Sewer Capacity Analysis
MCSD Sewer Collection System

Analysis Summary

For the purposes of the 20-year facility planning process for the McKinleyville Community Services District (MCSD) wastewater management facility (WWMF), a preliminary model of the sanitary sewer collection system was developed. Now, this information is being used to determine the development potential in McKinleyville based on areas that can be supported by the existing collection system. This model was updated in 2013 to include recent, verified as-built conditions that were not previously reflected in the geographic information system (GIS) data used for the base layer information in the model.

The MCSD sewer capacity analysis focused primarily on the review of the available capacity in the three main gravity transmission lines that convey wastewater from the east side of Highway 101 to the WWMF located west of Highway 101. The amount of available capacity in a sewer system will vary based on the storm event selected for the rainfall-derived infiltration and inflow (RDII) [1] analysis. Currently California has not specified a design storm interval for use in RDII analyses. Therefore, three different design-storm return intervals were used for the McKinleyville sewer system analysis, the 5-year, 25-year, and 100-year design storms.

Under a 5-year RDII scenario, the available capacity in the three main transmission lines, in terms of equivalent dwelling units (EDUs), is approximately 2,500 new units total, with capacity available in all three main transmission lines. For the 25-year RDII scenario, the available capacity is limited to approximately 780 new units, and the capacity is only available in the middle and southern main transmission lines. The northern main line is limited by the firm capacity of the downstream pump station under the 25-year RDII scenario. The 100-year RDII scenario shows no available capacity in the system at any of the main transmission lines.

In the absence of regulatory guidance, the 25-year storm event can be considered suitable for planning purposes, because it provides a balance between the higher-risk 5-year RDII estimates and the more conservative 100-year RDII estimates. Limiting capacity based on the 25-year RDII analysis enables the MCSD to reserve capacity for flows in excess of the 5-year RDII in the system, while allowing for some additional development to occur in McKinleyville under existing conditions.

1 RDII is the term used to define a sewer's response to rainfall. RDII represents the additional flow in a sewer above the normal dry-weather base sanitary flow due to wet-weather storm events.