TECHNICAL MEMO

To: Todd Pedersen, P.E.

From: Mac Compton, P.E.

Date: April 2, 2020

Re: West Memphis Design Storm

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15396
MAXWELL L. COMPTON

INTRODUCTION

This draft technical memo is to provide justification for design storm event to eliminate capacity related SSOs and to minimize peak flow to WRF.

BACKGROUND

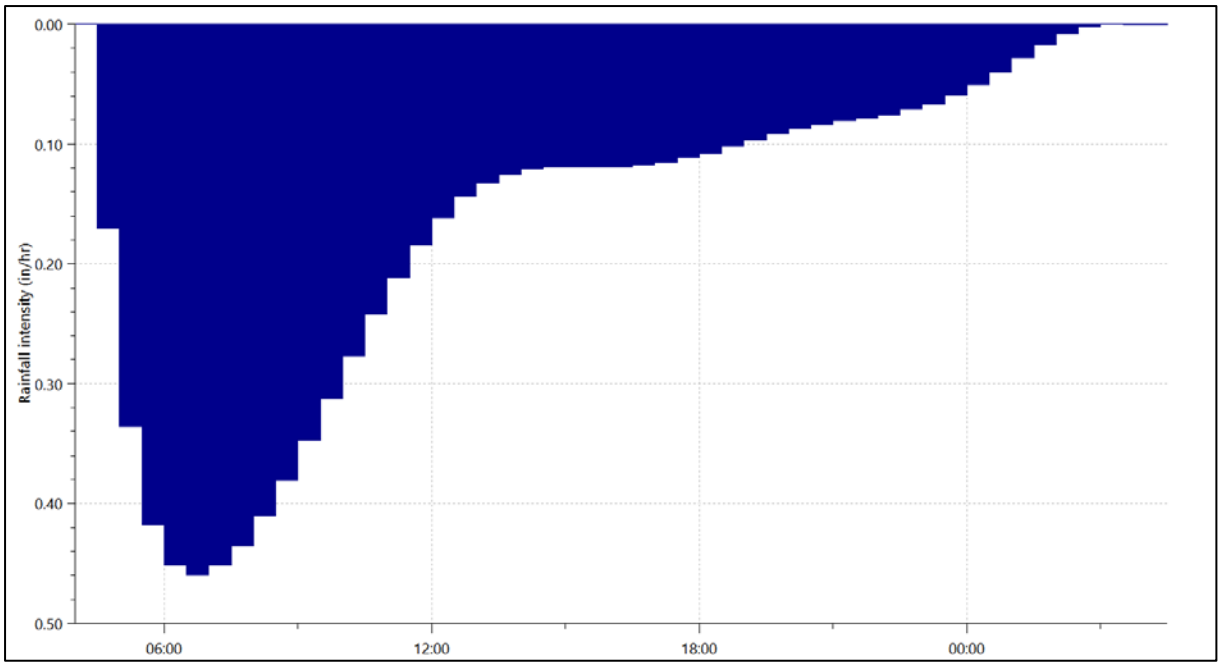
The West Memphis sewerage system serves the City of West Memphis, located within Crittenden County, along the eastern border of Arkansas and directly across the Mississippi River from Memphis, Tennessee.

The system contains over 149 miles of gravity sewer main, 45 lift stations, 21.6 miles of force main and serves a population of approximately 24,000 people. The system is operated and maintained by West Memphis Utility Commission (WMUC). Flow from West Memphis is collected and treated in a facility towards the south of the town, adjacent to the Mississippi River.

DESIGN STORM

RJN's recommended design storm is a 2-year 24-hour storm. The design storm has a peak intensity of approximately 0.5 inches/hour and a total rainfall depth of 3.87 inches. Figure 1 shows the design storm hyetograph.

Figure 1: 1 in 2yr 24hr Design Storm



DESIGN STORM JUSTIFICATION

The 2-year 24-hour design storm was applied to a calibrated hydraulic model of the sewer collection system to identify areas with insufficient capacity and overflows. The design storm is used as a model because this type of storm typically stresses the system and can be used to design future improvements. The usage of this storm is consistent with the design storms selected by other major cities in Arkansas in the development of their System Evaluation and Capacity Assurance Plans.

Additionally, a 2-year 24-hour storm event is recommended for best management practices. Due to the proximity to the Mississippi River, with a high-water table and the relatively flat topography, the City of West Memphis's storm water system can be overwhelmed by any large storm event. Large storm events that cause flooding in the City will allow significant surface water to enter the sanitary sewer system, requiring conveyance and treatment at WRF.

To meet West Memphis Utilities' CAO, RJN recommends designing and constructing all necessary improvements to the 2-year 24-hour storm event along WMUC's continued rehabilitation efforts to reduce Inflow and Infiltration (I/I) in the current system. This will regulate the amount of flood waters entering the sanitary sewer system during larger storm events without the expense of building larger conveyance infrastructure and cost to treat surface water.