



Memorandum

*To: South Carolina Department of Natural Resources (DNR)
South Carolina Department of Health and Environmental Control (DHEC)*

From: CDM Smith

Date: June 3, 2015

Subject: Water User Demands in Baseline SWAM Models

Baseline SWAM models will be developed for each river basin with the intention of representing current demands and operations applied over an extended period of hydrology. In other words, a repeating sequence of demands may be applied in the model over an extended period with variable hydrology. These models will be used to simulate “status quo” conditions subject to variable water availability. They will also serve as the starting point for simulations of future conditions, which might include demand change projections, permit changes, or new water supply alternatives. The baseline models will differ from the “calibration” models which include historical usage patterns and are intended to provide a hind cast simulation.

Current demands for baseline municipal and industrial (M&I) water users in SWAM will be quantified using a combination of recent withdrawal records and information provided by individual utilities. Each M&I user will be reviewed on a case by case basis to estimate current usage patterns. Withdrawal records will be analyzed to identify patterns with respect to changes with time throughout the reporting period. Based on this analysis, a representative period will be selected (e.g. the past 5 to 10 years) and annual water use will be averaged over that selected recent period. Average consumptive use (and thus discharge amounts) and average monthly distribution patterns will also be calculated for the same period. For more static conditions, this averaging period will be longer; for more dynamic usage patterns with clear trends, the averaging period will be shorter. In support of this quantitative approach, information provided by the utilities themselves with respect to current water demands will be considered and incorporated. As needed, differences between the reported withdrawal values and reported current demands will be reconciled using best engineering judgement.

Current demands for agricultural (Ag) water users in SWAM will be set based on a combination of reported withdrawal data and CDM Smith agricultural demands modeling. For Ag water users, compared to M&I users, the link between water demands and hydrology/climate is stronger. A closer look at the full extended period of water usage records is therefore warranted. It may be that the coupling between Ag demands and specific hydrologic years outweighs any changes in Ag

demands associated with changes in irrigated acreage, land use, or operations (e.g. irrigation efficiencies). In such a case, it may be best to represent current Ag demands using the full suite of historical data in order to maintain the coupling with the time-variable hydrology of the model. The CDM Smith agricultural demand model may be used to support this analysis and help identify appropriate current Ag demands.