Water Balance Development, Hydrogeologic Characterization, and Selenium Flux Assessment, Newport Bay Watershed

Orange County, California

Client
Orange County Department of Public Works

Highlights
♦ Develop comprehensive water balance of former swamp area
♦ Characterize selenium occurrence and speciation
♦ Evaluate potential sources of selenium
♦ Identify data gaps in water balance and selenium characterization
♦ Engaged project stakeholders throughout project

DBS&A was awarded a contract with the Orange County Department of Public Works, Watersheds Section (OC Watersheds) to develop a hydrogeologic characterization, water balance, and selenium transport evaluation in an area known as the former “Swamp of the Frogs,” in the cities of Tustin, Irvine, and Santa Ana. OC Watershed’s goal is to better understand and ultimately control selenium and nitrogen occurrence and transport within the watershed so it can be reduced to meet U.S. EPA’s Total Maximum Daily Load (TMDL) requirements for local surface water channels.

The former swamp area was historically a depositional environment receiving regional stream flow and surface water runoff. A network of surface water channels was established to lower the water table and capture storm flow. These surface water channels are now located below the regional groundwater table and receive high-selenium groundwater throughout much of the former swamp area.

DBS&A has worked with OC Watersheds, RWQCB, and local stakeholders to perform the following tasks:
♦ Develop a comprehensive water balance of the former swamp area
♦ Characterize selenium occurrence and speciation in groundwater, surface water, and passive groundwater seeps to surface water channels
♦ Evaluate potential sources of selenium and loading to groundwater and surface water channels
♦ Identify data gaps in water balance and selenium characterization and outline further studies to fill data gaps and move forward with TMDL compliance

Peters Canyon Wash is located in the former Swamp of the Frogs area in present-day Tustin, California. DBS&A has led a project demonstrating that selenium-rich groundwater discharge into the surface water channels is driven by regional groundwater recharge in upgradient areas of the watershed.