## Aquatic Mercury Assessment of the Savannah River Site

Dennis G. Jackson, Nancy V. Halverson, Michael H. Paller, and Brian B. Looney
Savannah River National Laboratory, Aiken, South Carolina, USA

An aquatic mercury assessment of the Savannah River Site (SRS), an 800 $km^2$ facility along the Savannah River in South Carolina, was performed to evaluate mercury flux to the surrounding ecosystem. The study produced a diverse dataset collected over three years, investigating: 1) mercury concentration and speciation in industrial discharges, streams, and river; and 2) precipitation concentration/atmospheric deposition.

Mercury inputs totaled approximately 17.3 kg/yr and consisted of: influent from an offsite stream (0.1 kg/yr), mercury added by SRS operations via the NPDES outfalls (0.2 kg/yr), and atmospheric deposition (10 kg/yr wet and 7 kg/yr estimated dry). Mercury outputs consisted primarily of effluents via multiple site streams (1.1 kg/yr). Assuming an approximate mass balance, the sum of the mercury storage and re-volatilization within the SRS boundary was approximately 16.2 kg/yr. Thus, greater than 90% of the mercury input is being retained in the soil, sediments, water bodies and vegetation, and/or is being reemitted to the atmosphere. Mercury released through the SRS outfalls was equivalent to approximately 1% of the total atmospheric deposition on the SRS, indicating that atmospheric deposition is the major source of mercury to the SRS environment. These findings are similar to many other studies (Lindberg et al. 2002, Ericksen and Gustin 2004, Ericksen et al. 2002, Hintelmann et al 2002, Landis and Keeler 2002), which found that, for a variety of settings, a significant fraction of mercury is atmospherically deposited and that these mercury inputs are often bound to soil and vegetation. In general, the baseline mercury characterization documented that SRS is a typical coastal plain site and that mercury entering the site's water sheds and ecosystems is subject to transport and transformation processes that are analogous to other sites in the southeast.

Lead Author/Presenter:
Dennis G. Jackson
Savannah River National Laboratory
Building 773-42A, Room 210
Aiken, SC, USA

Voice: 803.725.1468
Fax: 803.725.7673
dennis.jackson@srnl.doe.gov