



Technical Memorandum

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

From: CDM Smith

Date: May 2, 2016

*Subject: Unimpaired Flow Development
Santee River Basin, South Carolina*

1.0 Background and Objectives for Unimpaired Flows

Unimpaired Flow (UIF) describes the natural hydrology of a river basin. UIFs quantify streamflows throughout a river basin in the absence of human intervention in the river channel, such as storage, withdrawals, discharges, and return flows. From this basis, modeling and decision making can be compared with pristine conditions.

This memorandum identifies the active and inactive flow gages the Santee River basin and provides recommendations on where UIF development may occur.

2.0 Overview of the Santee Basin USGS Gages

Eighteen United States Geological Survey (USGS) gaging stations monitor streamflow in the Santee River Basin. Of these, only eight are not located in tidally influenced areas, including three on the Santee River, one on the Cooper River, two on tributary streams, and two on diversion canals. Only four of the non-tidally influenced gages are currently active.

An overview map of the USGS streamflow gages in the Santee River Basin are shown in **Figure 1**. **Figure 2** depicts the length and timing of records available for the non-tidally influenced USGS gages in the Santee River basin.

3.0 Recommendations for UIF Development

The eight non-tidally influenced USGS gages are candidates for UIF development. A detailed explanation for each of these gages is listed below:

SAN01 (USGS 0217000): This gage has been inactive since 1941, since the construction of Lake Marion. Its original location now places it in the middle of Lake Marion, six miles upstream of the current dam. UIF development at this gage is not recommended since it is now within Lake Marion. However, the hydrologic patterns of SAN01 can still serve as validation tools for the SAN02 UIFs for comparing seasonal fluctuation, annual average flow, and low flow statistics.

SAN02 (USGS 02171500): This active gage (1941-2015) is located just downstream of Lake Marion dam on the Santee River. This is the replacement gage to SAN01, becoming active the year SAN01 became inactive. Although the unimpairment of Lake Marion and its multiple diversion canals may be complex, SAN02 is a candidate for UIF development. SAN02 is recommended as the primary gage for this basin's period of record.

SAN03 (USGS 02171645): This gage is located on the rediversion canal from Lake Moultrie to the Santee River. UIF development is not recommended since it does not reflect a location where natural (unimpaired) flow once occurred.

SAN04 (USGS 02171650): This inactive gage (1966-1982) is located on the Santee River downstream of a confluence with the rediversion canal from Lake Moultrie. This gage is a candidate for UIF development.

SAN05 (USGS 02171580): This inactive gage (1966-1992) is located on Wedboo Creek, tributary to the Santee River. This gage is a candidate for UIF development.

SAN06 (USGS 02170500): This gage is located on the diversion canal from Lake Marion to Lake Moultrie. UIF development is not recommended since it does not reflect a location where natural (unimpaired) flow once occurred.

SAN07 (USGS 02172002): This gage is located on the Cooper River just below the outlet from Lake Moultrie. Unimpairment of this gage requires removing the effects of Lake Moultrie and the input of flow from Lake Marion. This gage is a candidate for UIF development.

SAN08 (USGS 02172035): This gage is maintained and used by the Francis Marion National Forest parks service. This gage is a candidate for UIF development.

4.0 Summary

Five of the eight USGS gaging stations are candidates for UIF development. The three exceptions are SAN01, which is currently inundated, and the two diversion canals, SAN03 and SAN06. Although SAN01 is not a candidate for UIF development, its original record will still be used to check patterns in the UIF for SAN02. UIF development is not recommended for gages located on diversion canals since they do not reflect a location where natural (unimpaired) flow once occurred.