ITEM # _22____
DATE: 03-22-16

COUNCIL ACTION FORM

SUBJECT: SQUAW CREEK WATER MAIN PROTECTION PROJECT (HAZARD MITIGATION GRANT PROGRAM FLOOD MITIGATION)

BACKGROUND:

Following flooding in 2010, Public Works staff submitted 11 projects for consideration under the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP). Nine of the projects were denied federal funding due to failure to achieve a benefit cost analysis greater than 1.0. **On June 26, 2012, City Council directed staff to continue pursuing federal funding for the Stuart Smith Park Bank Stabilization project. This has been named the Squaw Creek Water Main Protection project** by Iowa Homeland Security and Emergency Management Department (HSEMD). Municipal Engineer Tracy Warner was designated as the City's authorized representative for the project, and a local match was approved up to $120,000.

Included in the 2012-2017 Capital Improvements Plan (CIP) was a program entitled Flood Response and Mitigation Projects that included $820,000 in General Obligation Bonds and $325,000 in Storm Sewer Utility Funds. Portions of this funding were used on a flood mitigation project in Northridge Subdivision/Moore Memorial Park and for bank stabilization near Utah Drive and another location near North Riverside. These three projects are now complete. The two remaining projects are the Trail Ridge Landslide and the Squaw Creek Water Main Protection project (this project). Unspent local funding totaling $628,737 has been carried forward through budget amendments.

An engineering consultant was hired to complete the HMGP Drainage Project Application, which was submitted in July 2012. The proposed construction project included sheet pile walls and riprap infill for bank stabilization to protect the existing 24-inch water main under Squaw Creek on the south side of Lincoln Way. In September 2012, the City was notified that this project was considered stacked, which meant that the funding cap was reached by other projects for the specific disaster covering this project. In 2015, staff was notified that FEMA was interested in breaking up the project into phases, which included Phase I that would fund further analysis of the problem and the best proposed solution, including consideration of whether the existing low-head dam should be removed or remain in place as part of the project. City Council approved the Phase I agreement on May 26, 2015, where FEMA funded 75%, the State funded 10%, and the City funded 15% of the cost.

The 2015 Phase I report analyzed this section of Squaw Creek in detail for grade-control weir structure removal considerations and alternatives. Findings showed that **the existing soils are non-cohesive and highly susceptible to erosion**, especially when the bank height exceeds 10 feet. Stream flow in Squaw Creek is highly variable, which particularly affects channel/bank stability. The east bank has developed an extreme potential for erosion due to the resulting 20-foot tall, near vertical bank. The area adjacent to the dam is already eroding at a fast rate toward the City's water distribution system booster station. There is concern that the banks will erode to the point where they expose the water main. Once exposed, the water main would be susceptible to being washed out during a significant storm event.

Stream slopes on Squaw Creek are milder in the lower reach (South Duff Avenue) and upper reach, while steeper in the transition zone between South 4th Street and the Rail Road/6th Street Bridges (this project location). The steeper channel slope in this region results in faster, more powerful flows. In 1965 the USGS built the concrete weir as a hydraulic control for flow measurement and to aid in develop rating curves by having a stable creek section.

While the term "dam" is used in the 2015 Phase I report, this dam is very, very small compared to the common perception of a "dam" or low-head dam without much storage. This structure may better be described as a small step weir, grade control structure with low risk and low maintenance cost. The dam helps protect the Lincoln Way Bridge by supporting stream stability between the dam and the bridge. Bridge contraction of overbank flows increases the risk of bank erosion and scour. Abrupt channel-width expansion and drop of overbank flows on the west side has increased bank erosion and created a high-failure risk. The proposed alternative provides for a gradual transition that improves overbank flow continuity and bank stability while also protecting the existing 24-inch water main.

The original, September 2012 analysis called for sheet piling as the primary means of bank stabilization along with a rock riffle/rapids to mitigate the effects of the dam. **The alternative recommended in the October 2015 report to progress toward Phase II (construction) is based on a stream restoration approach utilizing integrated/bioengineering techniques. Bank stabilization techniques would consist of flattening the banks, construction of benches within the banks, utilization of revetment stone for stabilization at lower elevations (up to the bench), and structural soil (soil filled rock) with native plantings at elevations above the bench. The project would also consist of installing a rock flume (rip rap) downstream of the low head dam to eliminate the eddy pool contributing to the bank erosion.**

Considering the current and future risk to the existing infrastructure, restoring a gradual transition downstream of the dam is recommended. This option is considered the most cost-effective to achieve the objectives and would also improve ecological functions and aquatic habitat, as well as reduce the area disturbed by the project.

Staff received notification on March 2, 2015 that the FEMA grant has been approved for Phase II, which would include final design, permitting, and construction of the alternative described above.

If this agreement is approved, a request for professional services proposals will be requested for Phase II (final design, permitting, and construction). Once proposals are received and rated by City staff for work associated with FEMA and HSEMD's recommended Phase II work tasks, a contract will be brought back to City Council.

ALTERNATIVES:

1. Approve the Grant Agreement with FEMA/Iowa Homeland Security for Phase II of the City of Ames, Squaw Creek Water Main Protection Project. Under this agreement, FEMA and State of Iowa (through Iowa Homeland Security) will pay up to $571,370 (85%) of the Phase II contract, with the City contributing $100,830 (15%).

2. Direct staff to pursue alternative funding sources for this project.

3. Do not proceed with this project at this time.

MANAGER'S RECOMMENDED ACTION:

Through approving this agreement for Phase II, the City will receive federal and state funding to aid in protecting the existing 24-inch water main going under Squaw Creek at Lincoln Way. The local funding match is available from monies previously designated for flood mitigation projects. Delay of approving this agreement could jeopardize receipt of federal and state funding, due to this project being on an extremely tight schedule as directed by FEMA.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1, thereby approving the Grant Agreement with FEMA/Iowa Homeland Security for Phase II of the City of Ames, Squaw Creek Water Main Protection Project.