Arkansas Department of Health

ADH Engineering Section

WASTEWATER UTILITY HYDRAULIC DESIGN GUIDELINES

The 2014 Edition of Recommended Standards for Wastewater Facilities shall be used for determining the hydraulic design basis for wastewater collection and treatment facility projects submitted for review by the Arkansas Department of Health – Engineering Section. These standards are generally required and accepted in most States and commonly referred to as Ten States Standards (TSS) and available at the following website: www.health.state.mn.us/communities/environment/water/tenstates.

TSS 11.24 - Hydraulic Capacity

1. Design flows for wastewater facilities associated with new wastewater collection systems shall be sized based on an average daily flow of 100 gallons per capita plus wastewater flow from industrial plants and major institutional and commercial facilities unless water use data or other justification upon which to better estimate flow is provided.

    a. The 100 GPCD value shall be used with a peaking factor from Figure 1 (typically 2.0 – 4.2) to cover normal infiltration for systems built with modern construction techniques (TSS 31 – Design of Sewers). However, an additional allowance should be made where conditions are unfavorable. (The 100 GPCD design value is based on numerous studies that documented indoor water usage at approximately 65 GPCD and an added 35 GPCD allowance for I & I. Metcalf & Eddy design criteria also reference indoor water usage of 65 GPCD).

2. Design flows for wastewater facilities associated with existing collection systems shall be made using actual flow data to the extent possible.
    a. Actual flow data shall be evaluated for accuracy and include applicable wet weather inflow and infiltration flows and projected growth flows for the design life of the facilities per TSS 11.2 – Facility Plans. (See criteria on next page)
    b. In the absence of actual flow data, the design flows shall be based on criteria for new collection systems.

3. Preliminary project submittal is recommended and may be required for projects that are very large, have significant or system-wide hydraulic impacts, or propose to significantly deviate from TSS design criteria.

CRITERIA FOR THE USE OF CURRENT WASTEWATER FLOW DATA FOR DESIGNING FACILITIES

1. At least 12 continuous months of continuous flow data (Section 11.241 a.), preferable 24 or more continuous months of continuous flow data. (continuous flow data means data collected at 15 minute or more frequent intervals).
2. Continuous flow data shall be collected from critical locations in the wastewater system. (Known limited capacity points, major junctions in the collection system, influent to lift/pump stations, and influent to flow equalization and treatment facilities)
3. To ensure acceptance and applicability of the flow data, the proposed monitoring plan should be reviewed with this office prior to collection of data to be included in the design report.
4. Documentation on the accuracy / precision / and verification of the flow measurement data collection shall be provided.
5. The latest census data for the applicable wastewater service area should be used for determining the per capita flow rates.
6. Documentation of rainfall events during the study period shall be provided. The online NOAA Precipitation Frequency Data Server is a source of this data.
7. The wastewater system needs to handle a 5-year frequency rainfall event without surcharging or overflowing (5-year reoccurrence 24 rainfall with 2-year reoccurrence 60-minute peak rainfall). If there is not a 5-year frequency rainfall event included in the recorded flow data, the impact of a 5-year frequency rainfall event shall be modeled based on the impact of larger storm events captured in the flow data.
8. Documentation of aggregate customers and their total water usage. Not the exact water usage by each individual user.
    a. For each 6-month period document:
        i. The overall number of active water meters in the sewer service area that contribute flow to the sewer collection system. Exclude meters with no usage or such low usage that it is unlikely that the residence was occupied. Also exclude meters such as sprinkler meters that do not contribute to the wastewater flow.
        ii. The residential water usage.
        iii. The commercial / industrial water usage.
        iv. The population served.
        v. For commercial and industrial customers, use local knowledge and best engineering judgement to determine if the population should be added, partially added, or if it is already included in the residential population.

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