

CLIENT	Grand River Dam Authority
INDUSTRY	Electric & Water Management Public Utility
TECHNOLOGY	Remote Automated Water Meter Reading

THE OPPORTUNITY

GRDA's (Grand River Dam Authority) was created in part "...to control, store and preserve...the water of the Grand River and its tributaries..."

Municipalities, rural water districts, commercial concerns and home owner's associations, draw *raw water* from Grand, Hudson and Gibson lakes and tributaries. The water provides drinking water, irrigation and various resources.

GRDA desired to centrally monitor and measure the raw water consumption around three large lakes and tributaries in northeast Oklahoma. The data gathered was needed to assist GRDA in its conservation efforts and to support raw water usage billing.

The entire project included over fifty (50) intake pipes at forty (40) isolated locations, geographically dispersed over 100,000 acres and 1725 miles of shoreline.

THE PROBLEM

- 1) *Technical* – Raw water often includes debris, mud and even zebra mussels; sucked through a pipe by powerful pumps that are harmful to metering equipment, clogs filters and causes inaccurate measurements.
- 2) *Economics* – The revenues produced by raw water is relatively low and meter installation costs are hard to justify.
- 3) *Geographical* – The locations were far apart and usually in isolated areas, including some on floating docks, and many without electricity or available communications.
- 4) *Engineering* – Pipes of various compositions and sites of various configurations required a versatile solution.
- 5) *Access* – Some locations required a FWD and others required water access via boat, demanding that the solution be easily transported and modular.
- 6) *Politics* – Prior to this project, raw water was self-monitored and self-reported by the consumer who desired to maintain control.
- 7) *Unknowns* – A high number of unknowns and variables caused vendors to mitigate risk by inflating their project bid.

THE SOLUTION

A big part of the solution was accomplished during the competitive bidding process. We had to find the solution that was flexible and predictable in order to keep the bidding price attractive. Cyte was able to provide the prime subcontractor a system priced at about 60% less than the next lowest bid, using high-quality dependable accurate meters & equipment.

Cyte worked many months with various vendors to identify the most effective technologies available. We then integrated the most cost-effective products into the **OtterDog™ Remote Water Metering Station** which is now GRDA's Raw Water AMI (Automated Measurement Infrastructure).

The **OtterDog™ Remote Water Metering Station** takes advantage of recent

advancements of the GF Signet Magnetic Flow Sensor. This particular insertion magmeter outshines its competition in design, implementation, performance and actual real-world accuracy. The installation and maintenance (what little there is) can usually be performed safely with the pipe under pressure. The sensor protrudes only one-tenth of a diameter into the pipe and has no moving parts.

For communications we needed to conserve power consumption yet remain flexible to satisfy a variety of configurations. The OtterDog™ solution has an onboard computer with versatile networking capabilities offering ZigBee/802.15.4 support plus cellular (3G, 2.5G, 2G or 3G), Wi-Fi, Licensed Radio, GPS and local storage options. Several physical interfaces are supported as well, including Ethernet, serial, USB.

THE BENEFIT

OtterDog™ requires little power and can operate for weeks without sunlight or grid power. When power does fail, OtterDog notifies you of the problem well in advance of a failure. Priced well under the competition, the OtterDog™ Remote Water Metering Station is a great investment.

- Patented Magmeter Technology
- No moving parts
- Bi-directional flow
- Empty pipe detection

- Flow rate range 0.05 to 10m/s (0.15 to 33 ft/s)
- Accurate measurement even in dirty liquids
- No Pressure Drop
- Corrosion resistant materials; PP or PVDF with SS, Hastelloy C or Titanium