MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: Clifford Heckathorn, Chief
Revolving Loan and Operator Certification Section
Field Operations Division, Water Bureau

FROM: Richard Benzie, P.E.
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Lansing Operations Division, Water Bureau

DATE: October 2, 2009

SUBJECT: City of Marquette - Project No. 7284-01
Qualification for Green Project Reserve Funding

The purpose of this memo is to document the basis for determining that the City of Marquette, DWRF Project No. 7284-01, qualifies for the green project reserve funding under the ARRA. This project is replacing 4,871 feet of 6-inch and 8-inch unlined cast iron mains that are more than 100 years old. The following information was used to make this determination.

The city has developed a 20-year comprehensive infrastructure replacement plan to prioritize the replacement of water and sewer lines. This project will address some of the highest priority water main replacements based on age and condition. The city reports an average of 20 main breaks a year, primarily in the portions of the system still containing sand cast iron mains. Many of these mains are corroded and contain deposition that has significantly reduced the carrying capacity while at the same time, increasing the friction losses and energy necessary to deliver water through them, as illustrated in the accompanying photograph.

Over the last 5 years, Marquette has reported system-wide water losses ranging from 16% to 23% of the total volume delivered to the system. System losses in excess of 15% are generally considered unacceptable in the waterworks industry. For 2008, the total volume of water lost was in excess of 230,000,000 gallons, or the equivalent of 23.32% of the total water pumped.

It is difficult to assign unaccounted water losses to specific areas of the distribution system without conducting a comprehensive leak detection program. However, there is little doubt that leakage is greatest in the older, unlined cast iron piping. Although Marquette is only replacing 1% of their total pipe inventory in this first phase, they are replacing 100-year old, antiquated piping that is subject to the most frequent catastrophic failures and is likely experiencing the highest percentage of leaks. Therefore, it is expected that the replacement of these targeted mains will decrease the city's lost water to a much greater extent than the percentage of the city's total pipe inventory they represent. Every 1% reduction in lost water equates to 2,300,000 gallons based on 2008 records. Given the condition of these mains, the city should realize double or even triple this proportional savings.

The new mains will also have an improved C factor as compared to the existing unlined cast iron pipes. Therefore, the city estimates there will be a significant energy savings from pumping water through the new mains versus the old ones.

Based on the information provided by Marquette, this project does qualify for the green project reserve funding. The water main replacements will improve water conservation/efficiency by reducing water losses experienced from frequent breaks and on-going leaks. The costs that qualify for green project reserve will be determined after bids are received and the amount of the loan established. At that point, the percentage of this loan that is provided by the ARRA can be applied to the total amount spent on this portion of the project to determine the green project reserve.

REB:DLR
cc: Mr. Don DeGrand, P.E., Water Bureau, Upper Peninsula District