



**EXPLANATION**

This map shows the locations of wells and test holes from which hydrogeologic data were obtained for this report. Wells in the U.S. Geological Survey (USGS) National Water Information System (NWIS) database or in the New York State Department of Environmental Conservation (NYSDEC) Water Well Program database are identified by a county well number, issued by the NYSDEC on behalf of the USGS, preceded by a county prefix ("Du" for wells in Dutchess County). Monitoring wells, geoprobe borings, test holes, and inventoried wells for which information was provided by consultants are also identified by a county well number, but are differentiated using separate map symbols. Many of these test holes and monitoring wells were installed as part of investigations, funded by the U.S. Environmental Protection Agency (USEPA), of two Federal Superfund sites. Well use, whether domestic, public supply, or industrial/commercial is not differentiated by type, and all wells used for withdrawal are shown with the same well symbol, regardless of use type. The aquifer boundary, defined as the boundary between stratified drift and relatively impermeable till or bedrock, is shown as a heavy blue line.

— Aquifer boundary—Indicates contact between unconsolidated deposits that comprise the Sprout Creek-Fishkill Creek aquifer and adjacent deposits of fill or bedrock.

— Limit of mapped area—Indicates arbitrary truncation of mapped area.

● Test boring—Geoprobe test being conducted by Camp Dresser McKee for the Hopewell Precision USEPA Superfund investigation.

● Well—from New York State Department of Environmental Conservation Water Well Program well database.

● Well—inventoried by Lockheed Martin Corporation as part of the Hopewell Precision USEPA Superfund investigation.

● Well—from U.S. Geological Survey (USGS) National Water Information System (NWIS) database.

● Well—Bedrock monitoring well installed by Groundwater Sciences Corporation as part of the Shenandoah Road USEPA Superfund site investigation. Geophysical logging conducted by the USGS.

● Well—Monitoring well installed by Camp Dresser McKee for the Hopewell Precision U.S. Environmental Protection Agency (USEPA) Superfund investigation.

**Abstract**

The hydrogeology of the stratified-drift aquifer in the Sprout Creek and Fishkill Creek valleys in southern Dutchess County, New York, previously investigated by the U.S. Geological Survey (USGS) in 1982, was updated through the use of new well data made available through the New York State Department of Environmental Conservation's Water Well Program. Additional well data related to U.S. Environmental Protection Agency (USEPA) remedial investigations of two groundwater contamination sites near the villages of Hopewell Junction and Shenandoah, New York, were also used in this study. The boundary of the stratified-drift aquifer described in a previous USGS report was extended slightly eastward and southward to include adjacent tributary valleys and the USEPA groundwater contamination site at Shenandoah, New York. The updated report consists of maps showing well locations, surficial geology, altitude of the water table, and saturated thickness of the aquifer. Geographic information system coverages of these four maps were created as part of the update process.

**Introduction**

Dutchess County, New York, is currently (2009) experiencing rapid development and, consequently, the county's water needs are growing. Much of Dutchess County, particularly the southwestern part, contains many productive valley-fill (outwash sand and gravel) aquifers that are underlain by fractured carbonate bedrock. This combination results in comparatively large yields for both sand and gravel and bedrock wells. The high permeability of the outwash and the fractured nature of the carbonate bedrock, have fostered the growth of long plumes of contaminated groundwater in some areas. Currently, the U.S. Environmental Protection Agency (USEPA) is conducting site investigations of two groundwater contamination sites within the Sprout Creek-Fishkill Creek watershed. At both of these sites, hundreds of private wells are contaminated by volatile organic compounds, chiefly trichloroethylene (TCE) and perchloroethylene (PCE). The U.S. Geological Survey (USGS) has provided assistance to USEPA at these two Dutchess County sites.

The USEPA investigations are site-specific and limited in scope; however, both studies (CDM Federal Programs Corporation, 2008; Groundwater Sciences Corporation, 2002) have provided valuable hydrogeologic data from the drilling of monitoring wells.

One of the primary purposes of the USGS's Detailed Aquifer Mapping Program in New York is to provide basic hydrogeologic information on the State's aquifers to Federal, State, and local agencies charged with managing and protecting New York's groundwater resources. This information is particularly important in areas of New York that are undergoing rapid development, with a resultant increase in usage of both municipal and self-supplied groundwater. The USGS has conducted two previous appraisals of aquifers in Dutchess County. The first was an appraisal of the groundwater resources in the Fishkill-Beacon area (Snarely, 1980), the second (Moore and others, 1982) was one of the first aquifer-mapping assessments carried out under the original USGS Detailed Aquifer Mapping Program, in cooperation with the New York State Department of Health (NYSDOH). This second report (Moore and others, 1982) assesses the hydrogeology of the surficial aquifer in a 35-square-mile area within the Sprout Creek and Fishkill Creek valleys. At the time these studies were done, however, relatively few well data were available that could be used to define the hydrogeologic framework of the valley-fill aquifers in some areas; specifically, data were insufficient to define the thickness of the aquifer in the northern half of the mapped area (Moore and others, 1982, sheet 4). Since then, new domestic well data have become available, the logs of which were obtained through the New York State Department of Environmental Conservation (NYSDEC) Water Well Program ([www.dec.ny.gov/lands/4997.html](http://www.dec.ny.gov/lands/4997.html)). In addition, the two USEPA investigations previously mentioned have provided some additional monitoring-well data available to the USGS for this update.

**Purpose and Scope**

This report presents updated hydrogeologic maps of the Sprout and Fishkill Creek valleys in southern Dutchess County, New York. The maps show (1) the location of wells and test holes, (2) the surficial geology, (3) the altitude of the water table, and (4) the saturated thickness of the surficial sand and gravel aquifer. This report updates a previously published USGS report (Moore and others, 1982) and shows wells, water-table altitudes, and saturated thicknesses in areas where data was insufficient in 1982.

**Methods**

New well data obtained through the NYSDEC Water Well Program was used primarily to create the well-location map and to update the saturated-thickness map published by Moore and others (1982). In addition, monitoring-well logs and water-level data from remedial investigations of groundwater-contamination sites at Hopewell Junction and Shenandoah, NY, were used to update the Moore and others (1982) water-table and saturated-thickness maps. The surficial geology in the expanded portion of the mapped area was compiled from available field maps (Connally, 1980; Gerber, 1982), published reports (Connally and Sirkis, 1986), and digital soils mapping from the Soils Survey Geographic Database (SSURGO) maintained by the Natural Resources Conservation Service (NRCS). The soils units in the SSURGO data set for the study area were assigned a parent-material code based on the soil-unit descriptions, which were, in turn, plotted as an overlay to the USGS 1:24,000-scale topographic base map. The soil unit boundaries were then adjusted slightly to correspond with topographic and geomorphic features to produce surficial geologic units in previously unmapped parts of the study area. The water-table map was constructed primarily using topographic stream control, and was supplemented with water-level data in areas where data from wells were available. The previously published saturated-thickness map (Moore and others, 1982) was expanded into the northern valleys and the southeastern part of the drainage area, primarily through the use of well logs and reported water levels. As part of this update, geographic information system (GIS) coverages were created for each map in this report, using geographic information system software, and are available through the USGS member inventory page on the New York State GIS Clearinghouse Web page (<http://www.nysgis.state.ny.us>).

**Locations of Wells and Test Holes**

This map shows the location of wells and test holes used to update the previous USGS study of this area (Moore and others, 1982). Well data were compiled from various sources, including the USGS National Water Information System (NWIS) database, which contains well data from the previous studies of this area (Simmons and others, 1961; Snarely, 1980; Moore and others, 1982), as well as an unpublished compilation of well records conducted by the USGS for Dutchess County (D. S. Luma, U.S. Geological Survey, written commun., 1990). More recent well data were provided by the NYSDEC through its Water Well Driller Program, by which drillers' logs and construction details of all drilled wells in New York State are required to be submitted to the NYSDEC. Monitoring-well and geoprobe records for two USEPA Superfund studies were provided by two consulting firms—Camp Dresser McKee (CDM) for the Hopewell Precision Superfund site near Hopewell Junction, and Groundwater Sciences Corporation for wells drilled near the Shenandoah Road Superfund site near Shenandoah, NY. In addition, the results of an inventory of domestic wells affected by contamination in the Hopewell Precision Superfund site were provided by Lockheed Martin Corporation. These groups of well data are shown on sheet 1 in different colors to denote their respective sources. In addition, two inset maps—one for the Hopewell Precision Superfund site and the other for the Shenandoah Road Superfund site—are included on sheet 1 to show the closely spaced wells more clearly.

