MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

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SUBJECT: City of Monroe - Project No. 7227-01
Qualification for Green Project Reserve Funding

The purpose of this memo is to document the basis for determining that the City of Monroe DWRF Project No. 7227-01 qualifies for the green project reserve funding under the ARRA. This project is replacing 4.69 miles of cast iron water mains that are 60 to 80 years old and range from 4" to 8" in diameter. The following information was used to make this determination.

In 2007, the City of Monroe participated in the Drinking Water Infrastructure Needs Survey in which they reported a total pipe inventory of 250 miles. Of this total, 26% was identified as cast iron pipe, or approximately 65 miles of cast iron within the city. The city proposes to replace 4.69 miles of this cast iron pipe, or approximately 7% of the oldest, antiquated sections. The city also reports that the piping to be replaced has experienced 44 breaks over the last 10 years, which equates to almost 1 break per mile per year in which catastrophic failure often results in significant water loss.

For the city's fiscal year 2008, a formal Water Audit was performed that calculated 18% of the water delivered to the system was unaccounted or lost. System losses in excess of 15% are generally considered unacceptable in the waterworks industry. From 2005 through 2008, Monroe has averaged a total pumpage of 2.925 billion gallons of water. If 18% of that amount is unaccounted or lost, that equates to an average of 525.6 million gallons per year.

Although it is difficult to assign unaccounted water losses to specific areas of the distribution system without conducting a comprehensive leak detection program, there is little doubt that leakage is greatest in the older, unlined cast iron piping. Although Monroe is only replacing 2% of their total pipe inventory, they are replacing 7% of the most antiquated piping that is subject to the most frequent catastrophic failures and is likely experiencing the highest percentage of leaks.

If half of the city's system wide water losses are assigned to the portions with cast iron piping, the annual losses within the cast iron piping are over 260 million gallons per year. Assuming these losses are evenly distributed along the cast iron pipes, replacing 7% of this piping should result in a savings of approximately 18,000,000 gallons each year. That estimated water savings should be considered a conservative estimate because it is very likely that more than half of the city's losses are occurring within the areas where cast iron pipe is still in use and the city is likely replacing some of the most troublesome lengths of this pipe. It is also conservative

in that it does not account for potential catastrophic failures that will occur with increasing frequency if this aging piping is not replaced.

To maximize the anticipated improvement in water conservation, the new mains will be a better material, either PVC pipe or ductile iron wrapped in polyethylene. All new mains will also be installed at the grade that reduces galvanic potential, reducing external corrosion and subsequent pipe failure. To prolong useful life, all bolts on valves are stainless steel and hydrants are fusion bonded.

The new mains will also have an improved C factor of 120 for cement-lined ductile iron or 140 for PVC as compared to the existing unlined cast iron with C factors likely ranging from 80 to 90. The city estimates an energy savings from pumping water through the new mains versus the old ones of 150 KwH per year.

Based on the information provided by the city of Monroe, this project does qualify for the green project reserve funding due to the significant water savings (18,000,000 gallons per year) due to the elimination of leaks in antiquated pipes that are being replaced. The costs that qualify for water conservation/efficiency will be determined after bids are received and the amount of the loan established. At that point, the percentage of this loan provided by the ARRA can be applied to the amount to be spent on this portion of the project to determine the green project reserve.

REB:DLR