

Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 8F. Implications of Atlas 14
BCWMC May 16, 2013 Meeting Agenda
Date: May 8, 2013
Project: 23270051.34 2013

8F. Implications of Atlas 14

Recommendations:

1. For information only.

Background

On April 19, 2013, the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) released new information regarding the magnitude of precipitation depths for different return frequencies (e.g. 100-year 24-hour rainfall depths). This report, Atlas 14, serves as an update to Technical Paper 40 (TP 40), published by NOAA in 1961. The precipitation depths for various return frequencies listed in TP 40 are currently the most widely used values by Twin Cities' municipalities and watershed organizations. The amounts reported in Atlas 14 are based on more precipitation monitoring stations and approximately 50 more years of additional precipitation data than TP 40. Table 1 shows a comparison of the TP40 values and the Atlas 14 values for a sampling of storm events for the Golden Valley station in the Bassett Creek watershed.

Table 1. Comparison of TP40 and Atlas 14 values – Golden Valley station

Storm Event	TP 40, inches	Atlas 14, inches
50% annual probability ("2-year") 24-hour	2.8	2.9
10% annual probability ("10-year") 24-hour	4.2	4.3
1% annual probability ("100-year") 24-hour	6.0	7.4

Figure1 (attached) shows the precipitation monitoring stations in and near BCWMC. Figures 2 – 4 (also attached) show the TP40 and Atlas 14 values for the 2-year, 10-year and 100-year 24 hour events.

The change in values, specifically the 100-year 24-hour storm depth, raises several policy questions for the Commission, the member cities and agencies to consider. As noted in the December 13, 2012 gaps analysis document, member city and BCWMC stormwater management policies reference storm events that may be outdated. As a result, the changes in precipitation values may affect:

- Member city rate controls and other standards
- Stormwater infrastructure design criteria
- BCWMC policies related to the BCWMC Flood Control Project, trunk system, and floodplain management
- Floodplain profiles/delineation (FEMA and BCWMC)

Most of the member cities require no increases in the discharge rates as a result of development. The standards typically reference the return frequency (e.g., the 100-year 24-hour event) rather than the precipitation amount (or possibly both). The Commission and the member cities will need to discuss whether the rate control standards should reflect the Atlas 14 values or the old TP 40 values, or whether the existing “freeboard” requirements provide adequate protection.

The stormwater infrastructure in the watershed has typically been analyzed and designed using the TP40 values. Reevaluating storm sewer systems and flood levels with the new values could show higher flood levels and more homes within 1% probability (“100-year”) flood levels, and could show higher flow rates and undersized stormwater systems. The Commission and the member cities will need to discuss how to handle the design of new systems in light of the Atlas 14 values. This is especially critical in areas where new systems would connect with in-place systems. The Commission and the member cities will also need to discuss whether the in-place systems (ponds, storm sewers, lakes, creeks) should be re-analyzed using the Atlas 14 values.

Barr’s understanding is that FEMA (Federal Emergency Management Agency) and the Minnesota Department of Natural Resources will not be requiring new flooding analyses until the respective FEMA flood insurance rate maps are revisited, which could be decades from now.

Conclusions

The release of the Atlas 14 final values will result in changes to rainfall depths in the watershed. The Commission and the member cities will need to start considering how they should respond to this change. Although no action is needed by the Commission at this moment, this suite of issues will be discussed in more detail as part of the planning process for the Next Generation Plan.

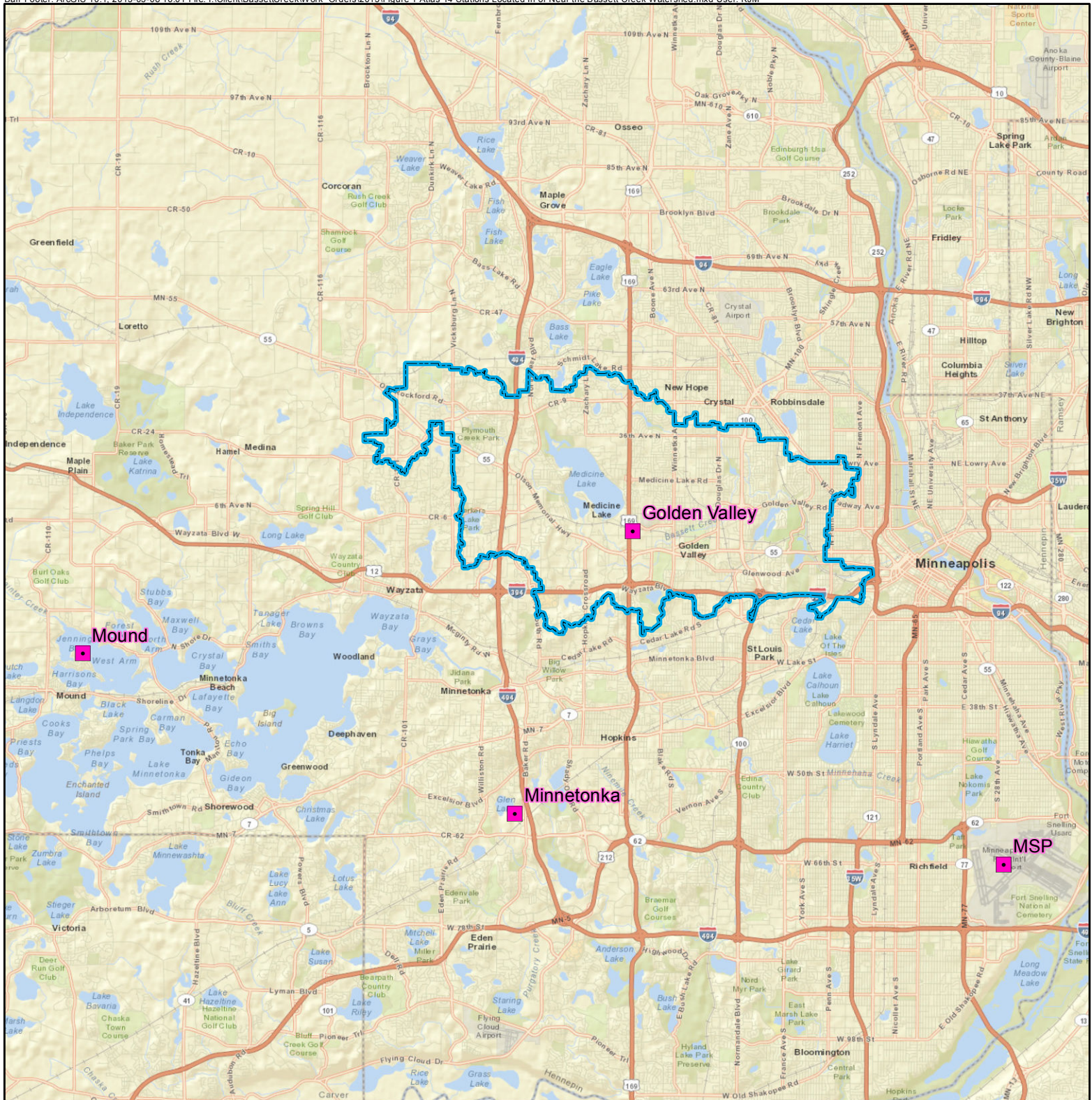
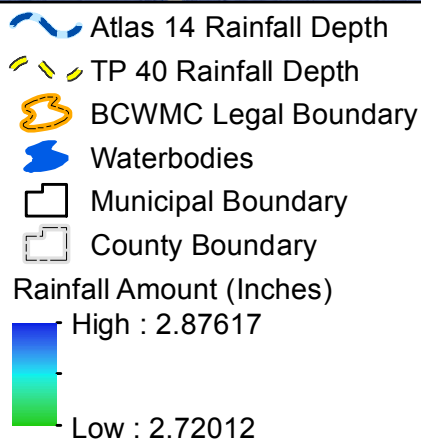


Figure 1

ATLAS 14 STATIONS LOCATED IN OR NEAR
THE BASSETT CREEK WATERSHED
MANAGEMENT COMMISSION

2-YEAR, 24-HOUR EVENT
Atlas 14 Precipitation
Frequency Estimates
Bassett Creek Watershed
Management Commission



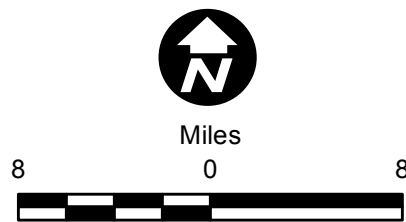
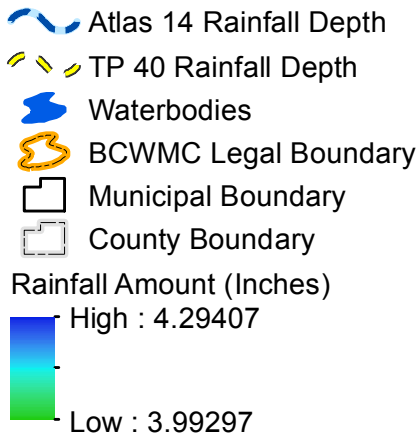
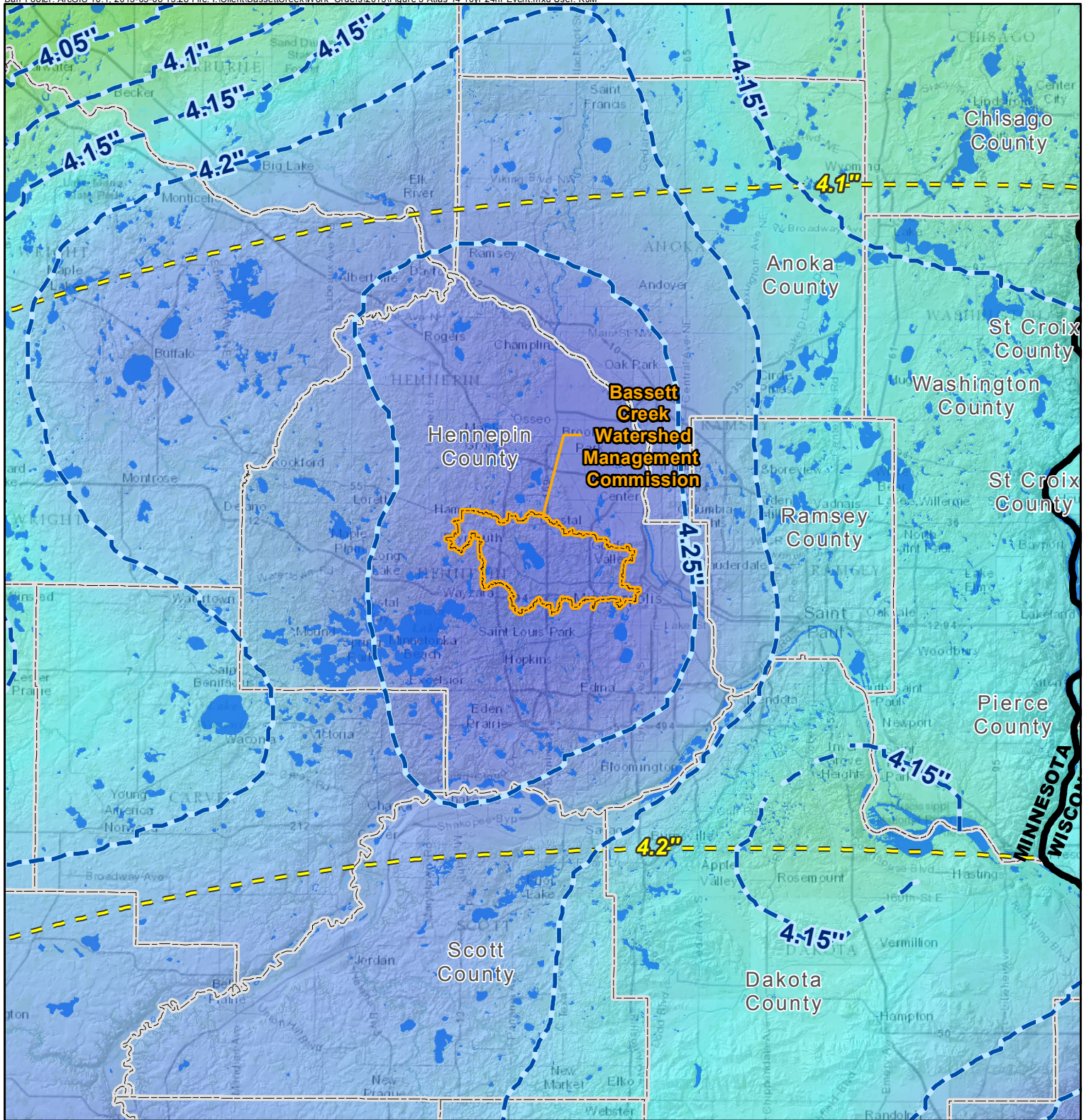


Figure 3

10-YEAR, 24-HOUR EVENT
 Atlas 14 Precipitation
 Frequency Estimates
 Bassett Creek Watershed
 Management Commission

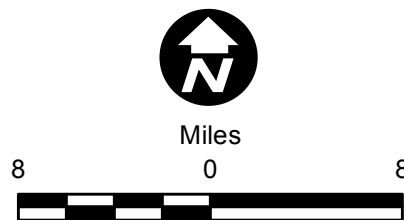
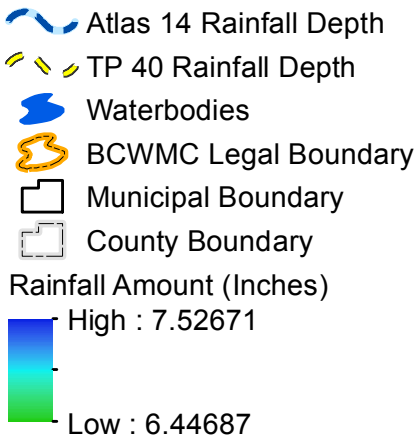
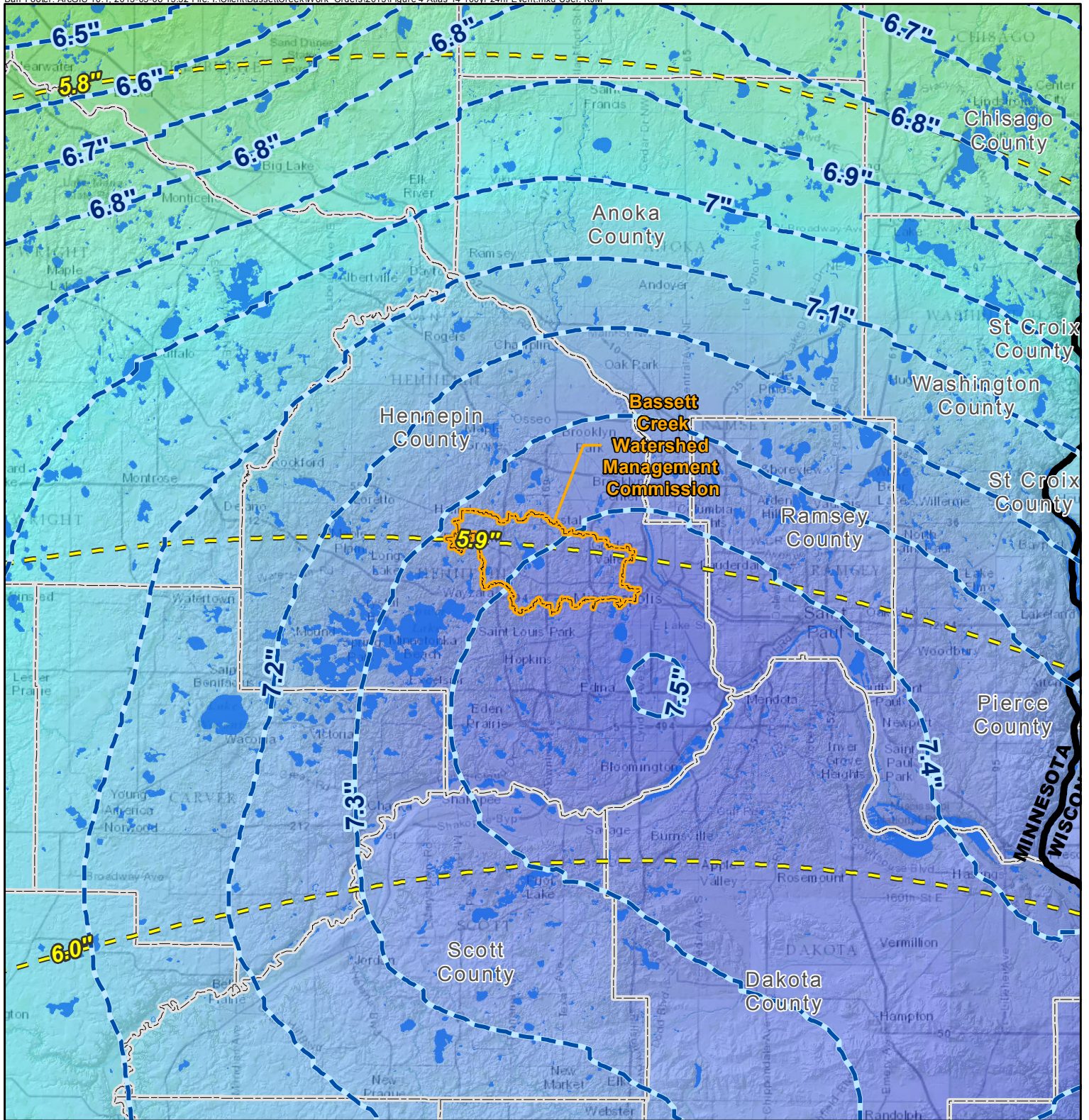


Figure 4

100-YEAR, 24-HOUR EVENT
 Atlas 14 Precipitation
 Frequency Estimates
 Bassett Creek Watershed
 Management Commission