

WATER AND ENERGY EFFICIENCY
BUSINESS CASE

FOR THE

OKMULGEE MUNICIPAL AUTHORITY

WATER METER CHANGE-OUT &
CONVERSION TO FIXED-BASE
AUTOMATIC METER READING
PROJECT

DWSRF PROJECT NO. P-40-1020708-03

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INTRODUCTION

The City of Okmulgee is in an ongoing effort to increase energy efficiency by modernizing facilities and equipment. In this effort, we have determined that we must implement an Automated Meter Reading (AMR) System and replace all existing water meters throughout the City's water distribution area. This effort will reduce energy consumption by utilizing energy efficient methods and equipment. The City anticipates an overall savings of \$227,581.00 in the Utility Billing Department, mostly through reduced vehicle usage.

PURPOSE

The objective is to upgrade the existing facilities and equipment while helping offset the cost through water revenue increase and operational cost avoidance to accomplish the goals of the project, which are as follows:

- Reduce energy consumption and water loss while improving distribution efficiency and customer service.
- Eliminate citizens' private property intrusion by monthly meter readers
- Eliminate citizens' confrontation with meter readers – our world is not as safe as it used to be
- Improve the accuracy of water metering systems to capture lost revenue
- Improve Billing Cycle Times & accuracy to reduce number of re-reads and citizen complaints
- Increase citizens satisfaction by improving Public Safety

EXISTING WATER SYSTEM

The City of Okmulgee city limits encompass around 12 square miles with a 2009 population estimated at 12,558. Water service is also provided to the City of Morris and several rural water districts as well as the Muscogee (Creek) Nation. The estimated total population served is 40,000. The amount of water produced at the water treatment plant in calendar year 2009 was 1,683,634,000 gallons. The total water usage (billed amount) for the Okmulgee System in calendar year 2009 was 1,441,102,500 gallons per year. This indicates a water loss or unbilled percentage of 8.56%. Of the 1,441,102,500 gallons, 541,031,300 gallons was sold to rural water districts and the City of Morris. The remaining 900,071,200 gallons was sold to businesses, industries, and residents in or very near the City of Okmulgee.

PROJECT BACKGROUND

The majority of water meters throughout the City of Okmulgee were installed prior to 1990 and were assumed, based on industry standards and sample testing, to have greatly diminished accuracies. It was felt that installing an AMR system would accomplish the goals of increasing revenue, reducing operating costs and improving citizen satisfaction.

AUTOMATIC METER READING AND METER REPLACEMENT PROJECT

The City will replace each of its 6,100 meters with new high-accuracy meters fitted with encoded registers and radio transmitters. These transmitters will communicate consumption information via FCC licensed frequency to data collectors placed throughout the service area with a Wi-Fi backhaul to the City's utility billing offices. During the development of the project it was established through statistical sampling and testing of the meters that an increase in accuracy of 6% would be realized. Using 2009 billed numbers of 1,441,102,500 gallons, a 6% increase would result in additional billed usage of 86,466,500 gallons.

Size	Type	Qty.
5/8" x 3/4"	PD	5,280
1"	PD	500
1-1/2"	PD	26
1-1/2"	Omni T2	4
2"	PD	120
2"	Omni T2	130
3"	Omni T2	13
4"	Omni T2	10
6"	Omni T2	14
8"*	Turbine	4
Totals		6,101

Revenue Loss Recovery

The estimated increase in lost revenue through improved meter accuracy based on the annual consumption from FY 2007-2008 results in additional annual water and sewer revenue of \$206,500 based on an increased billing of 86,466,500 gallons. However these numbers were estimated before rates were increased in July of 2010. At present the increased billing of 86,466,500 would result in estimated increased revenues of \$268,045.

Operational Cost Avoidance

There will be energy savings from reduced pumping costs with the ability to identify leaks through improved individual meter accuracy but the actual amount of savings cannot be documented at this time. Last year, total electricity cost at

the water treatment plant was \$215,314.69. The City estimates that \$200,000.00 of this total was distribution pumping cost with rest of the cost paying for lights, HVAC, and other electrical devices. If one assumes that 2.5% of total pumping would be eliminated by more accurate measurement and quicker response to leaks, this would save the City and additional \$5,000.00 each year and would reduce kilowatt consumption by 7,692 kilowatts. Additional operational cost avoidance created by replacing manual water meters with a fixed based AMR system are reduced fleet expenses, reducing the amount of vehicle miles driven; reduced maintenance cost for vehicles; reduced number of service calls by vehicle and personnel and the reassignment of meter reading personnel thereby accomplishing more line repair and replacement and further reducing actual water loss. Examination of City accounting records indicates that a total of \$227,581.00 will be achieved through these actions as mentioned above.

Other Benefits

Constant consumption monitoring is a primary feature of an Automated Meter Reading (AMR) system. Based on the data collected, reports will be generated when any potential leaks are detected at the meter. Customer Service representatives can utilize these reports to notify customers proactively of potential leaks to prevent continued water loss. By reducing the time for leak detection down to matter of days from what currently takes weeks or months to detect with manual reads, we are able to both conserve water and reduce the cost to the customer. It is estimated that this will result in an annual water consumption reduction and energy savings. Additionally, when customers have concerns regarding their water consumption, Customer Service representatives will have access to hourly usage data for each account. This data may be presented to the customer in graphical format to assist the customer in evaluating their usage or detecting abnormal flow patterns (possibly due to failing water fixtures). This knowledge may result in decisions to reduce water consumption on the part of the customer. By automatically acquiring daily meter reads rather than being tied to a monthly meter read schedule, customers will have the flexibility to select billing cycles to more closely align with their personal budget and spending capacities. It is anticipated that this will reduce delinquencies in billing, resulting in fewer collection visits to properties and fewer call-outs to restore service.

Conclusions

This Business Case document has presented a number of the many advantages of proactively replacing the City's aging water meters and transitioning to a fixed base Automatic Meter Reading (AMR) system. Fixed-base AMR solutions are currently the most energy efficient means available for obtaining accurate meter read data. The ability to record hourly meter read data can provide the consumer with extremely valuable information that can be used to detect costly leaks or to curb wasteful water use habits. The data can additionally be used in aggregate

by City Engineering and Operations personnel to understand regional water demands for the efficient operation of the City's pumping facilities and design of a future water system.