

Project Number

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Decision Support System for Selection of Satellite vs. Regional Treatment for Reuse

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Objectives

The purpose of the Decision Support System (DSS) tool is to provide a broadly applicable, standardized approach to evaluating satellite wastewater reclamation systems as an alternative to traditional regional wastewater reclamation facilities. The DSS is intended to support water, wastewater, or regional planning agencies in the United States in preliminary planning activities as an aid to the decision-making process where new treatment and distribution infrastructure is being considered for water reuse. It is intended for simplified formulation and evaluation of alternative reclamation systems.

Results/Findings

The potential scenarios that could be encountered in evaluating the relative merits of a satellite reclamation system versus a regional system are practically endless. In order to develop a functional DSS that applies engineering analysis to defined treatment and conveyance options within a limited budget, it was necessary to restrict the potential variations to a manageable number by making several assumptions:

- The reuse infrastructure evaluated by the tool will be new equipment and facilities.
- Wastewater to be reclaimed is predominantly municipal
- The satellite treatment plant will be located near a sewer interceptor, and residuals can be returned to the interceptor for downstream processing at a regional facility.
- If a regional wastewater treatment facility is expanding its hydraulic capacity, the expansion will include a new treatment train to produce the new increment of reclaimed water.
- If an existing regional wastewater treatment facility does not need expansion, additional treatment of effluent will be necessary to produce the new increment of reclaimed water.

The DSS was designed to address relatively small systems. The average daily flow into the new satellite treatment plant or the new treatment processes at the regional plant ranges from 0.5 to 20 million gallons per day (MGD). The DSS addresses two types of reuse: direct reuse and indirect reuse via groundwater recharge. No distinction is made between different types of direct reuse (e.g. open access irrigation vs. industrial cooling) or different techniques for recharge (groundwater spreading vs. aquifer injection).

Reuse water quality criteria are based on the most stringent Arizona (class A+) and California Title 22 (disinfected tertiary) criteria. In utilizing broad categories of reuse and selecting these sets of water quality criteria, an attempt was made to balance the desire for broad applicability with the need to restrict the sets of criteria used to size and estimate costs for treatment processes.