, full pipe sections at the turnouts into which propeller meters can be installed. The single biggest problem in those situations is trash in the water that catches on the propeller or support arm.

A propeller meter configuration has been proposed in which the propeller is mounted either backwards or behind the support shaft, but this configuration has never really been implemented with a serious effort. Global Water Technologies of Gold Run, California recently built a "backwards" configuration propeller meter, but the technology which that company uses for the moving parts, totalizer, etc. is not recognized in the industry as being durable.

Some of the mainstream propeller meter manufacturers now have excellent bearings and magnetic drives on their propeller meters, which would allow them to reconfigure the support shaft and the orientation of the propellers, themselves. Water Specialties and McCrometer (2 major manufacturers of propeller meters in the irrigation district market) have made some initial improvements in their design to help minimize this problem and are interested in participating in this project. This project will enable ITRC to work with propeller meter manufacturers to develop some prototypes of trash-shedding propeller meters. The meters would be calibrated in the manufacturer's test facilities, and then field tested by ITRC in an irrigation district with trash problems.



Canal Moss problem at Patterson with Standard Propeller



Sparling propeller meter installed at PID 2N36

BENEFITS TO CALIFORNIA

Successful research will impact numerous energy issues. These include:

- Reduction in groundwater pumping (because surface water deliveries will be more flexible, and water tables will remain at higher levels), thus reducing electricity consumption.
- Elimination of future increases in groundwater pumping which will occur if the present water delivery infrastructure is not significantly improved, thus reducing escalations in energy consumption.
- Increased yield per unit of energy consumed, thus improving efficiency ratios.
- More efficient fertilizer practices, thus reducing indirect energy consumption.
- Planning for water transfers throughout the state.
- Reduced vehicular travel (due to automatic systems and remote monitoring), thus reducing fuel energy use and reducing engine emissions, and
- Reduced deterioration of groundwater quality and quantity.

FUNDING AMOUNT

California Energy Commission: \$101.797

PROJECT STATUS

- The first season of field-testing for trash shedding propeller meters began at Patterson Irrigation District (PID). A separate comprehensive field testing report has been prepared that summarizes the design, installation and operation of the advanced flow meters installed at two farm turnouts in PID. The performance of each device will be assessed based on factors such as sensor calibration, ease of installation, performance in the field, maintenance requirements, and accuracy over a range of conditions, and costs.
- The McCrometer reverse propeller meter was installed in PID 3N22.
- The McCrometer propeller meter was read by the ITRC during a site visit on July 15th. The totalizer read 1,108,100 cubic feet (25.4 acre-feet). The volumetric delivery data will be compared to PID billing records at the end of the testing season.
- The Sparling propeller meter has been installed in PID 2N36. The propeller meter was installed in a concrete turnout box at the discharge end of an 18-inch concrete pipeline from the canal. The Sparling propeller meter was read by the ITRC during a site visit on July 15th. The totalizer read 94.59 acre-feet (9459 x 0.01 acre-feet). The district operators are periodically checking the flow meter during the season while deliveries are being made. The district has accounted for 93.06 acre-feet of water delivered to this turnout from June 19th to July 15th, 2002.

FOR MORE INFORMATION

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