

Hydrogeology of a rapid infiltration basin system

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The Delaware Geological Survey has released a new technical report titled "Hydrogeology of a Rapid Infiltration Basin System at Cape Henlopen State Park, Delaware."

The report was prepared by A. Scott Andres and Changming He of the Delaware Geological Survey, Edward Walther of the South Water Management District in Florida and Müserref Türkmen of the Izmir Water and Sewerage Administration in Turkey, and DGS Bulletin 21B documents the results of a detailed study of [groundwater](#) and hydrogeology at a rapid infiltration basin system (RIBS).

DGS Bulletin 21B is the second of four reports that evaluate RIBS, which are one of several land-based wastewater disposal methods used in Delaware. The study was prompted by concerns that RIBS may pose a threat to groundwater quality that would cause problems with the quality of [water](#) in our aquifers and in bodies of surface water.

Other study components and reports evaluate performance of [wastewater treatment plants](#) that discharge effluent to RIBS, groundwater quality impacts of RIBS, and the use of simulation techniques to predict hydraulic and water quality impacts of RIBS.

This study conducted detailed hydraulic and hydrogeologic evaluations of the soils, sediments and groundwater at the Cape Henlopen State Park RIBS to document where and how fast treated wastewater infiltrates to the water table and flows away from the RIBS.

The work found that the sediments beneath the RIBS rapidly transmit effluent to the water table and that the warm temperature of the effluent is an effective tracer of wastewater movement.

Evaluation of the temperature data showed that groundwater flow was oriented at a different direction than would be predicted by interpretation of land-surface topography, which should caution those that design or regulate RIBS and monitoring systems to use data collected under operating conditions to assess RIBS impacts on groundwater.

Monitoring systems designed with land-surface topography may not provide necessary early warning of impacts of RIBS on groundwater.

Disposal of inadequately treated wastewater through RIBS presents a risk for Delaware's hydrogeologic setting, as many previous studies have documented that the shallow Columbia aquifer is especially vulnerable to contamination by nitrate from wastewater disposal. The Columbia aquifer is an important source of potable water and is the source of water for fair-weather streamflow.

The report fulfills part of the DGS's mission to understand hydrologic systems and to advise, inform and educate Delawareans about the results of such investigations for use in such topics as water supply and pollution, agriculture, public health, economic development, land-use planning, geologic hazards, environmental protection, energy and mineral resources, emergency management and recreation.

Bulletin 21B is available in PDF format from the [DGS website](#) under the Publications tab.

Provided by University of Delaware

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