

City of Winterset and Winterset Municipal Utilities Cedar Lake Rehabilitation Project

Winterset is a small city Southwest of Des Moines approximately 20 miles. It is the home to the Bridges of Madison County and the birth place of John Wayne. 54% of its population of 5,129 people are considered low income.

The availability and cost of water has been an issue for the City's small population for several years.

This presentation is intended to brief on the problem Winterset faces, as well as past measures and future options to ensure a continuous and reliable source of water for the City.



Identification of the Problem

- Cedar Lake Dam and Spillway are in critical need of repair
 - Lake constructed in 1939
 - DNR Reports beginning in 1992 have identified significant deterioration
 - Repairs postponed to research alternative sources of water, damages have continually increased
- Missing/damaged floor slabs have exposed earthen subgrade susceptible to erosion and head cutting in the spillway
 - Significant head cutting from floodwaters through the spillway could result in a catastrophic event.
- Winterset's sole source of water
- What was an 80 acre footprint is now <60 due to topsoil runoff
 - Runoff as high as 8,500 lbs./acre/year in the past, now below 1,500
 - Siltation has reduced Lake Capacity by nearly 50%

Proposed Solution

- Dredge Lake to Remove Excess Sediment
 - Lake Capacity expected to nearly double from approx. 235 million gallons to 457 million gallons
 - Ability to serve roughly 13,000 people and accommodate Winterset's growing population
 - Began in mid-2013
- Repair Dam
 - Add toe berm for increased structural integrity – Structural Factor of Safety greater than 1.5 (steady state seepage, non-seismic).
- Reconstruct Spillway
 - Remove existing concrete, rebuild eroded subgrade, replace concrete chute and subdrainage utilizing current standards
- Continued Efforts to Minimize Erosion & Sediment Delivery

Project Alternatives

- Build a new lake
 - Cost \$40 to \$45M, 4 years of research
 - 2 potential locations of 14 overall in Madison County
 - Individual permit required from USACE because of stream mitigation and riffle pools
- Drill wells
 - 2 years of research
 - Several test wells were drilled, water submitted for testing
 - Low water production & maintenance of many wells is cost prohibitive
- Pipeline to Des Moines WaterWorks (DMWW)
 - Cost \$11.6M plus \$1.40 to \$3.50 per 1,000 gallons
 - Feasible per DMWW, not cost effective

Rationale for Choosing Project

- Most cost-effective and economical solution
- Environmentally, ecologically and recreationally preferable
 - No new environmental or ecological impact
 - Recreational resource remains
- Winterset maintains quality water supply at lowest cost

Project Timeline

- Dredging began in mid-2013, to be complete by end of year 2013
 - Costs and cost estimates are coming in lower than originally anticipated
 - Dredging cost is estimated at \$5.5M
- Bids will be requested for spillway and dam repair January / February 2014
- Work will begin 2014
- Project completion 12/31/2014

Maintenance Plan

- DNR Inspections every five years
- Annual inspection of subdrain discharges and concrete deterioration by WMU
- Annual clearing of vegetative growth on the dam
- Continued emphasis on watershed conservation practices to minimize runoff and siltation

Estimated Project Costs

- Dam and Toe Berm - \$524,850
 - Includes Mobilization, Excavation, Clearing & Grubbing, Engineering / Testing and Contingency
- Spillway Replacement – \$3,273,930
 - Includes Mobilization, Removal of Existing Spillway, Excavation and Replacement of Unusable Materials, Engineering / Testing, Contingency and Installation of the following:
 - Cutoff Wall
 - Subdrain
 - 10” Double Reinforced PCC Spillway
 - Sheet Piling
 - PCC Baffle Blocks in Stilling Basin
 - Class ‘B’ Revertment

Flood Mitigation Funding Request

- Total Project Cost - \$3,798,780
- Winterset requests Flood Mitigation Funds to supplement local bonding funds to complete the project.
 - 50% of project costs funded by bonding (\$1,899,890)
 - 50% of project costs funded by Flood Mitigation Fund (\$1,899,890)

Conclusions

- Completion of the project is urgent – any flood event could be catastrophic to the lake, dam, spillway and City of Winterset.
- City of Winterset and WMU respectfully requests that the Board approve the project and funds the Flood Mitigation Fund

On behalf of the City of Winterset, thank you for your time and consideration of this project!