BEMIDJI CITY COUNCIL

Work Session Agenda

Monday, June 8, 2009

City Hall
Conference Room
5:30 P.M.

1. CALL TO ORDER / ROLL CALL

2. REVIEW OF TYLER ESTATES FLOOD ANALYSIS PHASE I REPORT

3. AJOURNMENT

COUNCIL AGENDA ITEM

Meeting Date: June 8, 2009 Work Session

Action Requested: Tyler Estates Flooding – Phase I Flood Analysis Report

Prepared By: Craig Gray, City Engineer

Reviewed By: John Chattin, City Manager

Background:

Attached is the Tyler Estates Phase I Flood Analysis report that has been prepared by Barr Engineering. This phase one report was authorized by the City Council on April 27. There were two objectives with this report. The first was to provide an analysis of the flooding that occurred this past spring in Tyler Estates and the second was to develop some preliminary information on some long-term flood mitigation alternatives.

Discussion

The first objective of the report was to provide an analysis of the flooding that occurred in March and try to characterize what type of event this was – i.e. was it a 10-year event, 50-year event or 100-year event? The report concludes that, as expected, the flooding was a result of snowmelt and rainfall. The estimated amount of runoff due to snowmelt was determined to be between 3.2 and 3.6 inches. It also rained March 22-25. The amount of rainfall was between 2.49 inches and 3.17 inches. On page 6 the report concludes that the estimated total runoff that occurred between March 15 and March 25 was between 5.7 and 6.8 inches. The average of this is close to a 50-year frequency event, meaning that the chance of the same amount of runoff occurring during any given year is about 2%.

However, that does not mean that a less, or more frequently occurring amount of runoff would not also cause homeowner flooding problems. The actual amount of runoff that would cause flooding issues was not analyzed as part of the limited Phase I study.

The second objective was to estimate possible costs associated with some preliminary mitigation alternatives that would provide Tyler Estates with protection from a 100-year flood event (6.9 inches of runoff). The study looked at five alternatives and provided rough estimates of the costs of each alternative. Each alternative has an associated figure with it in the back of the report. It must be noted that the estimates provided are preliminary and are only appropriate for use on a planning level. In order to provide more accurate information the stormwater model would need to be completed as part of a Phase II study.

A description of each alternative studied is provided below:

Alternative 1 – Pumped Outlet to the North

This alternative would install a pump station in Tyler Estates along with 2,500 feet of force main pipe along Tyler Avenue and Brinkman Drive. A ditch would also be graded to convey flow to the Mississippi River. The existing ponds would also be regarded to provide additional storage. This option is shown on Figure 4 in the back of the report and has an estimated cost of between $1.3 and 2.0 million. A gravity outlet to the north would have similar costs.

Alternative 2 – Gravity Outlet to the West

This option would provide a gravity outlet to Lake Bemidji. This would be accomplished with construction of ditches and earthen berms and associated roadwork. Grotte Avenue and Chippewa Drive would be reconstructed to carry the stormwater to a new culvert that would be installed under Lake Avenue. Additional ditches would be constructed from Lake Avenue to Lake Bemidji. This option would require the acquisition of approximately 17 acres of easements. This option is shown on Figure 5 and has an estimated construction cost between $900,000 and $1.3 million. This cost does not include the cost of acquiring the 17 acres or the necessary permitting that would be required.

Alternative 3 – Provide Upland Storage

This alternative would provide storage for stormwater runoff in upland areas of the watershed, which would then limit the amount of runoff that reaches the low area within Tyler Estates. The runoff volume that would be generated from the 100-year runoff event is 310 acre-feet, which exceeds the approximately 110 acre-feet that are currently provided by the ponds in Tyler Estates. This would require the construction of additional upland ponds resulting in the excavation of roughly 324,000 cubic yards of material. Figure 6 shows some upland areas where this could be accomplished. The estimated cost of this option is between $2.7 and $4.0 million, which does not include the necessary acquisition of 40 acres of land.

Alternative 4 – Construction of a Ring Levee

This option is shown on Figure 7 within the report and would construct a levee around the Tyler Hills development, similar to what was constructed in East Grand Forks after the 1997 Red River Flood. Tyler Avenue would also have to be raised and the existing pond would have to be increased in size and volume. In order to do this two of the homes (3816 and 3908 Valley View Drive) would have to be acquired. The estimated cost is between $1.2 and $1.9 million.

Alternative 5 – Purchase at Risk Homes

This option would purchase and demolish the lowest five homes in the area that are at greatest risk of flooding. Figure 8 shows the five homes. In order to provide protection from the 100-year runoff volume for the remaining homes additional work would be necessary to increase the pond volume and to construct some berms. The estimated cost of this option is about $1.6 - $1.7 million.

Summary

Alternative No.	Description	Estimated Cost	Easements
1	Pumped Outlet to the North	$1.3- $2.0 million	none
2	Gravity Outlet to the West	$900,000 - $1.3 million	17 acres
3	Provide Upland Storage	$2.7 - $4.0 million	40 acres
4	Construction of Ring Levee	$1.2 - $1.9 million	10 acres
5	Purchase at Risk Homes	$1.6- $1.7 million	None

Financing

Based upon current CIP projects and the financial projections of the stormwater fund the city's ability to fund any of these options with current stormwater utility rates is remote.

It may be possible that the cost estimates could go down slightly if the Phase II work is authorized. Through the completion of the stormwater model it may be determined that less runoff than is projected is actually coming, which would reduce the amount of ponding and or piping that would be required. It also possible that a hybrid of the above options could be determined to be feasible with additional study. However, none of the above costs include the purchase of the necessary easements so even the cheapest option is very likely going to reach or exceed $1,000,000 when all costs are considered.

Recommendation:

If the City Council wishes to have the above estimates refined even further they should authorize the completion of Phase II of the drainage study at a cost of $23,500. However, the Council should discuss if they are prepared to proceed with a project whose minimum cost is $1,000,000. If not, Phase II should not be undertaken.