ITEM # <u>22</u> DATE: <u>12-18-12</u>

Staff Report

TEAGARDEN DRAINAGE STUDY

December 18, 2012

The City Council received complaints about storm water flooding that caused property damage along S. Duff Avenue following the rainfall events in August 2010. In response to these complaints, in July 2011 the City Council approved the usage of Storm Sewer funds to complete a drainage study of the watershed that includes the Ames Municipal Airport, as well as Teagarden/Southdale/Emerald Subdivision area. The watershed is divided into three subwatersheds: South Branch, Middle Branch, and North Branch.

In order to complete this project efficiently, the City hired Alfred Benesch & Company (Benesch) to collect data and analyze watershed drainage concerns. On November 17, 2011, City staff hosted a public meeting where we gathered drainage comments from land owners and residents within the watershed. As a result of the meeting, the drainage concerns were able to be categorized into the following types of issues: groundwater, maintenance, and surface drainage that warranted further analysis.

On March 26, 2012, City staff hosted a second project informational meeting to present findings and potential solutions to the drainage concerns brought to our attention. A copy of the presentation slides are attached for reference. In general, a storm water model was developed to analyze the ability to make public improvements that prevent flooding near and over S. Duff Avenue/US Highway 69.

Maintenance Improvements - \$150,000

The drainage concerns categorized as maintenance issues exist primarily along the existing cunette in the residential subdivision east of S Duff Avenue/US Highway 69. Field observations of existing conditions indicate that over time, sediment has built up along the drainage channel, volunteer trees have become overgrown, and erosion is occurring at the end of the cunette. Additionally, a portion of the existing tile that has been part of Drainage District Washington #59 appears to be filled in with sediment and will need to be cleaned out. This is the Drainage District that Story County Supervisors, acting as the Drainage District Trustees, took action to transfer jurisdiction to the City of Ames in spring/summer 2012.

Maintenance of the cunette is included in the draft CIP in year 2013/14 as part of the Low Point Drainage Improvements with an estimated cost of \$150,000 from Storm Sewer Utility Funds.

South Branch Improvements - \$600,000

During the investigation, residents along the east side of S. Duff Avenue/US Highway 69 between Ken Maril Road and Garden Road indicated that the roadway was overtopped with flood waters during one night of the 2010 floods. While this was not able to be confirmed by Police, nor Iowa DOT, the storm water model gives likely indication that this was the case.

As shown on the attached presentation, approximately half of the sub-watershed for the South Branch lies west of the Airport. The runoff from this area then flows through the south portion of the Ames Municipal Airport property before going back onto property located outside of the Ames corporate limits. Immediately west of S. Duff Avenue/US Highway 69, the South Branch flows inside the Ames corporate limits and under the highway into the residential subdivision. The South Branch combines with the Middle Branch north of Garden Road, which then flows into the existing cunette.

In order to prevent overtopping of S. Duff Avenue/US Highway 69 during a 100year flood event, the Teagarden Drainage Study recommends adding a detention basin on Airport property. This basin would need to be approved by FAA and would need to be designed with aviation kept in mind (i.e. height of vegetation, wildlife that may be attracted to the basin). The estimated cost to create a basin is \$300,000.

Another public improvement along the South Branch is to shape and stabilize that portion that exists east of S. Duff Avenue/US Highway 69. This channel has existing in natural form, which is eroded, unstable, and flows out of the stream banks during higher flood events. The estimated cost to stabilize the channel is \$300,000.

Middle Branch Improvements - \$555,000

The Middle Branch is the smallest subwatershed of the three drainage areas analyzed with this report. The drainage area begins east of the Airport runway and includes the property at 3409-3413 S. Duff Avenue, which requested rezoning in summer 2011.

The analysis of this drainage area revealed a need to add a detention basin west of S. Duff Avenue/US Highway 69 to prevent flooding along the roadway. This basin could be combined with the development of 3409-3413 S. Duff Avenue, if an agreement of funding, sizing (if it would also cover the storm water management from the site development), and maintenance can be achieved with the property owner. The estimated cost to create a basin is \$345,000.

In addition to the added detention basin, improvement to the Middle Branch drainage way (both east and west of S. Duff Avenue/US Highway 69) is recommended. When the site at 3505 S. Duff Avenue was developed, the existing channel was decreased in size. This has contributed to the overland flooding in the area. By recreating a defined channel, storm water runoff would be more directed in a natural flowage path. The estimated cost to improve the channel is \$210,000.

North Branch Improvements - \$750,000

The North Branch also begins west of the Airport property. This drainage area already contains three of the four detention basins present on airport property. Commercially developed property along S. Duff Avenue/US Highway 69 (south of Airport Road) and residential development east of S. Duff Avenue/US Highway 69 also flow into the North Branch.

In order to prevent overtopping of S. Duff Avenue/US Highway 69 during a 100year flood event, the Teagarden Drainage Study recommends adding a detention basin in the vicinity of the property located at 3115 S. Duff Avenue. This currently undeveloped property (3115 S. Duff Avenue) could be combined with the development of this property, if an agreement for funding, sizing (if it would also cover the storm water management from the site development), and maintenance can be achieved with the property owner. The estimated cost to create a basin is \$610,000.

In addition to the added detention basin, storm sewer improvements along Jewel Drive from Opal Drive to 500 feet west are recommended. Currently the area from Opal Drive west to S. Duff Avenue/US Highway 69 does not have storm sewer pipe and structures. As part of this study, it is recommended to add storm sewer in the area in order to have pipe conveyance of area runoff to the existing cunette. The estimated cost to construct storm sewer improvements is \$140,000.

Next Steps

Unfortunately, in March 2012 Benesch closed their Ames, Iowa engineering consulting office and City staff is still without a final report as required in their contract. Staff has been working with a former Benesch project engineer, who has since provided the City with estimated costs of the recommended improvements. He has committed to Benesch that he will complete the final report, however no definitive schedule has been provided.

Public improvements recommended from this study will need to be prioritized for inclusion in the CIP. Since portions of the Middle and North Branch improvements involve private property, cost sharing arrangements with land owners/developers will need to be finalized before the City can proceed.

Ames Teagarden Drainage Study

Alfred Benesch & Company | Public Meeting | March 26, 2012





1ST PUBLIC MEETING (11/17/2011)



OVERALL DRAINAGE BASIN



OBSERVATION/FIELD SURVEY



OBSERVATION/FIELD SURVEY



OBSERVATION/FIELD SURVEY



MODELING



EXISTING CONDITIONS



SOUTH BRANCH CONCLUSIONS

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| | South | Branch @ Du | ff Crossing - | Top of Road | = 903.95 |
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| | 5 | 139 | 901.15 | 77 | 899.74 |
| | 10 | 189 | 902.37 | 104 | 900.29 |
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MIDDLE BRANCH CONCLUSIONS

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| 10 | 91 | 901.39 | 38 | 899.70 |
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NORTH BRANCH CONCLUSIONS

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ADDITIONAL CONCLUSIONS



RIVER FLOODING EFFECTS



QUESTIONS?



