GROUND-WATER LEVELS IN SOUTH CAROLINA, 2006–2010

STATE OF SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

LAND, WATER AND CONSERVATION DIVISION



WATER RESOURCES REPORT 50 2012

GROUND-WATER LEVELS IN SOUTH CAROLINA, 2006–2010

by

Scott V. Harder, Constance E. Gawne, Joseph A. Gellici, and Andrew Wachob

STATE OF SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES



LAND, WATER AND CONSERVATION DIVISION WATER RESOURCES REPORT 50

2012

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PLATE

Map showing locations of DNR observation wells, 2006–2010

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by

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ABSTRACT

Ground-water levels measured from 109 wells in South Carolina from 2006 through 2010 are statistically analyzed, tabulated, and presented as hydrographs. Five wells are located in the Blue Ridge Province, 13 in the Piedmont, and 91 in the Coastal Plain. Water levels in 63 of the wells were measured hourly with automated data recorders; most of the remaining wells were measured on a bimonthly schedule using hand-held electric measuring tapes. All of the wells are maintained by the South Carolina Department of Natural Resources for water-resource assessments.

Water levels fluctuated from 1 to 27 feet over the five-year period. Many wells had water levels that were at all-time lows owing to drought conditions that persisted for several years. Most lows occurred during late summer and early fall of 2007 and 2008. Water levels in the Middendorf aquifer near Florence rose by about 12 feet over the last five years, as the city continues to supplement its ground-water supplies with surface water. Long-term downward trends are observed in the Middendorf aquifer in Allendale, Aiken, Barnwell, and Lexington Counties, and in the Lake City area of Florence County. Downward trends are also observed in the Black Creek and Tertiary sand aquifers in Allendale and Barnwell Counties. Water levels in the Floridan aquifer near Edisto Beach are declining.

INTRODUCTION

The South Carolina Department of Natural Resources (DNR) routinely collects ground-water level data for water-resource assessments and for management and planning purposes. These data are used to identify short- and long-term changes in ground-water levels and storage due to changes in withdrawals, recharge rates, and climatic conditions; to calibrate ground-water flow models; and to determine regional hydraulic gradients and ground-water flow rates and directions of the major aguifers. The base ground-water monitoring network currently includes 57 monitoring sites and 109 wells. Water levels of 63 wells are measured hourly with automated data recorders (ADRs); the remaining wells are measured periodically, typically on a bimonthly basis, using an electric measuring tape. Most monitoring wells have been measured since the mid-to-late 1990s, although a number of wells existed before then, one dating back to 1955. Well locations, county well numbers, and the aquifers that are being measured are shown on the Plate. Table 1 lists the wells by county and includes county well numbers, DNR grid numbers, and aquifer names.

PREVIOUS WATER-DATA REPORTS

This is the third in a series of reports documenting ground-water level data collected from the DNR monitoring network. Harwell and others (2004) documents water-level data collected from 56 wells during the period from 2000 through 2001. Specific conductance data from two wells in Charleston and Colleton Counties are included in that report. Agerton and others (2007) contains water-level

data collected from 69 wells during the period from 2000 through 2005. Specific conductance data from one well at Edisto Island are also reported. Other ground-water level compilations include intermittent and periodic water-level measurements of 16 Piedmont province wells and 266 Coastal Plain province wells by Waters (2003). That report represents 282 hydrographs and is the most extensive compilation of historical South Carolina ground-water level data to date. Hydrograph records range from 6 to 50 years, and about one-third of the record sets span periods greater than 20 years. Gellici and others (2004) published selected ground-water data illustrating the effects of the 1998–2002 drought.

DNR also publishes a potentiometric map series for the major Coastal Plain aquifers. Potentiometric levels for the Middendorf aquifer in 1996, 2001, and 2004 were presented by Hockensmith and Waters (1998), Hockensmith (2003a), and Hockensmith (2008a), respectively. Potentiometric levels for the Black Creek aquifer in 1995, 2001, and 2004 were presented by Hockensmith (1997), Hockensmith (2003b), and Hockensmith (2008b), respectively. Seasonal potentiometric maps for the Floridan aquifer for the period 1991–1993 are documented in Gawne (1994), and Floridan aquifer levels for 1998 and 2004 were published by Hockensmith (2001) and Hockensmith (2009), respectively.

WELL-NUMBERING SYSTEMS

Wells are identified by a county well number and also by a location-grid number. The county well number consists of a county-name abbreviation and a sequential number that is assigned by the DNR in coordination with the

Table 1. South Carolina Department of Natural Resources observation wells, 2006–2010

| County | Well number | Grid number | Well location | Aquifer | Page |
|-----------|----------------|----------------|---|------------------|------|
| Aiken | AIK-0817 | 40V-s2 | New Ellenton, 4 miles WSW (County Road 146) | Middendorf | 62 |
| Aiken | AIK-0818 | 40V-s3 | New Ellenton, 4 miles WSW (County Road 146) | Middendorf | 63 |
| Aiken | AIK-0824 | 40V-s5 | New Ellenton, 4 miles WSW (County Road 146) | Black Creek | 92 |
| Aiken | AIK-0825 | 40V-s6 | New Ellenton, 4 miles WSW (County Road 146) | Black Creek | 93 |
| Aiken | AIK-0826 | 36U-o1 | Windsor, 4 miles NNE (Aiken State Park) | Middendorf | 64 |
| Aiken | AIK-0845 | 36U-o2 | Windsor, 4 miles NNE (Aiken State Park) | Middendorf | 65 |
| Aiken | AIK-0846 | 36U-o3 | Windsor, 4 miles NNE (Aiken State Park) | Black Creek | 94 |
| Aiken | AIK-0847 | 36U-o4 | Windsor, 4 miles NNE (Aiken State Park) | Black Creek | 95 |
| Aiken | AIK-0848 | 36U-o5 | Windsor, 4 miles NNE (Aiken State Park) | Black Creek | 96 |
| Aiken | AIK-0849 | 36U-06 | Windsor, 4 miles NNE (Aiken State Park) | Black Creek | 97 |
| Aiken | AIK-0902 | 40W-q1 | Jackson, 1 mile NW (S.C. Highway 125) | Middendorf | 66 |
| Aiken | AIK-2378 | 40W-q2 | Jackson, 1 mile NW (S.C. Highway 125) | Black Creek | 98 |
| Aiken | AIK-2379 | 40W-q3 | Jackson, 1 mile NW (S.C. Highway 125) | Black Creek | 99 |
| Aiken | AIK-2380 | 40W-q4 | Jackson, 1 mile NW (S.C. Highway 125) | Middendorf | 67 |
| Allendale | ALL-0347 | 35AA-q2 | Allendale, 3.5 miles W (County Road 52) | Middendorf | 68 |
| Allendale | ALL-0348 | 35AA-q3 | Allendale, 3.5 miles W (County Road 52) | Cape Fear | 58 |
| Allendale | ALL-0358 | 37Z-t3 | Millet, 3 miles NE (County Road 24) | Middendorf | 69 |
| Allendale | ALL-0363 | 37Z-t4 | Millet, 3 miles NE (County Road 24) | Floridan | 128 |
| Allendale | ALL-0364 | 37Z-t5 | Millet, 3 miles NE (County Road 24) | Floridan | 129 |
| Allendale | ALL-0365 | 37Z-t6 | Millet, 3 miles NE (County Road 24) | Tertiary sand | 116 |
| Allendale | ALL-0366 | 37Z-t7 | Millet, 3 miles NE (County Road 24) | Tertiary sand | 117 |
| Allendale | ALL-0367 | 37Z-t8 | Millet, 3 miles NE (County Road 24) | Black Creek | 100 |
| Allendale | ALL-0368 | 37Z-t9 | Millet, 3 miles NE (County Road 24) | Black Creek | 101 |
| Allendale | ALL-0369 | 37Z-t10 | Millet, 3 miles NE (County Road 24) | Black Creek | 102 |
| Allendale | ALL-0370 | 37Z-t11 | Millet, 3 miles NE (County Road 24) | Middendorf | 70 |
| Allendale | ALL-0371 | 35AA-q4 | Allendale, 3.5 miles W (County Road 52) | Floridan | 130 |
| Allendale | ALL-0372 | 35AA-q5 | Allendale, 3.5 miles W (County Road 52) | Floridan | 131 |
| Allendale | ALL-0373 | 35AA-q6 | Allendale, 3.5 miles W (County Road 52) | Floridan | 132 |
| Allendale | ALL-0375 | 35AA-q8 | Allendale, 3.5 miles W (County Road 52) | Tertiary sand | 118 |
| Allendale | ALL-0376 | 35AA-q9 | Allendale, 3.5 miles W (County Road 52) | Black Creek | 103 |
| Allendale | ALL-0377 | 35AA-q10 | Allendale, 3.5 miles W (County Road 52) | Middendorf | 71 |
| Anderson | AND-0326 | 48H-n2 | Williamston (city water treatment plant) | Crystalline rock | 36 |
| Barnwell | BRN-0349 | 34Y-x1 | Barnwell, 4 miles SE (S.C. Highway 300) | Middendorf | 72 |
| Barnwell | BRN-0350 | 34Y-x2 | Barnwell, 4 miles SE (S.C. Highway 300) | Floridan | 133 |
| Barnwell | BRN-0351 | 34Y-x3 | Barnwell, 4 miles SE (S.C. Highway 300) | Floridan | 134 |
| Barnwell | BRN-0352 | 34Y-x4 | Barnwell, 4 miles SE (S.C. Highway 300) | Tertiary sand | 119 |
| Barnwell | BRN-0353 | 34Y-x5 | Barnwell, 4 miles SE (S.C. Highway 300) | Black Creek | 104 |
| Barnwell | BRN-0354 | 34Y-x6 | Barnwell, 4 miles SE (S.C. Highway 300) | Tertiary sand | 120 |
| Barnwell | BRN-0355 | 34Y-x7 | Barnwell, 4 miles SE (S.C. Highway 300) | Black Creek | 105 |
| Barnwell | BRN-0356 | 34Y-x8 | Barnwell, 4 miles SE (S.C. Highway 300) | Middendorf | 73 |
| Barnwell | BRN-0358 | 35X-e2 | Williston, 3.5 miles S | Middendorf | 74 |

Table 1. South Carolina Department of Natural Resources observation wells, 2006–2010 (continued)

| County | Well number | Grid number | Well location | Aquifer | Page |
|--------------|----------------|----------------|--|------------------|------|
| Barnwell | BRN-0359 | 35X-e3 | Williston, 3.5 miles S | Tertiary sand | 121 |
| Barnwell | BRN-0360 | 35X-e4 | Williston, 3.5 miles S | Tertiary sand | 122 |
| Barnwell | BRN-0365 | 35X-e5 | Williston, 3.5 miles S | Black Creek | 106 |
| Barnwell | BRN-0366 | 35X-e6 | Williston, 3.5 miles S | Middendorf | 75 |
| Barnwell | BRN-0367 | 35X-e7 | Williston, 3.5 miles S | Tertiary sand | 123 |
| Barnwell | BRN-0368 | 35X-e8 | Williston, 3.5 miles S | Black Creek | 107 |
| Beaufort | BFT-0101 | 27KK-y1 | Hilton Head Island (U.S. Highway 278) | Floridan | 135 |
| Beaufort | BFT-0429 | 28JJ-y1 | Bluffton, 2 miles NE | Floridan | 136 |
| Beaufort | BFT-1809 | 27JJ-q2 | Hilton Head Island (Hilton Head Plantation) | Floridan | 137 |
| Beaufort | BFT-1813 | 27KK-j5 | Hilton Head Island (Port Royal Plantation) | Floridan | 138 |
| Beaufort | BFT-1814 | 27KK-j6 | Hilton Head Island (Port Royal Plantation) | Floridan | 139 |
| Beaufort | BFT-1820 | 27KK-o10 | Hilton Head Island (Indigo Run Plantation) | Floridan | 140 |
| Beaufort | BFT-1822 | 27KK-o11 | Hilton Head Island (Indigo Run Plantation) | Floridan | 141 |
| Beaufort | BFT-1845 | 28JJ-p5 | Bluffton, 2.5 miles NE (Waddell Center) | Floridan | 142 |
| Beaufort | BFT-1846 | 28JJ-p6 | Bluffton, 2.5 miles NE (Waddell Center) | Floridan | 143 |
| Beaufort | BFT-2055 | 27KK-r14 | Hilton Head Island (near Singleton Beach) | Middendorf | 76 |
| Berkeley | BRK-0644 | 18W-b2 | St. Stephen (St. Stephen Middle School) | Floridan | 144 |
| Charleston | CHN-0044 | 19DD-o1 | Charleston (USDA site, U.S. Highway 17) | Floridan | 145 |
| Charleston | CHN-0484 | 22GG-d1 | Edisto Beach, 5 miles N (Blue House Plantation) | Floridan | 146 |
| Charleston | CHN-0803 | 11Z-b1 | McClellanville, 7 miles NE (Santee Coastal Res.) | Floridan | 147 |
| Cherokee | CRK-0074 | 36B-b16 | Blacksburg | Crystalline rock | 37 |
| Chesterfield | CTF-0081 | 17H-f1 | Cheraw, 2.5 miles S (Cheraw State Park) | Crystalline rock | 38 |
| Colleton | COL-0016 | 26CC-f1 | Walterboro (Moore Street) | Floridan | 148 |
| Colleton | COL-0030 | 27CC-j1 | Walterboro (Kline Street) | Black Creek | 108 |
| Colleton | COL-0097 | 26AA-k1 | Walterboro, 10 miles S (S.C. Highway 61) | Floridan | 149 |
| Colleton | COL-0301 | 22GG-w4 | Edisto Beach (Edisto Beach State Park) | Floridan | 150 |
| Darlington | DAR-0228 | 17J-m1 | Society Hill, 3 miles SSW (Lake Darpo) | Middendorf | 77 |
| Dillon | DIL-0121 | 10L-b1 | Dillon, 6.5 miles SE (Little Pee Dee State Park) | Middendorf | 78 |
| Florence | FLO-0128 | 13M-p3 | Florence, 9.5 miles E (E.I. DuPont de Nemours) | Middendorf | 79 |
| Florence | FLO-0274 | 16Q-s1 | Lake City (Lake City Airport) | Middendorf | 80 |
| Florence | FLO-0276 | 16Q-s2 | Lake City (Lake City Airport) | Black Creek | 109 |
| Greenville | GRV-0712 | 50B-r1 | Marietta, 8 miles NW (Ceasars Head State Park) | Crystalline rock | 39 |
| Greenville | GRV-2162 | 46E-a2 | Greer (East Riverside Park) | Crystalline rock | 40 |
| Greenville | GRV-2230 | 48D-v2 | Travelers Rest, 1.5 miles S (Furman University) | Shallow | 52 |
| Greenville | GRV-2543 | 49B-o2 | Marietta, 7 miles NNW (Jones Gap State Park) | Crystalline rock | 41 |
| Greenville | GRV-3333 | 48B-d3 | Marietta, 7.5 miles N | Crystalline rock | 42 |
| Greenville | GRV-3335 | 49B-o4 | Marietta, 7 miles NNW (Jones Gap State Park) | Crystalline rock | 43 |
| Greenville | GRV-3336 | 49B-o5 | Marietta, 7 miles NNW (Jones Gap State Park) | Shallow | 53 |
| Greenville | GRV-3341 | 45B-d1 | Landrum, 1.5 miles WSW | Shallow | 54 |
| Greenville | GRV-3342 | 45B-d2 | Landrum, 1.5 miles WSW | Crystalline rock | 44 |
| Greenville | GRV-3533 | 48D-v9 | Travelers Rest, 1.5 miles S (Furman University) | Crystalline rock | 45 |

Table 1. South Carolina Department of Natural Resources observation wells, 2006–2010 (continued)

| County | Well number | Grid number | Well location | Aquifer | Page |
|------------|----------------|----------------|---|------------------|------|
| Hampton | HAM-0050 | 33EE-v1 | Furman (U.S. Highway 601) | Tertiary sand | 124 |
| Hampton | HAM-0083 | 29EE-s1 | Yemassee | Floridan | 151 |
| Horry | HOR-0290 | 6S-v2 | Myrtle Beach (Blizzard Street & Deville Street) | Black Creek | 110 |
| Horry | HOR-0309 | 6R-r1 | Conway, 2 miles SE (U.S. Highway 501) | Black Creek | 111 |
| Horry | HOR-0973 | 5S-f1 | Myrtle Beach (surface water treatment plant) | Middendorf | 81 |
| Jasper | JAS-0425 | 30FF-o1 | Ridgeland, 9 miles NNW (U.S. Highway 278) | Floridan | 152 |
| Jasper | JAS-0426 | 30FF-o2 | Ridgeland, 9 miles NNW (U.S. Highway 278) | Middendorf | 82 |
| Jasper | JAS-0492 | 30FF-o3 | Ridgeland, 9 miles NNW (U.S. Highway 278) | Floridan | 153 |
| Kershaw | KER-0263 | 24I-i1 | Bethune, 10.5 miles NW (Mt. Pisgah Elem. Sch.) | Crystalline rock | 46 |
| Laurens | LRN-1705 | 43J-c2 | Laurens (Joe R. Adair Outdoor Education Center) | Shallow | 55 |
| Laurens | LRN-1706 | 44I-b1 | Gray Court, 2 miles S (former fire tower site) | Crystalline rock | 47 |
| Laurens | LRN-1707 | 43K-k1 | Mountville, 1 mile NW (former fire tower site) | Crystalline rock | 48 |
| Lee | LEE-0075 | 21M-k1 | Bishopville, 3.5 miles ESE (Lee State Park) | Middendorf | 83 |
| Lexington | LEX-0844 | 32S-b4 | Swansea (Swansea High Sch. Freshman Acad.) | Middendorf | 84 |
| Marion | MRN-0077 | 10Q-p1 | Brittons Neck, 3 miles S (former fire tower site) | Black Creek | 112 |
| Marion | MRN-0078 | 10Q-p2 | Brittons Neck, 3 miles S (former fire tower site) | Cape Fear | 59 |
| Marlboro | MLB-0112 | 15H-12 | Bennettsville (Marlboro Co. Rec. Dept. building) | Middendorf | 85 |
| Orangeburg | ORG-0393 | 29U-v1 | Orangeburg (Clark Middle School) | Black Creek | 113 |
| Orangeburg | ORG-0430 | 29U-v2 | Orangeburg (Clark Middle School) | Tertiary sand | 125 |
| Orangeburg | ORG-0431 | 29U-v3 | Orangeburg (Clark Middle School) | Floridan | 154 |
| Richland | RIC-0543 | 27Q-m1 | Eastover (Webber Elementary School) | Middendorf | 86 |
| Richland | RIC-0585 | 29P-t4 | Columbia, 6 miles ESE (Horrel Hill Elem Sch.) | Middendorf | 87 |
| Saluda | SAL-0069 | 39N-u3 | Saluda, 7.5 miles NE (Hollywood Elem. Sch.) | Crystalline rock | 49 |
| Sumter | SUM-0355 | 23О-у3 | Dalzell (Ebenezer Elementary School) | Shallow | 56 |
| Sumter | SUM-0488 | 24Q-11 | Sumter, 3.5 miles SW (Manchester State Forest) | Middendorf | 88 |
| Sumter | SUM-0492 | 19P-q3 | Olanta, 2.5 miles WNW (Woods Bay State Park) | Middendorf | 89 |
| Sumter | SUM-0497 | 24Q-12 | Sumter, 3.5 miles SW (Manchester State Forest) | Black Creek | 114 |

USGS. For example, HAM-0050 represents the fiftieth well inventoried by the DNR in Hampton County.

The DNR also assigns a South Carolina Grid System number to each inventoried well, based on the latitude and longitude of the well. Each major grid division corresponds to 5 minutes of latitude and 5 minutes of longitude. The longitude is signified by a number (e.g., 33) and the latitude is signified by one or two upper-case letters (e.g., EE). To further define the well location, each 5-minute grid is divided into twenty-five 1-minute latitude-longitude grids, which are represented using the lower-case letters a through y. Within a 1-minute grid, wells are numbered sequentially as they are inventoried. Thus, HAM-0050, which is located in southwestern Hampton County, has grid number 33EE-v1 (Fig. 1).

DATA COLLECTION

Ground-water level data are presented in feet above or below land surface. Measurements and sensor settings are made relative to a specified measurement point, and the methods used generally follow those of U.S. Geological Survey (USGS) Stand Alone Procedure Documents (Table 2). Most of the land-surface and measuring-point

elevations were surveyed from USGS or South Carolina Geodetic Survey benchmarks and are reported to the nearest tenth or hundredth of a foot using the National Geodetic Vertical Datum of 1929 (NGVD29). Elevations at the remaining sites were taken from USGS topographic maps and estimated to the nearest foot, and are considered accurate to one-half the map contour interval. Well locations were determined with the Global Positioning System (GPS) using the North American Datum of 1983 (NAD83).

Manual Measurements

Tape measurements typically are made with electric tapes, which are capable of an accuracy of 0.01 ft (feet). However, visibility, thermal expansion and contraction, and tape sinuosity diminish measurement accuracy in field conditions, and accuracies, therefore, are assumed to be no better than 0.05 ft in practice. Less accuracy is likely where depth to water is greater than 100 ft.

Flowing artesian wells are manually measured with 0–30, 0–60, or 0–100 psi (pounds per square inch) range Bourdon-type test gages. The gages are calibrated bi-annually by a commercial testing laboratory and are rated

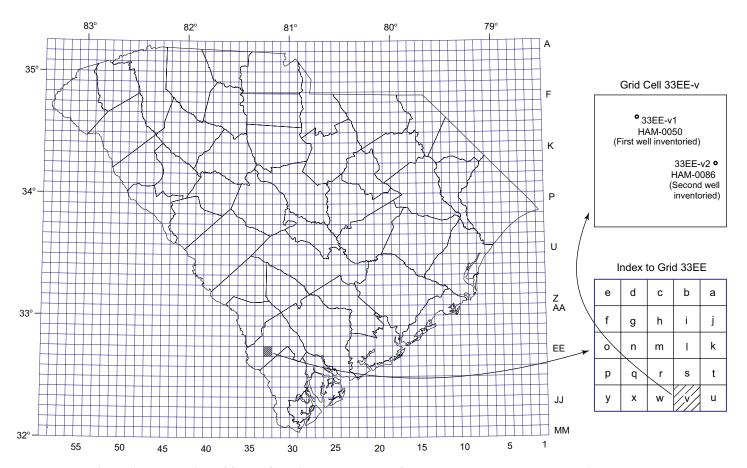


Figure 1. Illustration of South Carolina Department of Natural Resources well-numbering system.

Table 2. USGS Stand Alone Documents applied to the DNR monitoring program

| Document number | Title |
|-----------------|--|
| GWPD-1 | Water-level measurement using graduated steel tape |
| GWPD-3 | Establishing a permanent measuring point |
| GWPD-4 | Water-level measurement using an electric tape |
| GWPD-5 | Locating a well |
| GWPD-12 | Water-level measurement in a flowing well |

to 0.25 percent of their respective measurement ranges. In practice, accuracy will be diminished by errors from gage-zero adjustment, parallax, readings near the extremes of gage range, and mechanical degradation subsequent to calibration. Table 3 summarizes the manufacturer-rated accuracies and the authors' assumptions for measurement.

Automated Measurements

Water-level sensors used for automated monitoring stations include shaft encoders and pressure transducers whose readings are calibrated to manual measurements. Shaft encoders measure depth to water and consist of a pulley that is optically read or that controls a potentiometer, and a cable, float, and counterweight assembly. They have a rated accuracy and resolution of 0.01 ft. The sensor reading is set in reference to a manual tape measurement; however, well plumb, casing joints, and cable disturbances can affect subsequent readings. Measurements within 0.10 ft of a concurrent manual measurement are accepted, along with the corresponding records. The records are excluded if successive sensor and manual measurements differ by more than 0.10 ft and if there is no clear means to adjust the record for cable slip, float snags, or other error.

Pressure transducers measure the height of water above a semiconductor strain gage: electrical resistance to an input voltage and, therefore, voltage output changes as varying water pressure deforms the crystalline lattice of the gage's silicon diaphragm (piezoresistive effect). There is a near-linear correlation between the sensor's pressure range and output-voltage range, and water depth is computed from the voltage measurement. Historically, the transducers used by DNR had pressure ranges from 0–16 ft (0–5 meters) or from 0–33 ft (0–10 meters), and had accuracies and resolutions of 1 percent and 0.1 per-

cent of full scale, respectively. The sums of the transducer measurement (depth above probe) and corresponding taped measurement (depth to water) recorded at each site visit have been compared to determine transducer performance. Where the sum of measurements was found to differ by 0.2 ft from previous measurements, a potential instrument fault may have existed, but no record correction was applied. Where the specifications were exceeded repeatedly, either instruments were recalibrated or instrument failure was confirmed. If failure was confirmed, the transducer was replaced and the associated records were excluded from the hydrograph.

Over the last five years most of these instruments have been replaced with new transducers that have a pressure range from 0-66 ft (0-20 meters) and accuracies and resolutions of less than 0.07 ft and 0.01 ft, respectively. These transducers are not vented to the atmosphere and hence require barometric compensation to determine water level. Hourly barometric data are collected at strategic sites for correction purposes (see Plate). Where the sums of the barometrically compensated transducer measurement and the corresponding taped measurement recorded at each site (tapedown) are greater than 0.20 ft, a potential instrument fault may exist. Where this specification is exceeded repeatedly, instrument failure is confirmed and the transducer is replaced. A few replacement transducers along the coast have a pressure range of 0-692 ft (0-210 meters), are vented to the atmosphere, and have accuracies and resolutions of 0.70 ft and 0.03 ft, respectively. These transducers are replaced if the sum of the transducer measurement and the tapedown are consistently greater than 0.75 ft. Where the specifications were exceeded repeatedly, either instruments were recalibrated or instrument failure was confirmed. Traducers are replaced and records are purged from the database if instrument failure is confirmed.

Table 3. Ranges and accuracies of 0.25-percent precision test gages used by DNR

| Gage range (psi) | Rated gage accuracy (psi) | Rated gage accuracy (ft) | Measurement accuracy (ft) |
|------------------|---------------------------|--------------------------|---------------------------|
| 0 - 30 | 0.075 | 0.17 | 0.4 |
| 0 - 60 | 0.150 | 0.34 | 0.5 |
| 0 - 100 | 0.250 | 0.57 | 0.8 |

Data Storage and Quality

Logged measurements are stored in both raw-data and processed-data tables. The raw-data table contains uncorrected hourly measurements and reflects the readings and the performance of various sensors as they were originally stored in data loggers. Raw data are stored mainly "as is" and are archived at DNR for insight into hardware conditions and for quality assurance. Processed-data tables are corrected for barometric pressure, where appropriate, and are winnowed of measurement anomalies and hardware failures. The winnowed data principally consist of spikes caused by lightning or electromagnetic interference, and of measurements characteristic of hardware faults.

STATISTICAL DATA

Statistics are presented for each well equipped with an ADR and include a graph of the average-daily water level (in feet below land surface) recorded over the fiveyear period from 2006 through 2010, and a corresponding table of monthly and yearly minimums (highest water levels), maximums (lowest water levels), and means (Appendices A-G). Average daily water level is calculated and plotted for each day having 17 or more hourly measurements. Monthly minimums, maximums, and means are calculated for each month having 14 or fewer days of missing record, and the yearly statistics include the minimum, maximum, and mean water level for each calendar year having 10 or more months of record. No statistics are calculated for wells that are manually measured owing to the relatively small number of data values available for such wells. Data presented in this report and data from previous years are available on the DNR website at http:// www.dnr.sc.gov/water/hydro/groundwater/index.html.

HYDROGEOLOGIC FRAMEWORK

The hydrogeologic framework used in this report is that of Aucott and others (1987). Aucott divided the Coastal Plain sedimentary sequence into six aquifers, which in ascending order are: Cape Fear, Middendorf, Black Creek, Tertiary sand, Floridan, and surficial (described below). In 1995, Aadland and others presented a detailed hydrogeologic characterization of the Coastal Plain sequence at the Savannah River Site (SRS) and surrounding area that resulted in a revised hydrogeologic framework and a new hydrostratigraphic nomenclature for west-central South Carolina (Aadland and others, 1995). Aquifers and confining units were named after local geographic features near type-well localities and the previous aguifer names, which were based on geologic formations, were abandoned at SRS. This revised framework and new nomenclature were extended across the rest of the Coastal Plain in the report Groundwater Availability in the Atlantic Coastal Plain of North and South Carolina (Campbell and Coes, 2010) in a chapter entitled Hydrogeologic Framework of the Atlantic Coastal Plain, North and South Carolina (Gellici and Lautier, 2010). For this report, the names and framework of Aucott and others (1987) continue to be used, but wells are also assigned to aquifers using the new framework and nomenclature described by Gellici and Lautier. A comparison chart between the two nomenclatures is provided in Figure 2.

TRENDS IN WATER LEVELS

Ground-water levels observed from 2006 through 2010 include the effects of a statewide drought that began in the spring of 2007 and continued into the spring of 2009. Precipitation was below normal over most of the State, but conditions were most severe in the western part of the State and in the Upstate. Southern regions of the State, such as Beaufort and Jasper Counties, were less affected but were also in and out of drought during this period. Ground-water levels across the State were generally at their lowest during September–December of 2007 and 2008. Many wells had record low water levels. Water levels began to recover in 2009 and were near pre-drought levels by the middle of 2010. Water levels, however, began to drop again toward the end of 2010 as drought conditions returned.

Crystalline-Rock Aquifer

The crystalline-rock aquifer consists of intrusive-igneous and metamorphic rock that transmits ground water through fractures and faults. It is exposed or thinly covered in the Piedmont and Blue Ridge physiographic provinces, where it is the principal source of ground water. It also extends beneath the Coastal Plain, where it is rarely used owing to greater permeability and water availability in the overlying sedimentary rock. Principal crystalline-rock units of the Piedmont include those of the Inner Piedmont terrane, Laurens thrust stack, Charlotte and Eastern Charlotte terranes, and Carolina Slate Belt. Rocks of the Chauga Belt and Blue Ridge terrane are the main units in the Blue Ridge province

The crystalline-rock aquifer is complex both lithologically and structurally. It includes rocks formed deep in the earth's crust through numerous mountain-building events. They are cut by fracture systems formed not only by pressure during mountain building but by later tension during the formation of the Atlantic Ocean and by release of pressure as overlying rocks were eroded. The result is a complex network of fractures, sparse in some areas and dense in others, especially along fault zones. The size, number, and extent of fractures diminish with increasing depth, and most crystalline-rock wells are less than 400 feet deep. More than 70 percent of reported well yields

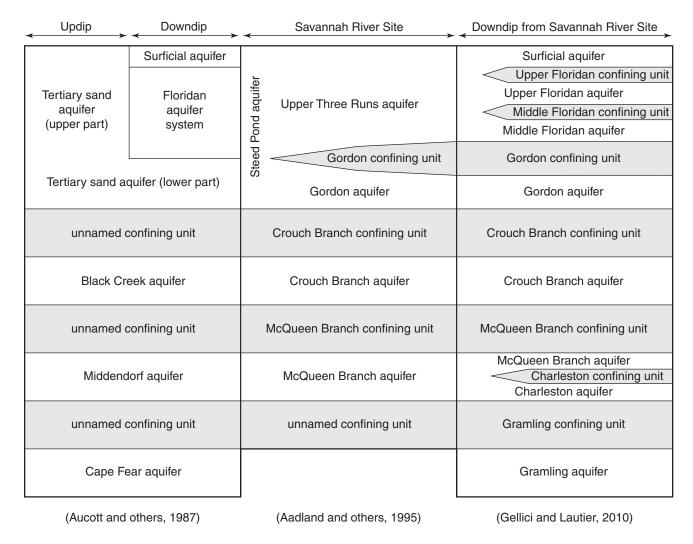


Figure 2. Hydrostratigraphy of Aucott and others (1987), Aadland and others (1995), and Gellici and Lautier (2010).

are less than 20 gpm (gallons per minute), and almost half are less than 10 gpm. Contractors rarely guarantee well yield, owing to the chance of drilling a dry hole. Nonetheless, yields greater than 100 gpm have been reported, and the probability of obtaining such yields increases where well-site selection is guided by geologic and geophysical investigation.

Water levels were measured from 14 wells completed in the crystalline-rock aquifer during 2006–2010 (Fig. 3). Water levels in these wells fluctuated from 2 to 17 ft over the five-year period (Appendix A). Well SAL-0069 had the greatest overall water-level change, dropping about 16 ft in a single year (2007). The water level in well GRV-0712 also changed significantly, dropping about 12 ft in 2007.

With a few exceptions, seasonal fluctuations are observed on the hydrographs, with high water levels occurring primarily from February–May and lows from September–December. This seasonal pattern is common in wells throughout the State. Aquifers are usually recharged

during the cooler, dormant seasons when evapotranspiration rates are low, and are depleted during the warmer, growing seasons when evapotranspiration rates are high. Several wells, such as CRK-0074, LRN-1706, and GRV-3342, display less seasonality in their hydrographs, especially during the peak of the drought in 2007 and 2008. Relatively steady water-level declines occurred in these wells from mid 2007 through the early part of 2009 without the corresponding rise that typically occurs in late winter and early spring.

Water levels in most wells were at their lowest point during September–December of 2007 and 2008, due to the drought. In many wells, low water levels occurred a month later in 2007 (October–December) than they did in 2008 (September–November). Of the 14 wells completed in the crystalline rock aquifer, nine had record low water levels over the past five years and one well tied its record low (Table 4). Most of the previous low marks were set during the 1998–2002 drought.

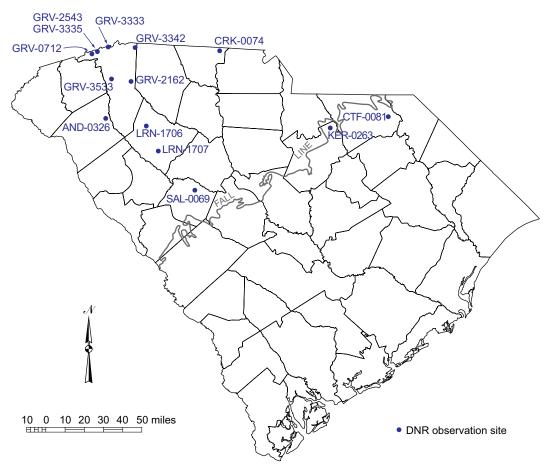


Figure 3. Location of crystalline-rock aquifer observation wells.

Table 4. Recent record-low water levels in the crystalline-rock aquifer

| Well | Previous record low (Date) | New record low (Date) | Difference (ft) |
|----------|----------------------------|---------------------------|-----------------|
| CRK-0074 | 78.35 ft bls (10/2/2002) | 78.44 ft bls (1/28/2009) | 0.09 |
| GRV-0712 | 38.58 ft bls (9/22/2002) | 43.74 ft bls (12/22/2007) | 5.16 |
| GRV-2162 | 43.75 ft bls (12/9/2001) | 44.69 ft bls (11/26/2008) | 0.94 |
| GRV-2543 | 17.31 ft bls (11/1/2004) | 17.40 ft bls (10/3/2007) | 0.09 |
| GRV-3333 | 34.76 ft bls (10/15/2002) | 35.41 ft bls (12/8/2008) | 0.65 |
| GRV-3335 | 8.97 ft bls (9/24/1999) | 8.97 ft bls (10/20/2008) | 0.00 |
| GRV-3342 | 49.64 ft bls (11/18/2002) | 49.76 ft bls (1/9/2009) | 0.12 |
| LRN-1706 | 110.41 ft bls (9/16/2002) | 110.72 ft bls (2/26/2009) | 0.31 |
| LRN-1707 | 73.46 ft bls (11/7/2002) | 73.95 ft bls (11/21/2008) | 0.49 |
| SAL-0069 | 25.89 ft bls (10/30/1993) | 26.38 ft bls (12/31/2010) | 0.49 |

bls: below land surface

Shallow Aquifer System

"Shallow aquifer system" is a term of convenience applied to the complex of materials between land surface and the major aquifers of the Blue Ridge, Piedmont, and Coastal Plain. This aquifer system is equivalent to the surficial aquifer of Aucott and others (1987) for the Coastal Plain.

The shallow aquifer system in the Blue Ridge and Piedmont consists of porous materials overlying the fractured crystalline-rock aquifer system. Saprolite, the residual material from the weathering of bedrock, forms the most geographically extensive shallow unit above the Fall Line. Saprolite typically is 35 to 100 ft thick, but is thin to absent in some mountainous areas and well over 100 ft in some lower areas. It is usually rich in clay, except where the parent rock is mainly quartz. It is a source of water to bored wells-augered or dug wells that must be constructed with large diameters owing to low permeability and the consequent need to store large volumes of water. Such wells may yield ground water from the clay-rich saprolite, from relict bedrock fractures and intrusive rock, and from the transition zone, a zone of fractured but relatively unweathered rock debris just above the unaltered parent rock. Sustained yields typically are no more than a few gallons per minute; however, the saprolite is the main

source of groundwater storage in the region and the main source of ground water in the underlying crystalline-rock aquifer system. Where the saprolite is thick, water levels usually respond slowly to precipitation because the low permeability of clay inhibits recharge. Water levels also respond slowly to drought because clay will store large volumes of water and release it slowly.

Shallow aquifers above the Fall Line also include modern and relict alluvial deposits. These alluvial aquifers commonly are unconfined, widely dispersed, and small in areal extent. Because of the energy of their source streams, Blue Ridge and Piedmont alluvial aquifers tend to be coarser but less isotropic than their Coastal Plain counterparts. Consequently, well yields can vary widely, even within distances of a few hundred feet.

In the Coastal Plain, the shallow aquifer system consists mainly of coastal terrace deposits, and modern and relict alluvial deposits. Where present, the aquifer is generally less than 40 ft thick and consists primarily of sand, shell, and clay (Aucott and others, 1987). The aquifer is the water-table aquifer and is present throughout most of the lower Coastal Plain and more sporadically in the middle Coastal Plain.

Water levels were measured from five wells completed in the shallow aquifer system during 2006–2010 (Fig. 4), fluctuating from 3 to 8 ft over the five-year period

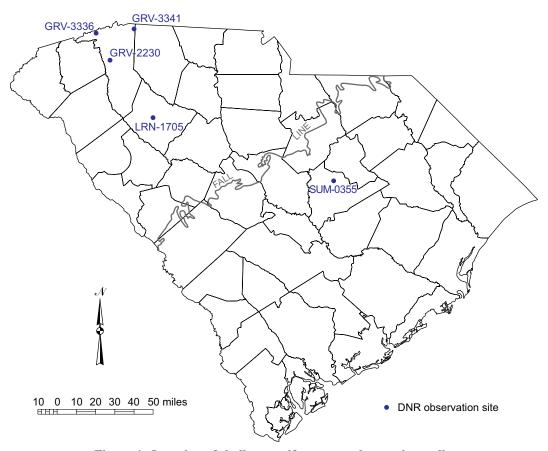


Figure 4. Location of shallow aquifer system observation wells.

(Appendix B). During a given year, water levels varied up to 5 ft. Seasonal fluctuations are evident on most of the hydrographs, with high water levels occurring from February–May and lows from September–December. An exception to this seasonal pattern is at well GRV-3341, which shows declines throughout the winter and spring months of 2008 and 2009, owing to reduced precipitation during the drought.

Water levels in most of the wells were at their lowest during September–December of 2007 and 2008, owing to the drought. Of the five wells completed in the shallow aquifer system, four were also monitored during the 1998–2002 drought. Three of these four wells had record low water levels during the period from 2006 through 2010, breaking previous records that were set during the 1998–2002 drought (Table 5).

Table 5. Recent record-low water levels in the shallow aquifer system

| Well | Previous record low (Date) | New record low (Date) | Difference (ft) |
|----------|----------------------------|---------------------------|-----------------|
| GRV-2230 | 10.30 ft bls (9/13/2002) | 10.82 ft bls (12/25/2007) | 0.52 |
| GRV-3341 | 49.83 ft bls (12/1/2002) | 50.12 ft bls (2/4/2009) | 0.29 |
| LRN-1705 | 16.98 ft bls (8/25/2002) | 18.45 ft bls (10/7/2008) | 1.47 |

bls: below land surface

Cape Fear Aquifer

The Cape Fear aquifer consists principally of the Cape Fear Formation and is the basal aquifer of the South Carolina Coastal Plain. It generally consists of sand and gravel beds separated by thick sections of silt and clay. It is thought to occur mainly in the Lower Coastal Plain and

eastern part of the Upper Coastal Plain. The type locality of the Cape Fear Formation is in North Carolina, and the formation is not known to outcrop in South Carolina. Structure contours on the top of the aquifer are shown in Figure 5. Few wells penetrate the aquifer, hence hydraulic and water-quality data are scarce. In general, the aquifer is thought to be much less permeable and productive than

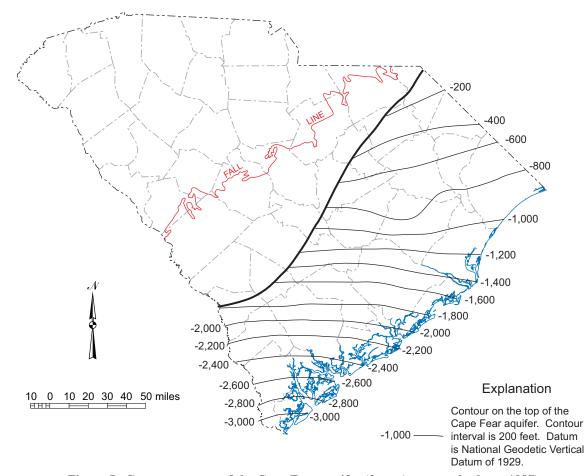


Figure 5. Contours on top of the Cape Fear aquifer (from Aucott and others, 1987).

the overlying Middendorf aquifer, and it is likely to contain more highly mineralized water.

Wells ALL-0348 and MRN-0078 are the only observation wells known to be completed solely in the Cape Fear (Fig. 6). Owing to its great depth and to lack of development by water users, the Cape Fear aquifer experiences only small seasonal water-level fluctuations and shows little response to drought. Water-levels fluctuated from about 1 to 6 ft in wells completed in the aquifer during 2006-2010 (Appendix C). Both wells that are being monitored hit their all-time low water level during the past five years (Table 6). ALL-0348, located near Allen-

dale, had a low of 81.91 ft bls (feet below land surface) on August 4, 2008. The previous low was recorded on August 1, 1996, when it was 81.59 ft bls. Water levels in this well varied by only 1 foot over the course of the five-year period but slight seasonal fluctuations and the effects of the recent drought can be observed on the hydrograph. The other well screened in the Cape Fear aquifer (MRN-0078) is a flowing artesian well located at Brittons Neck. Its previous low water level was 35.69 ft als (feet above land surface) on August 29, 1999. A new water-level low of 30.00 ft als was measured on August 15, 2007.

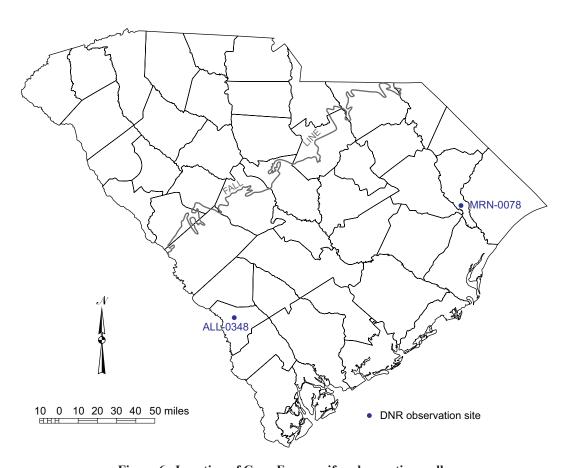


Figure 6. Location of Cape Fear aquifer observation wells.

Table 6. Recent record-low water levels in the Cape Fear aquifer

| Well | Previous record low (Date) | New record low (Date) | Difference (ft) |
|----------|----------------------------|--------------------------|-----------------|
| ALL-0348 | 81.59 ft bls (8/1/1996) | 81.91 ft bls (8/4/2008) | 0.32 |
| MRN-0078 | 35.69 ft als (8/29/1999) | 30.00 ft als (8/15/2007) | 5.69 |

bls: below land surface; als: above land surface

Middendorf Aquifer

The Middendorf aquifer is composed mostly of Middendorf Formation sediments, but locally it includes parts of adjacent formations. In the updip areas, the aquifer is interbedded sand and clay lenses that were deposited in an upper delta plain environment. Near the coast, the aquifer encompasses thin- to thick-bedded sand and clay deposited in marginal marine or lower delta plain environments. In general, the Middendorf aquifer has coarser sand and less clay in the western part of the Coastal Plain than in the eastern part.

The Middendorf crops out along the Fall Line from Chesterfield County to Edgefield County, except for some areas of Aiken County where it is not exposed (Fig. 7). Its outcrop is narrowest in southwestern Edgefield County and widest in Chesterfield County. The aquifer dips southeastward near the Fall Line and southward along the coast. The top of the aquifer is at elevation 100, -700, and -1,700 ft msl (mean sea level) at Aiken, Little River, and Charleston, respectively. Thickness ranges from 0 at the Fall Line to more than 300 ft in Dorchester County.

Wells that tap the Middendorf aquifer can be found in nearly all of South Carolina's Coastal Plain counties, and it is the State's most widely used artesian aquifer. Well depths range from a few tens of feet in its outcrop and subcrop areas, where locally it is unconfined, to more than 2,700 ft in Beaufort County. Individual well yields that locally exceed 2,000 gpm and commonly exceed 500 gpm were reported by Newcome (2000). He reported transmissivities of up to 400,000 gpd/ft (gallons per day per foot) and specific capacities as great as 75 gpm/ft (gallons per minute per foot of drawdown). Coarse sand and gravel formations occur in the aquifer in its subcrop area and, where incised by stream erosion, substantially contribute to the base flow of both Upper Coastal Plain and throughflowing streams.

Water levels were measured from 28 wells completed in the Middendorf aquifer during 2006–2010 (Fig. 8). Water levels in these wells fluctuated from 2 to 12 ft over the five-year period (Appendix D). Well FLO-0128, located about 10 miles east of Florence, had the greatest overall water-level change, rising about 12 ft from a low of 53.92 ft bls in early 2006 to a high of 41.24 ft bls in early 2010.

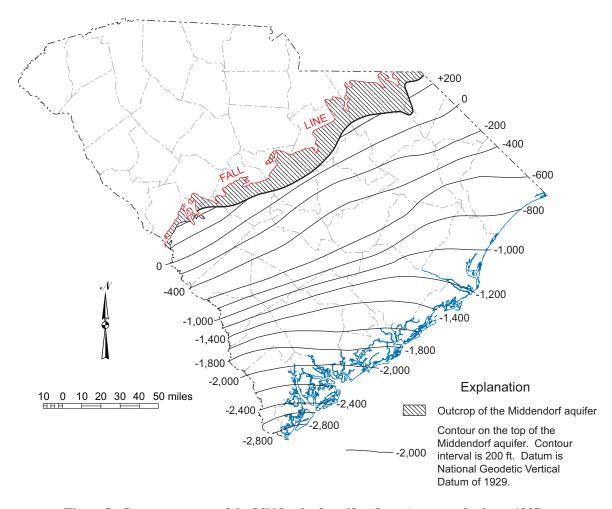


Figure 7. Contours on top of the Middendorf aquifer (from Aucott and others, 1987).

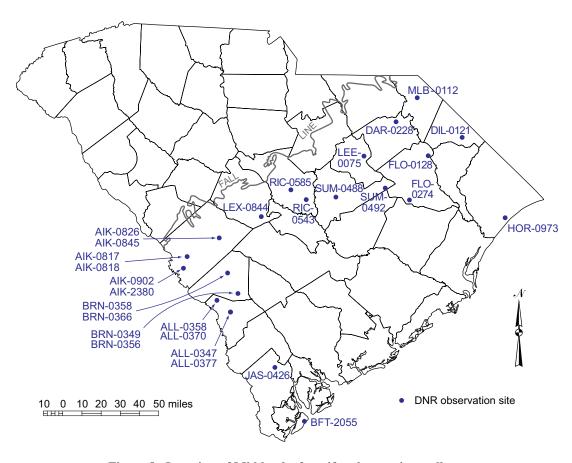


Figure 8. Location of Middendorf aquifer observation wells.

The water level in well SUM-0492, located in eastern Sumter County, had the greatest yearly change, dropping about 7 ft in 2010. This well might be influenced by local pumping from a public supply well in Woods Bay State Park.

Seasonal water-level fluctuations are evident on most of the hydrographs, with high levels occurring during the late winter and early spring months (February–May) and lows occurring most often from September–December. Several wells do not show a strong seasonal signal, possibly due to increased pumping from nearby wells. For example, at well FLO-274 in Lake City, water levels tend to level off during the typical recharge period (February–May) but do not fully recover to levels attained in the previous year. As a result, water levels in this well have been steadily dropping for the past five years. A similar observation is made of wells ALL-0377 and LEX-0844.

Water levels in most of the wells were usually at their lowest point during September–December of 2007 and 2008, owing to the drought. Water levels in some wells

were also low in late 2009 as the drought extended into the summer of 2009. Of the 28 wells completed in the Middendorf aquifer, water levels from 15 were also monitored during the 1998–2002 drought. Nine of the 15 had all-time low water levels in the past five years (Table 7).

Long-term trends in the Middendorf aquifer

In southern Florence County, the water level in the Middendorf aquifer has steadily dropped about 10 ft over the past ten years at well FLO-0274 in Lake City (Fig. 9). In southern Lexington County, the water level in the Middendorf declined about 10 ft during the 1998–2002 drought, leveled off after the drought, and has yet to fully recover to pre-drought levels (Fig. 10). Similar declines are noted in the Middendorf aquifer in Aiken, Allendale, and Barnwell Counties, where water levels have dropped 3 to 10 ft since the mid-1990s (Figs. 11–13).

Well BFT-2055, at Hilton Head Island, is screened in both the Cape Fear and Middendorf aquifers; measurements therefore reflect composite water levels. They are

Table 7. Recent record-low water levels in the Middendorf aquifer

| Well | Previous record low (Date) | New record low (Date) | Difference (ft) |
|----------|----------------------------|---------------------------|-----------------|
| ALL-0347 | 97.75 ft bls (1/24/2003) | 99.32 ft bls (5/27/2009) | 1.57 |
| ALL-0358 | 60.08 ft bls (11/18/2002) | 62.78 ft bls (9/19/2008) | 2.70 |
| ALL-0377 | 96.42 ft bls (1/30/2003) | 99.07 ft bls (10/23/2008) | 2.65 |
| BFT-2055 | 134.01 ft als (8/5/2005) | 127.79 ft als (2/24/2009) | 6.22 |
| FLO-0274 | 66.62 ft bls (11/20/2005) | 70.97 ft bls (12/30/2010) | 4.35 |
| HOR-0973 | 81.86 ft als (1/27/2005) | 79.69 ft als (1/10/2008) | 2.17 |
| JAS-0426 | 71.40 ft als (10/3/2005) | 66.18 ft als (11/4/2009) | 5.22 |
| LEX-0844 | 75.76 ft bls (1/27/2003) | 76.75 ft bls (10/23/2008) | 0.99 |
| RIC-0543 | 47.07 ft bls (9/24/2002) | 50.38 ft bls (8/1/2008) | 3.31 |

bls: below land surface; als: above land surface

presumed to more closely reflect Middendorf water levels, owing to that system's greater thickness and hydraulic conductivity. Consequently, BFT-2055 measurements are presented with Middendorf aquifer data. Water levels in wells BFT-2055 and JAS-0426 have also been declining over the past 10 years, by 28 ft in BFT-2055 (Fig. 14) and by about 12 ft in JAS-0426 (Fig. 15).

In well FLO-0128, the water level has been recovering since August 1999 when it hit an all-time low of 92.07 ft bls (Fig. 16). By 2010, the water level recovered to 41.24 ft bls, as the City of Florence continues to supplement its ground-water supply with surface water from the Pee Dee River.

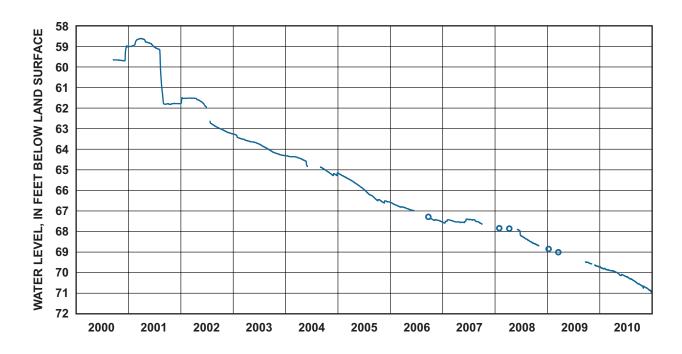


Figure 9. Period-of-record hydrograph for well FLO-0274 (Middendorf).

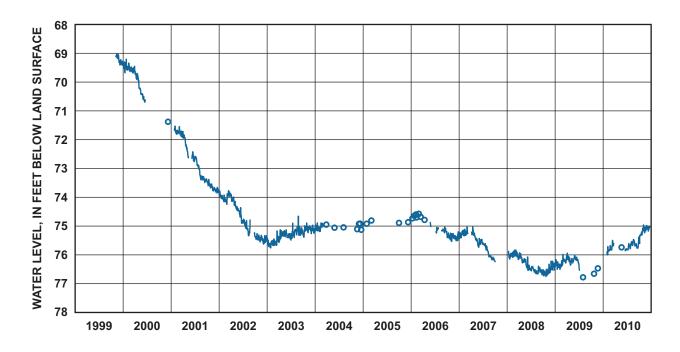


Figure 10. Period-of-record hydrograph for well LEX-0844 (Middendorf).

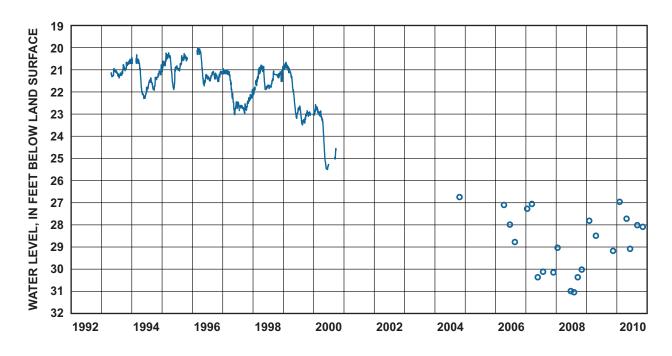


Figure 11. Period-of-record hydrograph for well AIK-0845 (Middendorf).

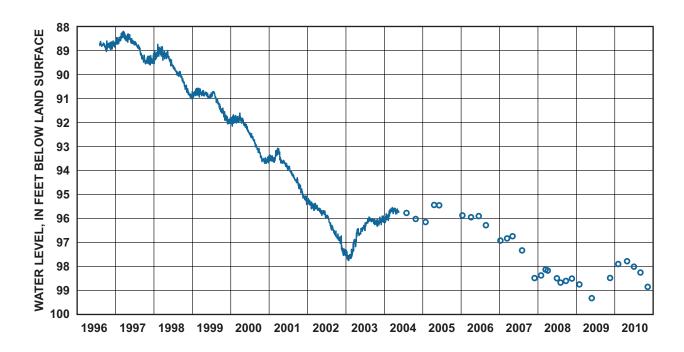


Figure 12. Period-of-record hydrograph for well ALL-0347 (Middendorf).

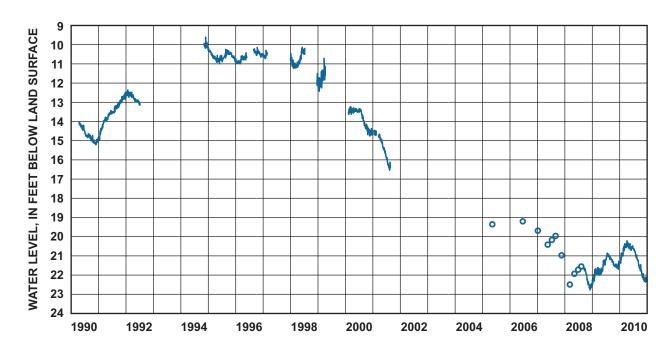


Figure 13. Period-of-record hydrograph for well BRN-0349 (Middendorf).

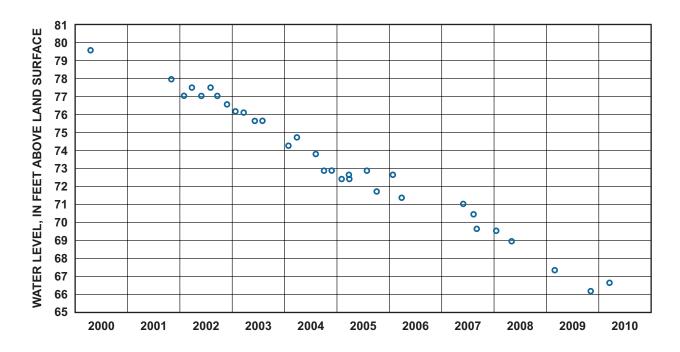


Figure 14. Period-of-record hydrograph for well JAS-0426 (Middendorf).

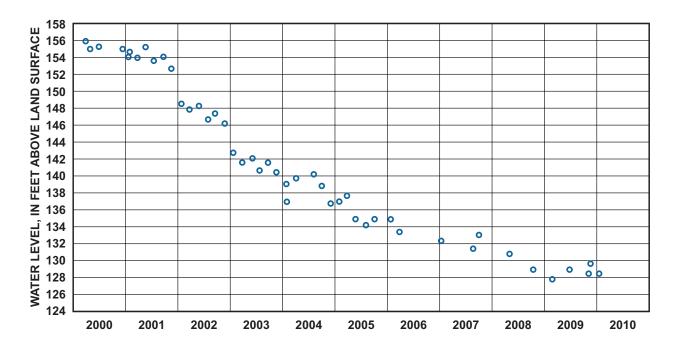


Figure 15. Period-of-record hydrograph for well BFT-2055 (Middendorf).

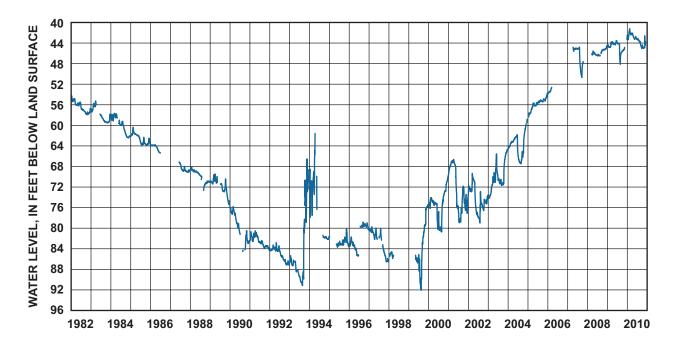


Figure 16. Period-of-record hydrograph for well FLO-0128 (Middendorf).

Black Creek Aquifer

Aucott and others (1987) delineated the Black Creek aquifer on the basis of geologic data (primarily geophysical well logs), water-level data, water-chemistry data, and previous investigations. The Black Creek is the youngest of the Cretaceous aquifers in the region. It is composed mostly of permeable sediments of the Black Creek Formation but locally includes sediments of overlying Tertiary-age formations and the overlying Peedee Formation. The aquifer encompasses thin- to thick-bedded sand and clay beds that were deposited in marginal marine or delta plain environments. The coarsest sand and least clay content are found in the western part of the Coastal Plain.

The aquifer crops out in the eastern Coastal Plain along a narrow band extending from Lexington County to Sumter County, thence along a wider area from Sumter County to Dillon County. It dips southeastward toward the coast. The top of the aquifer is at elevation 300, -250, and -1,000 ft msl at Aiken, Little River, and Charleston, respectively. Thickness ranges from about 100 ft near Aiken to more than 400 ft at the coast. Its outcrop and subcrop areas and its structure are delineated in Figure 17.

The Black Creek aquifer is an important source of water supply. Well yields are greatest in the counties of the Upper and Middle Coastal Plain and are least in the coastal counties of Charleston and Beaufort. Where the highest possible well yields are desired, the Black Creek aquifer is screened in conjunction with the underlying Middendorf aquifer. These multi-aquifer wells are commonly used by major industrial and public-supply systems in Sumter, Florence, Horry, and Georgetown Counties.

Water levels were measured from 23 wells completed in the Black Creek aquifer from 2006 through 2010 (Fig. 18) and levels fluctuated from 2 to 27 ft over the five-year period (Appendix E). The water level in well HOR-0309, located in Conway, had the greatest overall change, dropping about 27 ft from its high in early 2006 to its low in late 2009. Well ORG-0393, located in downtown Orangeburg, saw its water level drop about 20 ft from a high of 103 ft bls in early 2006 to a low of about 123 ft bls in late 2007. In 2007 alone, the water level in this well dropped 18 ft. Seasonal water-level fluctuations are evident on most of the hydrographs, with high levels occurring from February–May and lows from September–December.

Water levels in most of the wells were at their low-

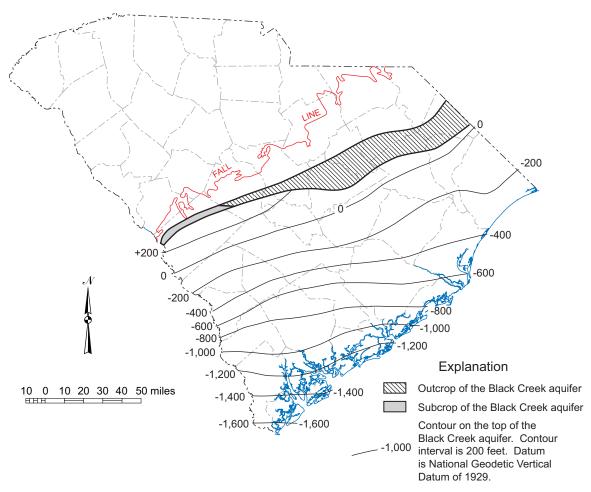


Figure 17. Contours on top of the Black Creek aquifer (from Aucott and others, 1987).

est point during September–December of 2007 and 2008, owing to the drought. It appears that in many wells, low water levels occurred approximately a month later in 2007 (October–December) than they did in 2008 (September–November). Water levels in some wells were also low in late 2009, probably also related to the drought. Of the 23 wells completed in the Black Creek aquifer, water levels from eight were also monitored during the 1998–2002 drought. Seven of the eight had all-time low water levels in the past five years (Table 8).

Long-term trends in the Black Creek aquifer

The water level in well MRN-0077, located at Britons Neck, steadily declined about 40 ft from 1993 to 2010 (Fig. 19). Well FLO-0276, in Lake City, has seen its water level drop 16 ft from 2001 to 2010 (Fig. 20). In Aiken, Allendale, and Barnwell Counties, water levels have dropped 4 to 12 ft in the Black Creek aquifer since the mid-1990s, similar to declines observed in the Middendorf aquifer in these counties (Figs. 21–23).

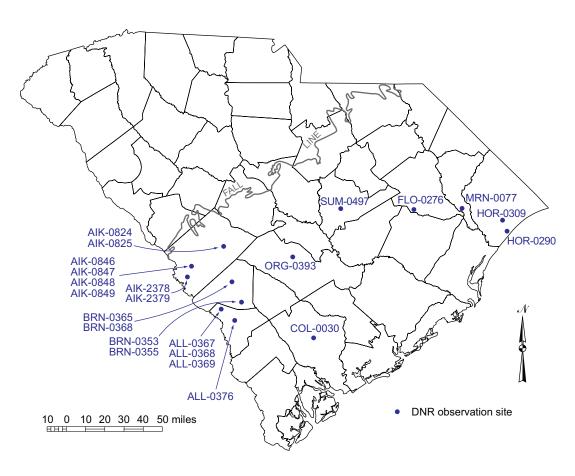


Figure 18. Location of Black Creek aquifer observation wells.

Table 8. Recent record-low water levels in the Black Creek aquifer

| Well | Previous record low (Date) | New record low (Date) | Difference (ft) |
|----------|----------------------------|---------------------------|-----------------|
| ALL-0367 | 94.64 ft bls (9/25/2002) | 95.81 ft bls (9/23/2008) | 1.17 |
| ALL-0376 | 148.00 ft bls (8/21/2002) | 148.58 ft bls (4/8/2008) | 0.58 |
| COL-0030 | 15.79 ft bls (6/4/2000) | 18.83 ft bls (11/11/2008) | 3.04 |
| FLO-0276 | 77.55 ft bls (7/20/2005) | 78.84 ft bls (7/27/2010) | 1.19 |
| HOR-0309 | 97.39 ft bls (8/27/2002) | 112.70 ft bls (9/13/2009) | 15.31 |
| MRN-0077 | 46.60 ft bls (9/28/2005) | 49.23 ft bls (9/24/2010) | 2.63 |
| ORG-0393 | 121.28 ft bls (9/25/2002) | 123.49 ft bls (9/2/2007) | 2.21 |

bls: below land surface

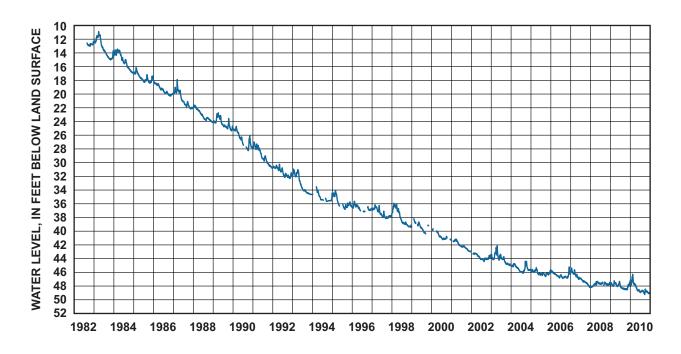


Figure 19. Period-of-record hydrograph for well MRN-0077 (Black Creek).

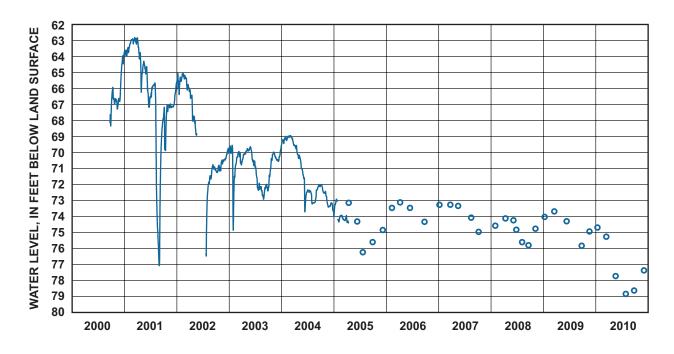


Figure 20. Period-of-record hydrograph for well FLO-0276 (Black Creek).

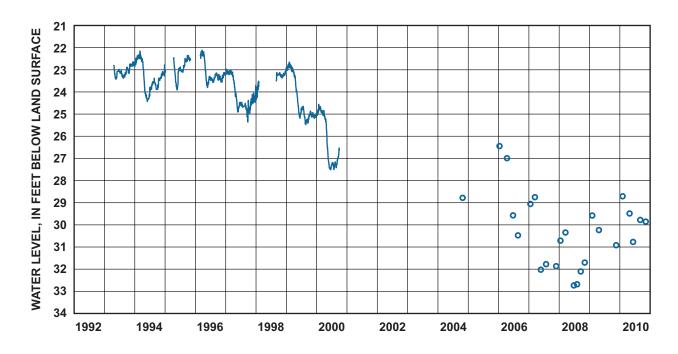


Figure 21. Period-of-record hydrograph for well AIK-0847 (Black Creek).

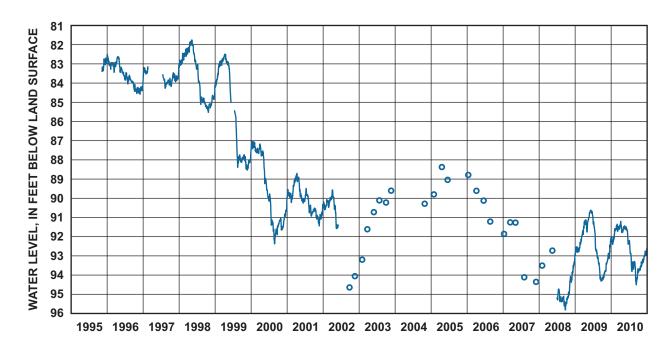


Figure 22. Period-of-record hydrograph for well ALL-0367 (Black Creek).

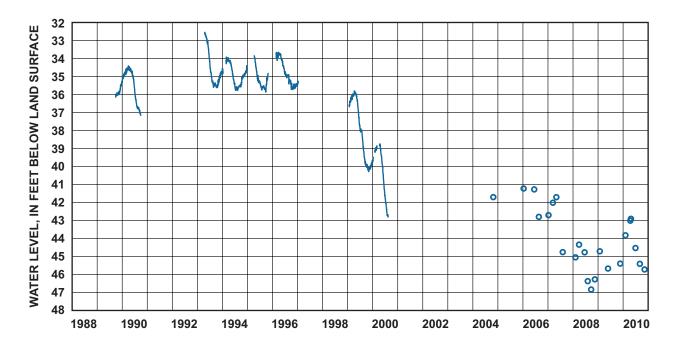


Figure 23. Period-of-record hydrograph for well BRN-0355 (Black Creek).

Tertiary Sand Aquifer

Aucott and others (1987) divided the Tertiary sand aquifer into two parts. The upper part consists of fine- to coarse-grained sand of the Barnwell Group, McBean Formation, and Congaree Formation. They are the sand-facies equivalent of the Floridan aquifer and extend from the vicinity of the Fall Line to the updip limit of the Floridan aquifer. In Allendale, Bamberg, Barnwell, and Aiken Counties the Congaree Formation is the principal waterbearing unit, and the Barnwell Group and McBean Formation tend to be poorly productive and more significant as confining units. Logan and Euler (1989) reported individual wells completed in the Congaree yield up to 660 gpm and have specific capacities of about 10 gpm/ft.

The lower part of the Tertiary-sand aquifer underlies all of the Floridan aquifer, extends westward into the middle Coastal Plain, and consists principally of the Paleocene-age Black Mingo Formation. The upper 50 to 100 ft of the formation consists of interbedded fine- to mediumgrained sand and silty sand, carbonaceous and silty clay, sandstone, and sandy limestone. The section is the only significant water-bearing unit in the Tertiary-sand aquifer east of its outcrop area. In conjunction with the overlying Floridan aquifer, this unit is widely used in Berkeley, Charleston, Dorchester, Colleton, and eastern Hampton

Counties. Open-hole Floridan/Tertiary-sand wells there commonly yield several hundred gallons per minute and locally may produce more than 500 gpm. Wells open only to the Black Mingo Formation are rare and usually produce less than 300 gpm. Because its transmissivity is low, that formation is used mainly where the overlying Floridan aquifer is poorly productive.

Water levels were measured from 10 wells completed in the Tertiary sand aquifer from 2006 through 2010 (Fig. 24). Water levels in these wells fluctuated from 4 to 20 ft over the five-year period (Appendix F). The maximum water level change occurred in well ALL-0365, which had a 20-ft drop from January 2006 to August 2007. The water level in well ORG-0430, located in downtown Orangeburg, dropped about 10 ft in a single year (2007). Seasonal water-level fluctuations are evident on most of the hydrographs, with high water levels occurring during the late winter and early spring months (February–May) and lows occurring most often from late summer to early fall (August–November). Most of the lows observed on the hydrographs occurred either in 2007 or 2008, corresponding to the height of the drought.

Of the ten wells monitored in the aquifer, four were also monitored during the 1998–2002 drought. Two of the four wells had record lows during the period from 2006 to 2010 (Table 9).

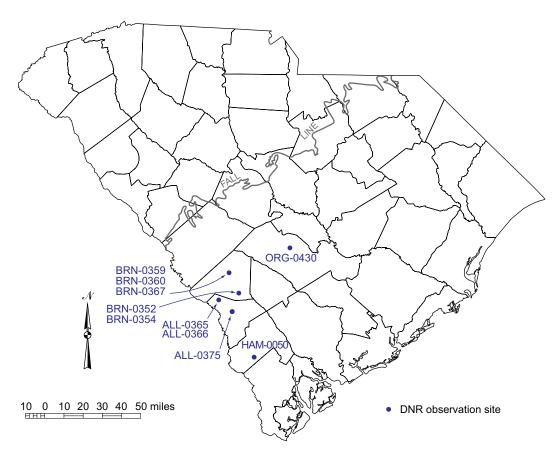


Figure 24. Location of Tertiary sand aquifer observation wells.

Long-term trends in the Tertiary sand aquifer

Water levels in the Tertiary sand aquifer have declined from about 6 to 15 ft in Allendale and Barnwell Counties since the mid-1990s, similar to patterns observed in the Middendorf and Black Creek aquifers in these counties (Figs. 25 and 26). This pattern suggests that aquifers have not fully recovered to levels observed before the 1998–2002 drought.

Floridan Aquifer

The Floridan aquifer in South Carolina is the northern-most part of one of the most extensive and prolific ground-water sources in North America. It primarily consists of the Middle Eocene Santee Limestone and, in southern and southwestern South Carolina, the Upper Eocene Ocala Limestone. It also encompasses, and is confined by,

the Oligocene Cooper Formation in Charleston, Berkeley, Dorchester, and Colleton Counties. The top of the aquifer occurs within 100 ft of land surface, except in southernmost Beaufort and Jasper Counties. Typically, more than 80 percent of the Floridan's thickness is relatively impermeable owing to the widespread occurrence of impure, clayey to sandy limestone and of limestone having interstitial-calcite precipitate; however, sections of clean, permeable, bioclastic limestone are found throughout the Floridan's range of occurrence. These permeable sections yield adequate water for domestic use, small public-supply systems, and light industry, and, locally, they can yield up to 3,000 gpm to individual wells.

The Floridan aquifer outcrops along the Santee River and Wateree River valleys and from eastern Orangeburg County through western Allendale County. The limestone there commonly exceeds 95-percent calcium carbonate,

Table 9. Recent record-low water levels in the Tertiary sand aquifer

| Well | Previous record low (Date) | New record low (Date) | Difference (ft) |
|----------|----------------------------|---------------------------|-----------------|
| ALL-0366 | 130.10 ft bls (7/24/2002) | 135.07 ft bls (8/2/2007) | 4.97 |
| ALL-0375 | 157.68 ft bls (10/9/2002) | 160.88 ft bls (9/22/2008) | 3.20 |

bls: below land surface

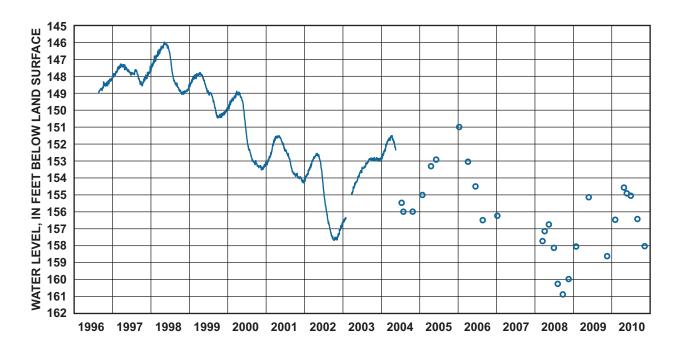


Figure 25. Period-of-record hydrograph for well ALL-0375 (Tertiary sand).

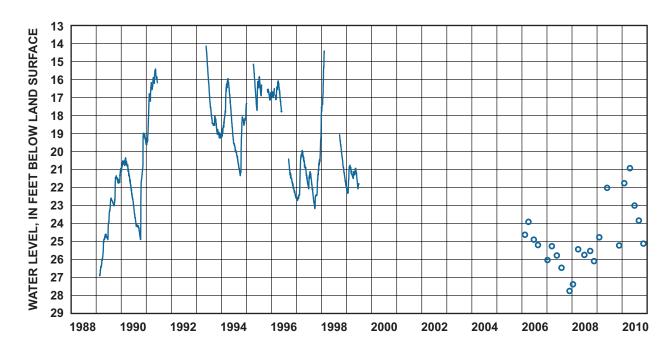


Figure 26. Period-of-record hydrograph for well BRN-0360 (Tertiary sand).

has enlarged secondary porosity owing to dissolution, and locally exhibits cavern and sinkhole formation. The surface of the Santee Limestone and Ocala Limestone components, and the permeable units associated with them, dip gently southeastward from 100 ft msl to -200 ft msl. The low-permeability, arenaceous limestone of the Oligocene Cooper Formation overlies the Santee in most of Charleston, Berkeley, and Dorchester Counties, grades into the Ocala Limestone to the southeast, and thickens to more than 250 ft in southern Charleston County. Owing to this geologic complexity, four important and distinct permeable zones occur in the Floridan aquifer.

Limestone in the outcrop area forms the inland-most permeable zone and is a major avenue for recharge: there, meteoric water has circulated through the pure limestone at shallow depth, secondary porosity is common and well developed, hydraulic conductivity is high, and water-table to poorly confined conditions predominate. The limestone downdip of the subcrop region becomes increasingly arenaceous and confining, and ground water typically is obtained from two thin and well-separated permeable zones.

The northern zone, underlying Charleston, Berkeley, Dorchester, Colleton, and eastern Hampton Counties, occurs near the base of the Santee Limestone at 50 to -500 ft msl: it typically is 5 to 20 ft thick, is moderately permeable, and, in conjunction with underlying sand of the Tertiary-sand aquifer, yields 100 to 400 gpm to individual wells. The southern zone, underlying Jasper County, western Hampton County, and southern Beaufort County, occurs at the top of the Santee Limestone at 0 to -500 ft msl: it typically is 20 to 40 ft thick, has transmissivities as great as 200,000 gpd/ft, and can provide up to 1,000 gpm to individual wells. The geographic distribution of the southern zone roughly coincides with the upper permeable zone of the Ocala Limestone.

The upper permeable zone is the principal source of ground-water supply in Beaufort, Jasper, Hampton, and Allendale Counties. It occurs within the upper 100 ft of the Ocala Limestone, and the top of the unit ranges from -20 ft msl at Beaufort to -250 ft msl near Savannah, Ga. It is as much as 100 ft thick in southern Jasper County and has transmissivities up to 450,000 gpd/ft. Yields as great as 3,000 gpm are reported, and those exceeding 500 gpm are common.

Water levels were measured from 27 wells completed in the Floridan aquifer during 2006–2010 (Fig. 27). Water levels in these wells fluctuated from 2 to 20 ft over the five-year period (Appendix G). Well COL-0016, located in downtown Walterboro, had the greatest change, declining about 20 ft between 2006 and 2008. Some wells, particularly wells inland of coastal areas, had their lowest water levels recorded in September–November of 2007 and 2008, owing mainly to the drought. Wells ORG-0393 and BRK-0644, for example, had lows in September–No-

vember of 2007. Wells in coastal counties, however, generally had their lowest water levels in the summer months, typically from June–August. Well CHN-0484 had its alltime low on July 1, 2007. Wells in Beaufort County had water-level lows primarily in June, July, or early August. These wells include BFT-0101, -0429, -1814, -1822, -1845, and -1846. These low water levels that occur in the summer months as opposed to early fall, when they typically occur in other areas of the State, are probably due to increased pumping from the aquifer for landscape and crop irrigation during the summer months.

Of the 27 wells completed in the Floridan aquifer system, water levels from 19 wells were also measured during the 1998–2002 drought. Nine of the 19 wells had record low water levels over the past five years, exceeding even those that occurred during the 1998–2002 drought (Table 10).

Long-term trends in the Floridan aquifer

Water levels in BFT-0101 have shown a slight recovery during the past ten years after a steady decline throughout the 1970s and 1980s; however, seasonal fluctuations have increased from 1–2 ft to 4–9 ft during the same period (Fig. 28). Well BFT-0429 has seen overall water levels remain steady after a decline of approximately 5 ft during the 1970s and 1980s (Fig. 29). Similar to BFT-0101, the magnitude of seasonal fluctuations in this well has increased from 1–2 ft to 5–7 ft during the past several decades.

Wells COL-0301 and CHN-0484, both located near Edisto Beach, have seen water-level declines of about 8 and 12 ft, respectively, since 2000 (Figs. 30 and 31). The water level in well CHN-0044 has declined about 20 ft since the early 1980s (Fig. 32), and well COL-0097 has seen a decline of about 20 ft since the late 1970s (Fig. 33).

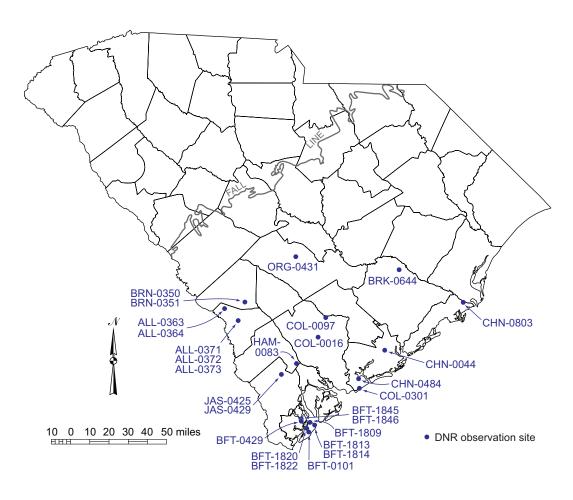


Figure 27. Location of Floridan aquifer observation wells.

Table 10. Recent record-low water levels in the Floridan aquifer

| Well | Previous record low (Date) | New record low (Date) | Difference (ft) |
|----------|----------------------------|---------------------------|-----------------|
| ALL-0363 | 84.79 ft bls (3/24/2003) | 86.16 ft bls (5/29/2009) | 1.37 |
| ALL-0364 | 85.33 ft bls (1/30/2003) | 87.22 ft bls (11/17/2009) | 1.89 |
| BFT-0429 | 32.35 ft bls (6/17/2002) | 32.69 ft bls (6/1/2007) | 0.34 |
| CHN-0044 | 36.39 ft bls (9/27/2005) | 41.66 ft bls (9/25/2010) | 5.27 |
| CHN-0484 | 31.26 ft bls (6/27/2005) | 37.22 ft bls (7/1/2007) | 5.96 |
| COL-0016 | 86.22 ft bls (7/30/2002) | 94.31 ft bls (8/21/2008) | 8.09 |
| COL-0097 | 55.33 ft bls (8/22/2002) | 59.40 ft bls (10/7/2008) | 4.07 |
| COL-0301 | 33.27 ft bls (6/18/2005) | 35.71 ft bls (8/17/2008) | 2.44 |
| HAM-0083 | 44.45 ft bls (8/13/2002) | 46.23 ft bls (12/19/2007) | 1.78 |

bls: below land surface

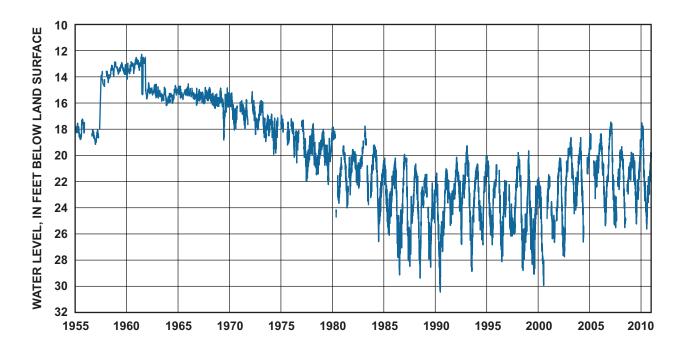


Figure 28. Period-of-record hydrograph for well BFT-0101 (Floridan).

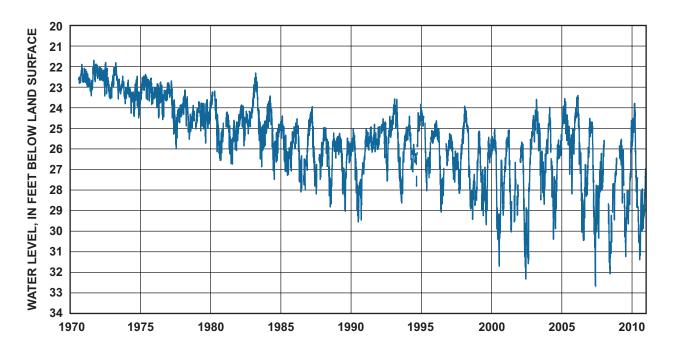


Figure 29. Period-of-record hydrograph for well BFT-0429 (Floridan).

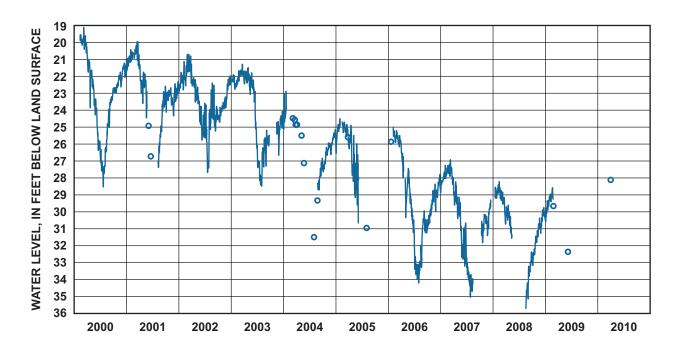


Figure 30. Period-of-record hydrograph for well COL-0301 (Floridan).

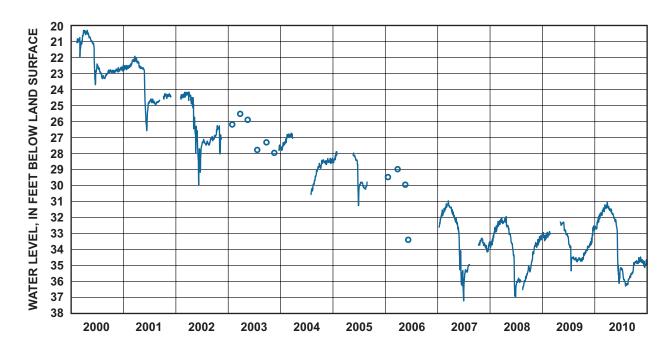


Figure 31. Period-of-record hydrograph for well CHN-0484 (Floridan).

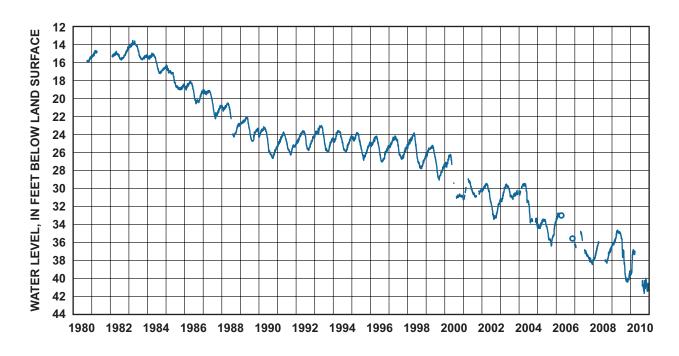


Figure 32. Period-of-record hydrograph for well CHN-0044 (Floridan).

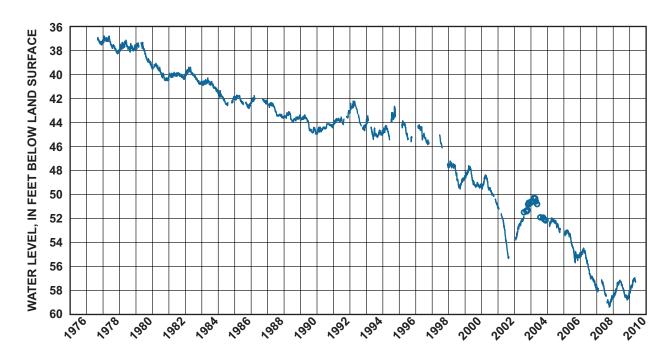


Figure 33. Period-of-record hydrograph for well COL-0097 (Floridan).

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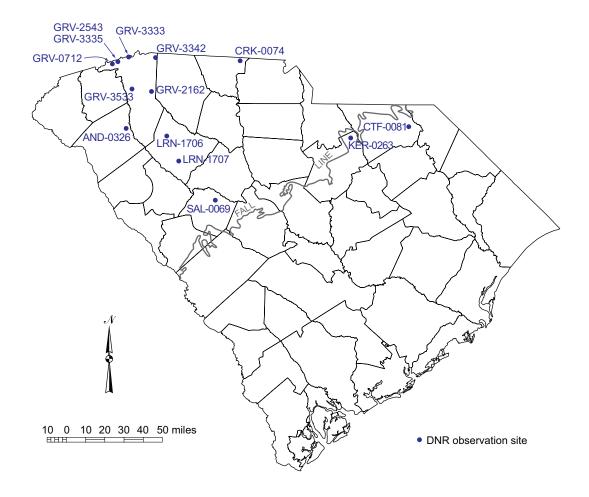
APPENDICES

Hydrographs showing ground-water levels from 2006 through 2010

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| A: Crystalline-rock aquifer | 35 |
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| G: Floridan aquifer | 127 |

APPENDIX A

Ground-water levels in the crystalline-rock aquifer, 2006–2010



ANDERSON COUNTY

 WELL NUMBER: AND-0326
 LATITUDE: 34° 37′ 22″

 GRID NUMBER: 48H-n2
 LONGITUDE: 82° 28′ 55″

LOCATION: Williamston. **AQUIFER:** Crystalline rock.

WELL CHARACTERISTICS: 8.25-inch diameter observation well. Depth: 398 ft. Open hole below 75 ft. **LAND SURFACE ELEVATION:** 795 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of casing, 1.10 ft above land surface.

PERIOD OF RECORD: October 1993 to current year.

EXTREMES: Highest water level: 1.90 ft below land surface, April 23, 1998. Lowest water level: 5.64 ft below land surface, June 24, 2002.

REMARKS: Monitored by USGS until December 2009, then by DNR to current year.

| WATER LEVEL, IN FEET BELOW LAND SURFACE | 3 | | | han john w | Jan | | Mand | (Arada) | | | | | My | Mortune | |
|---|----|--------------|--------------|--|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------|
| > | 5 | | 2006 | <u> </u> | | 2007 | | | 2008 | | | 2009 | | 20 | 010 |
| | | | | | | | | | | | | | | | |
| | | | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | ОСТ | NOV | DEC | YEAR |
| 20 | 06 | HIGH MEAN | 3.11 | 3.09 | 3.07 | 3.12 3.20 | 3.26 | 3.21 | 3.30 | 3.42 | 3.51 | 3.48 | 3.36 | 3.26 | 3.07 (Mar 21) |
| 20 | 00 | LOW | 3.19 3.27 | 3.12 3.15 | 3.12 3.15 | 3.20 | 3.31 3.37 | 3.39 3.51 | 3.39 3.49 | 3.52 3.57 | 3.55 3.58 | 3.56 3.62 | 3.42 3.51 | 3.35 3.40 | 3.34 3.62 (Oct 15) |
| | | LOW | 5.27 | 3.13 | 5.15 | 3.20 | 5.57 | 0.01 | 0.40 | 5.57 | 3.30 | 5.02 | 0.01 | 3.40 | 3.02 (00: 13) |
| | | HIGH | 3.06 | 3.03 | 2.78 | 2.95 | 3.04 | 3.25 | 3.40 | 3.71 | 4.21 | 4.31 | 4.39 | 3.70 | 2.78 (Mar 2) |
| 20 | 07 | MEAN | 3.24 | 3.13 | 2.96 | 3.03 | 3.17 | 3.36 | 3.57 | 4.06 | 4.34 | 4.41 | 4.46 | 4.25 | 3.67 |
| | | LOW | 3.32 | 3.19 | 3.01 | 3.11 | 3.26 | 3.46 | 3.69 | 4.44 | 4.54 | 4.47 | 4.51 | 4.43 | 4.54 (Sep 13) |
| | | HIGH | 3.68 | 3.57 | 3.38 | 3.36 | 3.49 | 3.52 | 3.66 | 3.79 | 4.09 | 3.86 | 3.79 | 3.66 | 3.36 (Apr 6) |
| 20 | 80 | MEAN | 3.74 | 3.62 | 3.46 | 3.46 | 3.52 | 3.59 | 3.71 | 3.99 | 4.29 | 3.99 | 3.93 | 3.73 | 3.75 |
| | | LOW | 3.83 | 3.65 | 3.59 | 3.59 | 3.53 | 3.65 | 3.77 | 4.38 | 4.46 | 4.16 | 4.06 | 3.83 | 4.46 (Sep 15) |
| | | шон | 2.50 | 2.00 | 2.00 | 2.07 | 0.04 | 0.05 | | | | 2.00 | 2.07 | | |
| 20 | 09 | HIGH | 3.50 | 3.60 | 3.22 | 3.07 | 2.84 | 2.95 | | | | 3.29 | 3.07 | | |
| ∠0 | บษ | MEAN | 3.78 | 3.73 | 3.36 | 3.16 | 3.10 | 3.05 | | | | 3.39 | 3.20 | | |
| | | LOW | 3.84 | 3.80 | 3.48 | 3.25 | 3.18 | 3.15 | | | | 3.54 | 3.33 | | |
| | | HIGH | 2.59 | 2.45 | 2.58 | 2.63 | 2.76 | 2.71 | 3.05 | 3.28 | 3.49 | 3.62 | 3.69 | 3.49 | 2.45 (Feb 6) |
| 20 | 10 | MEAN | 2.97 | 2.59 | 2.66 | 2.79 | 2.84 | 2.92 | 3.20 | 3.40 | 3.72 | 3.80 | 3.79 | 3.52 | 3.18 |
| | | LOW | 4.69 | 2.74 | 2.75 | 2.84 | 2.92 | 3.10 | 3.31 | 3.48 | 3.97 | 3.96 | 3.83 | 3.56 | 4.69 (Jan 19) |
| | | | | | | | | | | | | | | | |

CHEROKEE COUNTY

 WELL NUMBER: CRK-0074
 LATITUDE: 35° 09′ 19″

 GRID NUMBER: 36B-b16
 LONGITUDE: 81° 26′ 34″

LOCATION: Blacksburg. **AQUIFER:** Crystalline rock.

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 265 ft. Open hole below 99 ft. **LAND SURFACE ELEVATION:** 825 ft (map estimate) above National Geodetic Vertical Datum of 1929.

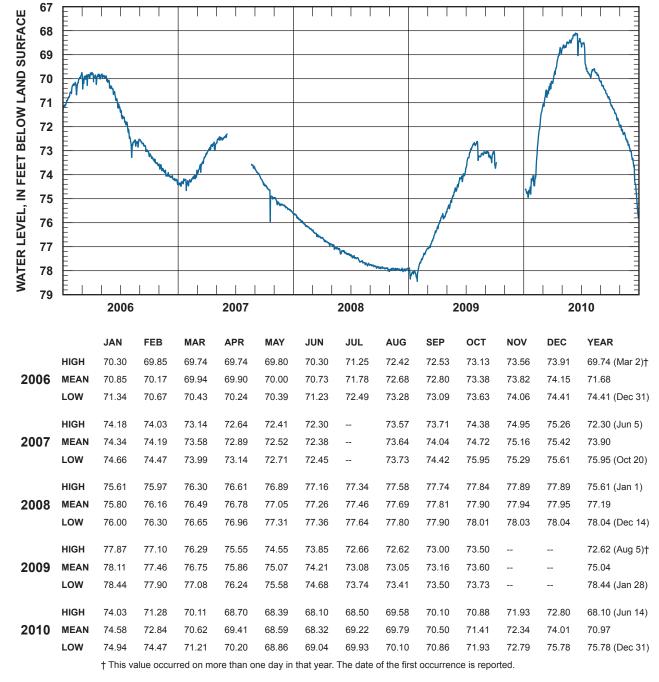
MEASURING POINT: Top of casing, 1.30 ft above land surface.

PERIOD OF RECORD: March 1998 to current year.

EXTREMES: Highest water level: 54.45 ft below land surface, August 31, 2003.

Lowest water level: 78.44 ft below land surface, January 28, 2009.

REMARKS: Monitored by USGS until October 2009, then by DNR to current year.



CHESTERFIELD COUNTY

 WELL NUMBER: CTF-0081
 LATITUDE: 34° 38′ 35″

 GRID NUMBER: 17H-f1
 LONGITUDE: 79° 54′ 42″

LOCATION: Cheraw, 2.5 miles south (Cheraw State Park).

AQUIFER: Crystalline rock (phyllite to schist).

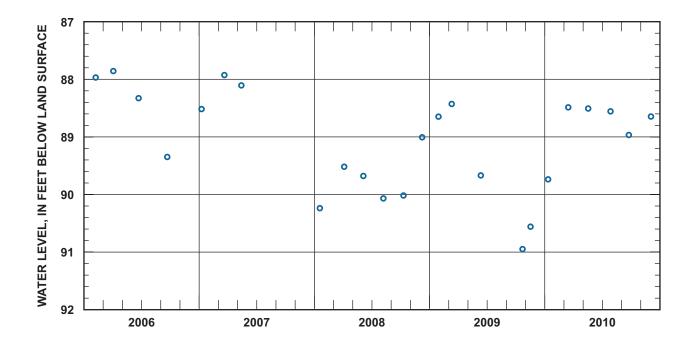
WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 244 ft. Screened from 231 to 244 ft. **LAND SURFACE ELEVATION:** 190 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 1.80 ft above land surface.

PERIOD OF RECORD: October 1999 to current year.

EXTREMES: Highest water level: 87.19 ft below land surface, March 28, 2000. Lowest water level: 91.35 ft below land surface, August 27, 2002.

REMARKS: Drilled and cored for DNR/USGS aguifer delineation project.



WELL NUMBER: GRV-0712 **LATITUDE**: 35° 06′ 24″ GRID NUMBER: 50B-r1 **LONGITUDE**: 82° 37′ 34″

LOCATION: Marietta, 8 miles northwest (Caesars Head State Park).

AQUIFER: Crystalline rock (metamorphic).

30

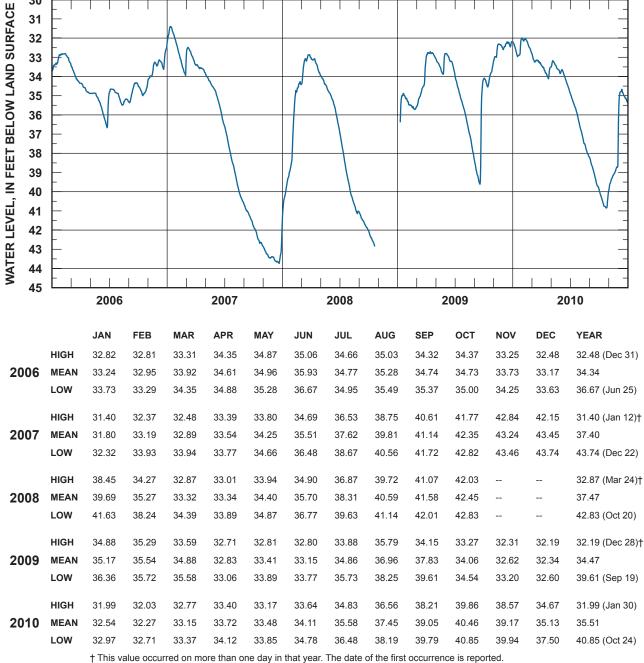
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 450 ft. Open hole below 28 ft. LAND SURFACE ELEVATION: 3,150 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of casing, 0.46 ft above land surface.

PERIOD OF RECORD: October 1993 to current year.

EXTREMES: Highest water level: 26.58 ft below land surface, August 18 and 19, 1994. Lowest water level: 43.74 ft below land surface, December 22, 2007.

REMARKS: Monitored by USGS from October 1993 to July 2003, then by DNR to current year.



WELL NUMBER: GRV-2162 LATITUDE: 34° 54′ 16″ **GRID NUMBER:** 46E-a2 **LONGITUDE**: 82° 15′ 48″

LOCATION: Greer (East Riverside Park). AQUIFER: Crystalline rock (metamorphic).

38

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 281 ft. Open hole below 83 ft. LAND SURFACE ELEVATION: 875 ft (map estimate) above National Geodetic Vertical Datum of 1929.

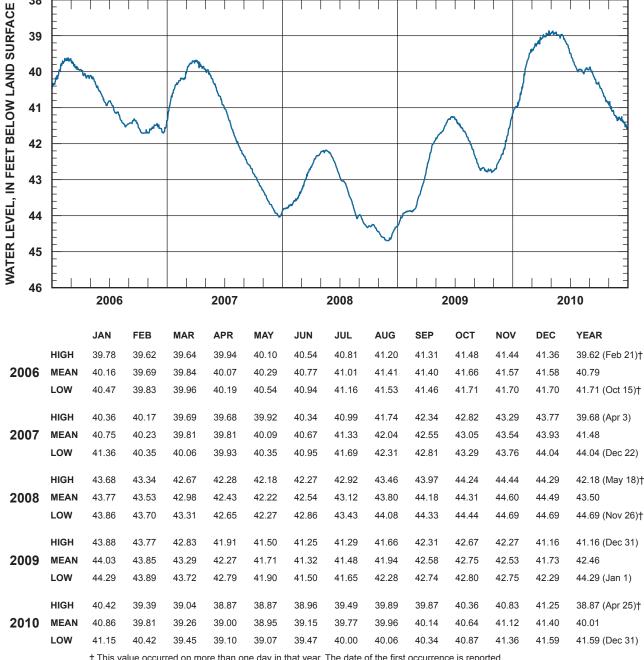
MEASURING POINT: Top of casing, 1.53 ft above land surface.

PERIOD OF RECORD: June 2001 to current year.

EXTREMES: Highest water level: 35.47 ft below land surface, July 10, 2003.

Lowest water level: 44.69 ft below land surface, November 26, 2008.

REMARKS: Monitored by USGS from June 2001 to July 2003, then by DNR to current year.



WELL NUMBER: GRV-2543 **LATITUDE:** 35° 07′ 34″ **GRID NUMBER:** 49B-02 **LONGITUDE:** 82° 34′ 16″

LOCATION: Marietta, 7 miles north-northwest (Jones Gap State Park).

AQUIFER: Crystalline rock (metamorphic).

11

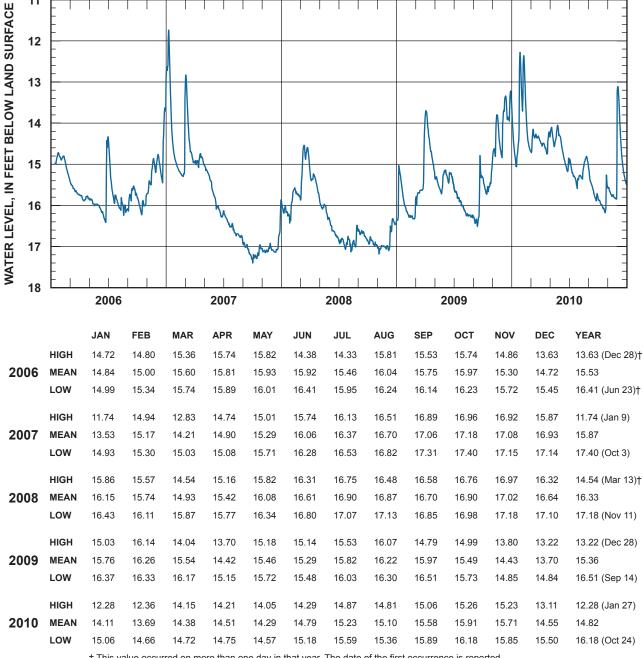
WELL CHARACTERISTICS: 6-inch diameter unused well. Depth: 50 ft. Open interval unknown. **LAND SURFACE ELEVATION:** 1,330.65 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of instrument platform, 1.32 ft above land surface.

PERIOD OF RECORD: October 1997 to current year.

EXTREMES: Highest water level: 11.04 ft below land surface datum, September 9, 2004. Lowest water level: 17.40 ft below land surface datum, October 3, 2007.

REMARKS: Former fish hatchery well. Near present park public supply well and shows minor pumping effects. Located at the foot of a major cliff, the Blue Ridge Escarpment. May be open to transition zone between rock and saprolite.



WELL NUMBER: GRV-3333 **LATITUDE:** 35° 09′ 58″ **GRID NUMBER:** 48B-d3 **LONGITUDE:** 82° 28′ 17″

LOCATION: Marietta, 7.5 miles north. **AQUIFER:** Crystalline rock (metamorphic).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 264 ft. Open hole below 58 ft.

LAND SURFACE ELEVATION: 1,872.84 ft above National Geodetic Vertical Datum of 1929.

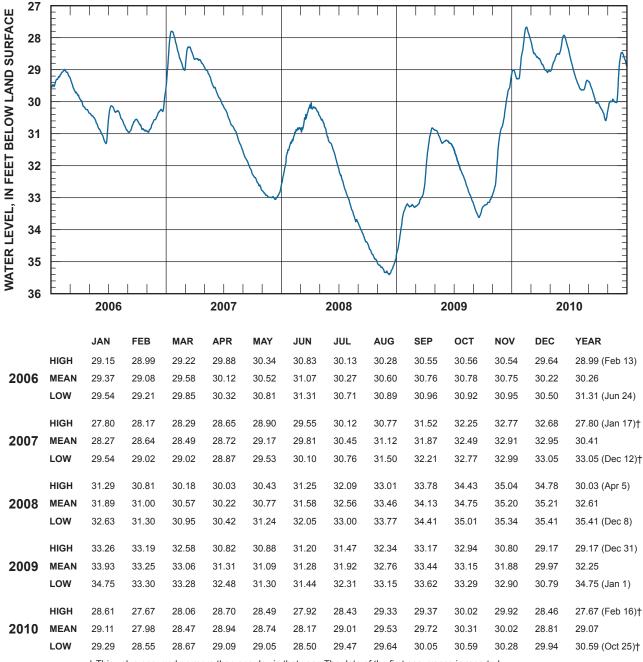
MEASURING POINT: Top of casing, 1.24 ft above land surface.

PERIOD OF RECORD: July 1997 to current year.

EXTREMES: Highest water level: 26.10 ft below land surface, May 9, 1998. Lowest water level: 35.41 ft below land surface, December 8, 2008.

REMARKS: 6-inch steel casing from 1 to 20 ft below land surface; 4-inch PVC casing from 1 to 58 ft below land surface; K-packer at 58 ft. Large fracture at 50 ft apparently captured all cuttings

from below that level. No significant fractures below 58 ft; low water production.



WELL NUMBER: GRV-3335 **LATITUDE:** 35° 07′ 30″ **GRID NUMBER:** 49B-04 **LONGITUDE:** 82° 34′ 25″

LOCATION: Marietta, 7 miles north-northwest (Jones Gap State Park).

AQUIFER: Crystalline rock (metamorphic).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 110 ft. Open hole below 62 ft.

LAND SURFACE ELEVATION: 1,353.52 ft above National Geodetic Vertical Datum of 1929.

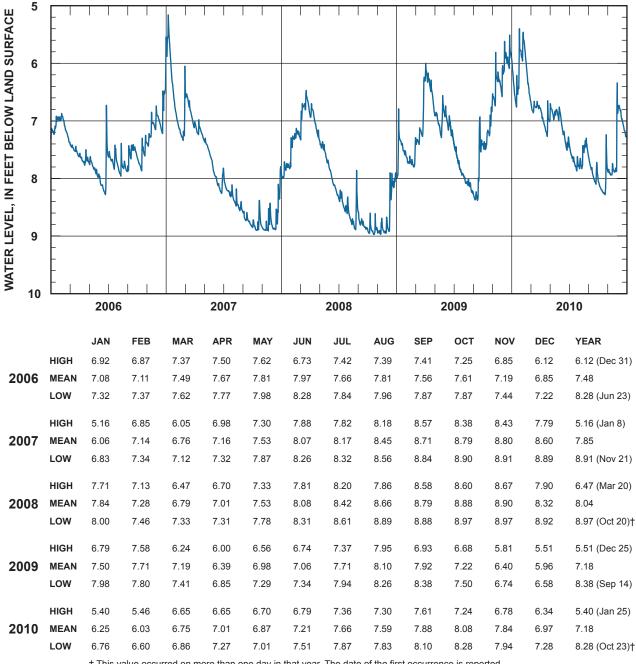
MEASURING POINT: Port in sanitary seal, 1.06 ft above land surface.

PERIOD OF RECORD: August 1997 to current year.

EXTREMES: Highest water level: 4.87 ft below land surface, September 8, 2004. Lowest water level: 8.97 ft below land surface, October 20, 2008.

REMARKS: Fractures at 96 ft and 104 ft; the latter separates granitic gneiss from amphibolite gneiss,

suggesting a significant fault displacement.



WELL NUMBER: GRV-3342 **LATITUDE:** 35° 09′ 39″ **GRID NUMBER:** 45B-d2 **LONGITUDE:** 82° 13′ 29″

LOCATION: Landrum, 1.5 miles west-southwest (Oak Grove Road Fire Station).

AQUIFER: Crystalline rock (metamorphic).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 334 ft. Open hole below 132 ft.

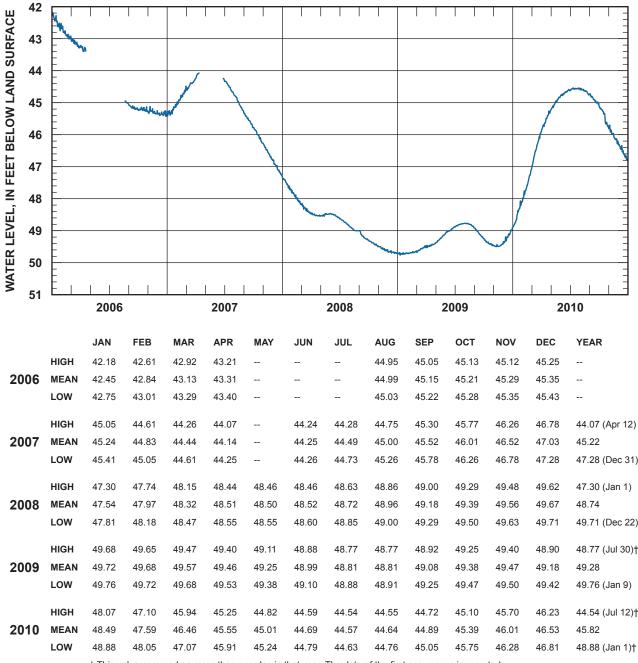
LAND SURFACE ELEVATION: 1,030.66 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: North edge of outer security box, 2.69 ft above land surface.

PERIOD OF RECORD: May 1998 to current year.

EXTREMES: Highest water level: 40.26 ft below land surface, June 30, 1998. Lowest water level: 49.76 ft below land surface, January 9, 2009.

REMARKS: No obvious fractures encountered during drilling. Water production less than 1 gpm.



WELL NUMBER: GRV-3533 **LATITUDE:** 34° 55′ 28″ **GRID NUMBER:** 48D-v9 **LONGITUDE:** 82° 26′ 40″

LOCATION: Travelers Rest, 1.5 miles south (Furman University).

AQUIFER: Crystalline rock (metamorphic).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 243 ft. Open hole below 45 ft. **LAND SURFACE ELEVATION:** 985 ft (map estimate) above National Geodetic Vertical Datum of 1929.

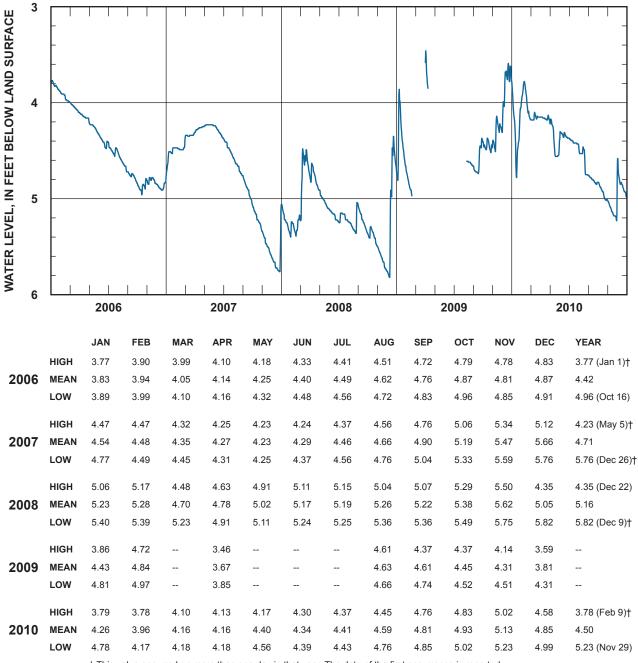
MEASURING POINT: Top of casing, 1.91 ft above land surface.

PERIOD OF RECORD: August 2002 to current year.

EXTREMES: Highest water level: 2.93 ft below land surface, August 25, 2005.

Lowest water level: 5.88 ft below land surface, October 14, 2002.

REMARKS: Bedrock depth is 40 ft.



KERSHAW COUNTY

 WELL NUMBER: KER-0263
 LATITUDE: 34° 33′ 32″

 GRID NUMBER: 241-i1
 LONGITUDE: 80° 26′ 43″

LOCATION: Bethune, 10.5 miles northwest (Mt. Pisgah Elementary School).

AQUIFER: Crystalline rock.

WELL CHARACTERISTICS: 6.25-inch diameter observation well. Depth: 455 ft. Open hole below 103 ft. **LAND SURFACE ELEVATION**: 470 ft (map estimate) above National Geodetic Vertical Datum of 1929.

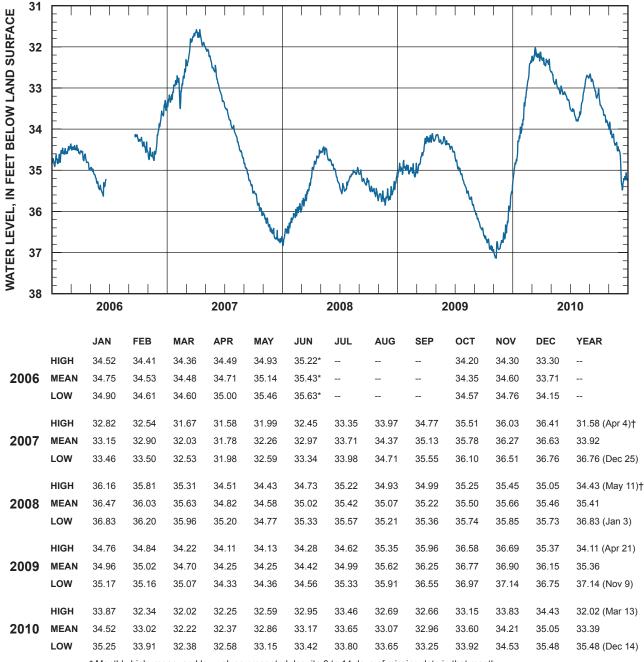
MEASURING POINT: Port in sanitary seal, 1.45 ft above land surface.

PERIOD OF RECORD: October 1993 to current year.

EXTREMES: Highest water level: 28.19 ft below land surface, April 9, 1998. Lowest water level: 39.65 ft below land surface, August 22, 2002.

REMARKS: Monitored by USGS from October 1993 until April 2003, then by DNR from August 2003 to

current year.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

LAURENS COUNTY

 WELL NUMBER: LRN-1706
 LATITUDE: 34° 34′ 15″

 GRID NUMBER: 44I-b1
 LONGITUDE: 82° 06′ 49″

LOCATION: Gray Court, 2 miles south (former Big Knob Fire Tower).

AQUIFER: Crystalline rock (metamorphic).

WELL CHARACTERISTICS: 6-inch diameter unused domestic well. Depth: 168 ft. Open interval unknown. **LAND SURFACE ELEVATION:** 840 ft (map estimate) above National Geodetic Vertical Datum of 1929.

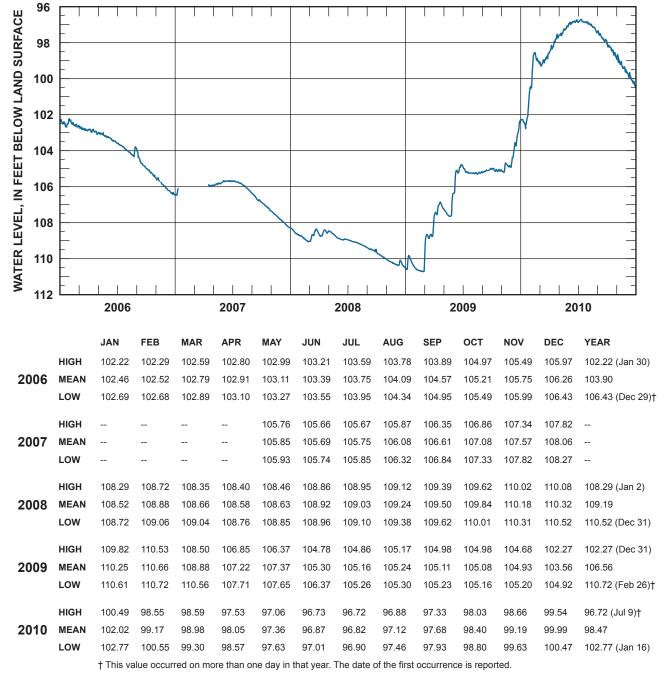
MEASURING POINT: Port in sanitary seal, 0.00 ft above land surface.

PERIOD OF RECORD: May 2001 to current year.

EXTREMES: Highest water level: 94.95 ft below land surface, September 18, 2003.

Lowest water level: 110.72 ft below land surface, February 26, 2009.

REMARKS: On the side of a prominent hill on a major fault zone.



LAURENS COUNTY

 WELL NUMBER: LRN-1707
 LATITUDE: 34° 22′ 52″

 GRID NUMBER: 43K-k1
 LONGITUDE: 82° 00′ 22″

LOCATION: Mountville, 1 mile northwest (former Mountville Fire Tower).

AQUIFER: Crystalline rock (metamorphic).

WELL CHARACTERISTICS: 6-inch diameter unused domestic well. Depth: 223 ft. Open interval unknown. **LAND SURFACE ELEVATION:** 660 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 0.75 ft above land surface.

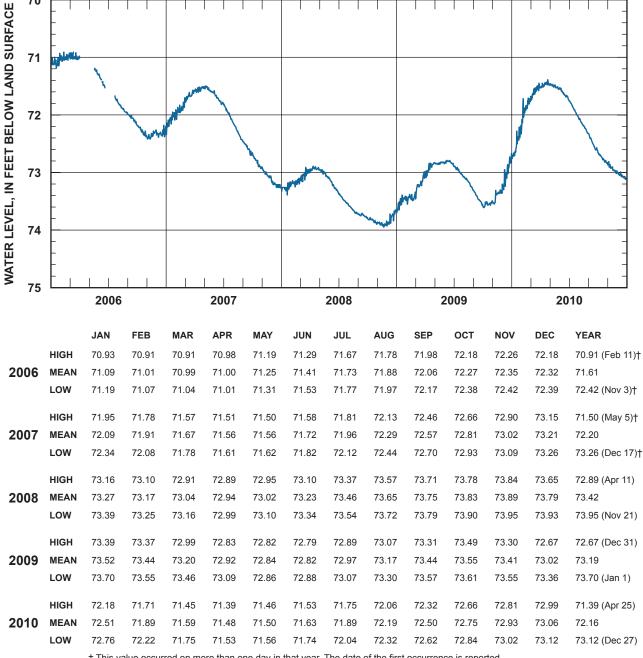
PERIOD OF RECORD: May 2001 to current year.

EXTREMES: Highest water level: 70.36 ft below land surface, June 30, 2005.

Lowest water level: 73.95 ft below land surface, November 21, 2008.

REMARKS: Local topography is flat.

70



SALUDA COUNTY

WELL NUMBER: SAL-0069 **LATITUDE**: 34° 05′ 16″ **GRID NUMBER: 39N-u3 LONGITUDE:** 81° 40′ 12″

LOCATION: Saluda, 7.5 miles northeast (Hollywood Elementary School).

AQUIFER: Crystalline rock.

8

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 480 ft. Open hole below 92 ft. LAND SURFACE ELEVATION: 445 ft (map estimate) above National Geodetic Vertical Datum of 1929.

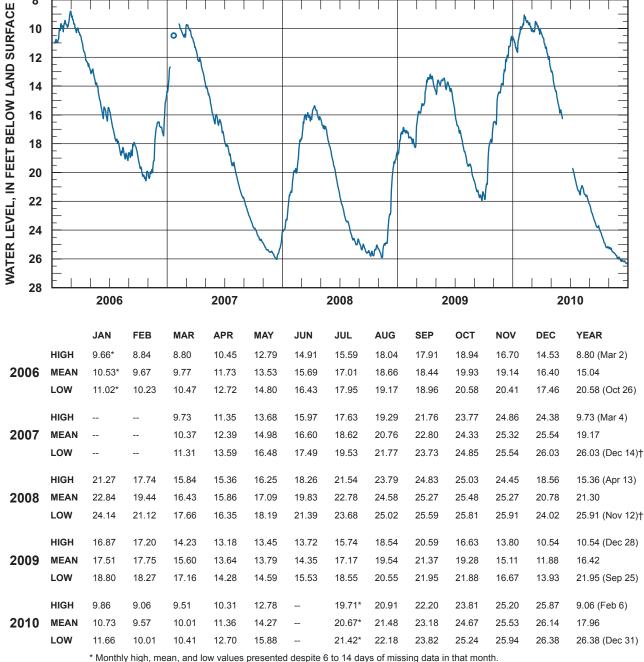
MEASURING POINT: Port in sanitary seal, 2.3 ft above land surface.

PERIOD OF RECORD: October 1993 to current year.

EXTREMES: Highest water level: 7.26 ft below land surface, April 15 and 16, 1998. Lowest water level: 26.38 ft below land surface, December 31, 2010.

REMARKS: Monitored by USGS from October 1993 until July 2003, then by DNR from August 2003 to

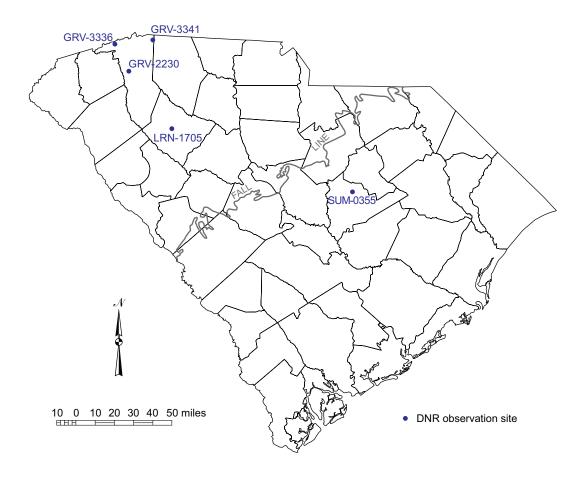
current year.



[†] This value occurred on more than one day in that year. The date of the first occurrence is reported

APPENDIX B

Ground-water levels in the shallow aquifer system, 2006–2010



WELL NUMBER: GRV-2230 **LATITUDE**: 34° 55′ 28″ **LONGITUDE**: 82° 26′ 40″ **GRID NUMBER**: 48D-v2

LOCATION: Travelers Rest, 1.5 miles south (Furman University).

AQUIFER: Shallow aquifer system (saprolite).

WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 20 ft. Open interval 5 to 20 ft. LAND SURFACE ELEVATION: 985 ft (map estimate) above National Geodetic Vertical Datum of 1929.

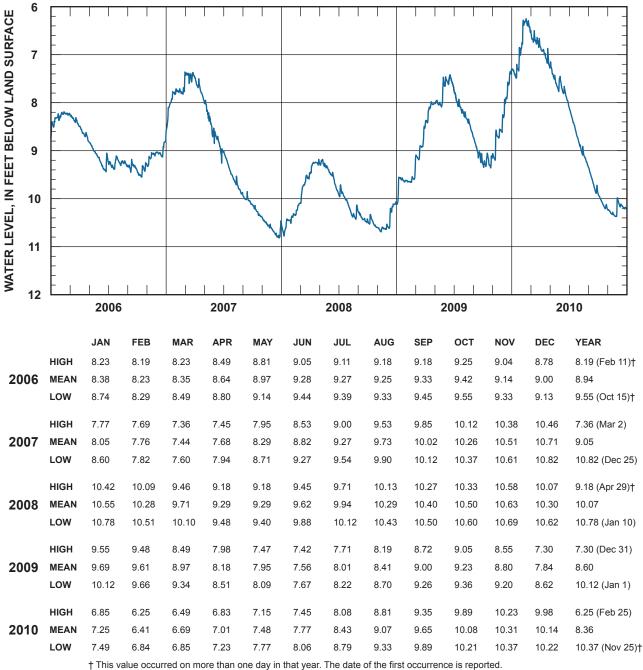
MEASURING POINT: Top of casing, 2.4 ft above land surface.

PERIOD OF RECORD: August 2002 to current year.

EXTREMES: Highest water level: 5.14 ft below land surface, June 8, 2003.

Lowest water level: 10.82 ft below land surface, December 25, 2007.

REMARKS: Rainfall also monitored at this site.



 WELL NUMBER: GRV-3336
 LATITUDE: 35° 07′ 30″

 GRID NUMBER: 49B-05
 LONGITUDE: 82° 34′ 25″

LOCATION: Marietta, 7 miles north-northwest (Jones Gap State Park).

AQUIFER: Shallow aquifer system (saprolite).

7

WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 20 ft. Screened from 14 to 19 ft,

with filter sand from 12 to 19 ft.

LAND SURFACE ELEVATION: 1,353.32 ft above National Geodetic Vertical Datum of 1929.

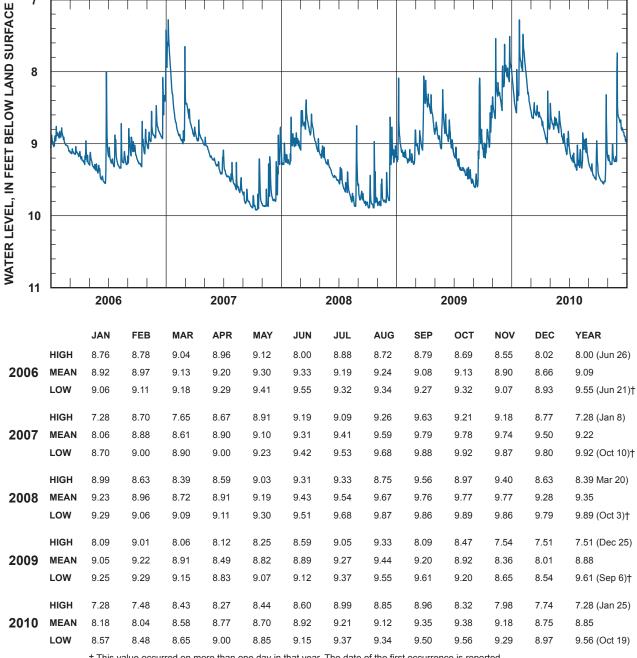
MEASURING POINT: Port in sanitary seal, 2.08 ft above land surface.

PERIOD OF RECORD: August 1997 to current year.

EXTREMES: Highest water level: 6.17 ft below land surface, September 8, 2004.

Lowest water level: 10.03 ft below land surface, September 12, 2002.

REMARKS: The saprolite at this site underlies blocks of granitic gneiss, probably placed during the construction of the adjacent roadbed. Water level may be influenced by Middle Saluda River.



 WELL NUMBER: GRV-3341
 LATITUDE: 35° 09′ 39″

 GRID NUMBER: 45B-d1
 LONGITUDE: 82° 13′ 29″

LOCATION: Landrum, 1.5 miles west-southwest (Oak Grove Road Fire Station).

AQUIFER: Shallow aquifer system (saprolite).

WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 80 ft. Screened from 70 to 80 ft,

with filter sand from 50 to 80 ft.

LAND SURFACE ELEVATION: 1,030.66 ft above National Geodetic Vertical Datum of 1929.

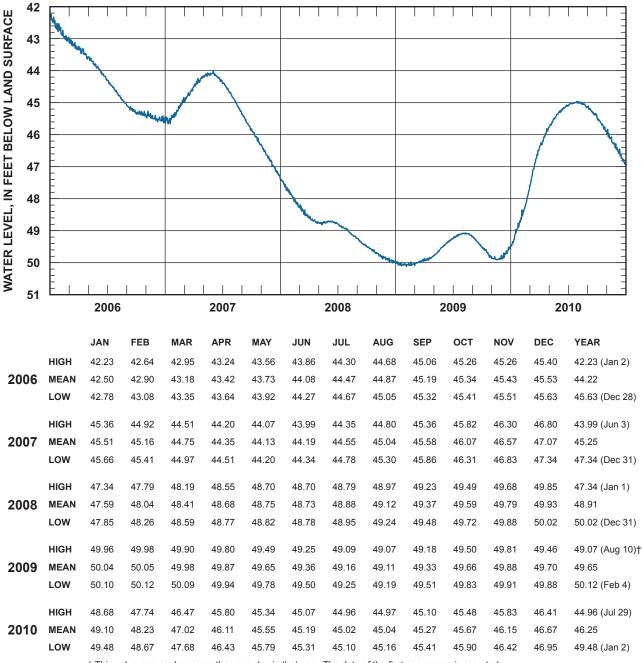
MEASURING POINT: Port in sanitary seal, 2.72 ft above land surface.

PERIOD OF RECORD: May 1998 to current year.

EXTREMES: Highest water level: 40.17 ft below land surface, June 30, 1998.

Lowest water level: 50.12 ft below land surface, February 4, 2009.

REMARKS: Total saprolite thickness is 132 ft.



LAURENS COUNTY

WELL NUMBER: LRN-1705 **LATITUDE**: 34° 29′ 27″ GRID NUMBER: 43J-c2 **LONGITUDE:** 82° 02′ 34″

LOCATION: Laurens (Joe R. Adair Outdoor Education Center). AQUIFER: Shallow aguifer system (Quaternary alluvium).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 39 ft. Screened from 29 to 39 ft.

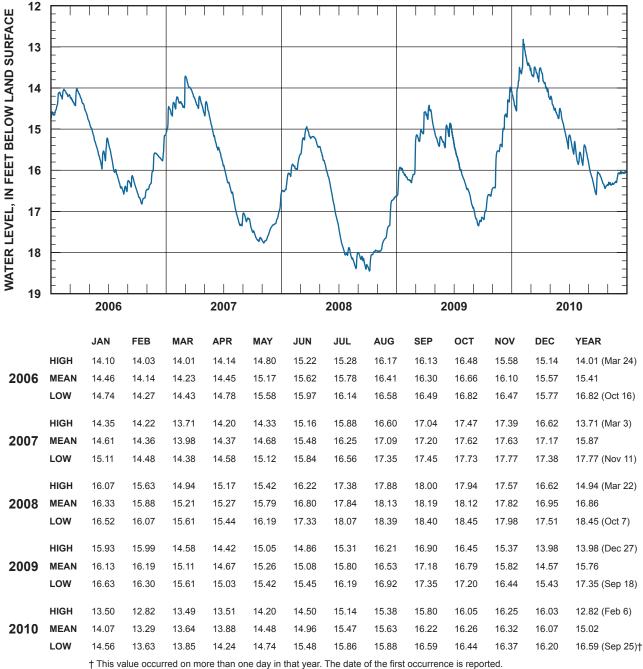
LAND SURFACE ELEVATION: 635.73 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of instrument platform, 2.82 ft above land surface.

PERIOD OF RECORD: August 2000 to current year.

EXTREMES: Highest water level: 10.76 ft below land surface, May 23, 2003. Lowest water level: 18.45 ft below land surface, October 7, 2008.

REMARKS: Screened in bed of well-sorted sand that is at least 40 ft thick.



SUMTER COUNTY

 WELL NUMBER: SUM-0355
 LATITUDE: 34° 00′ 59″

 GRID NUMBER: 230-y3
 LONGITUDE: 80° 24′ 08″

LOCATION: Dalzell (Ebenezer Elementary School). **AQUIFER:** Shallow aquifer system (Quaternary alluvium).

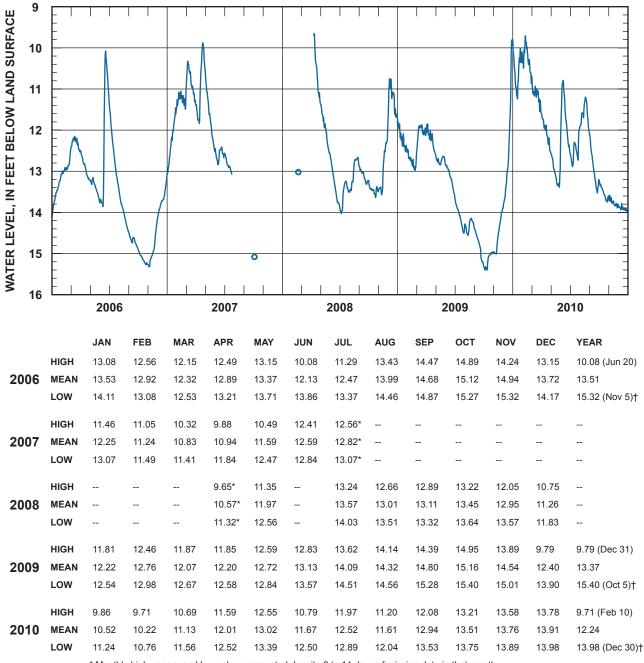
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 47 ft. Open interval unknown. **LAND SURFACE ELEVATION:** 190 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of sanitary seal, 1.25 ft above land surface.

PERIOD OF RECORD: August 2003 to current year.

EXTREMES: Highest water level: 9.47 ft below land surface, August 16, 2003. Lowest water level: 15.40 ft below land surface, October 5, 2009.

REMARKS: Well may be partially screened in subcrop of Black Creek aquifer.

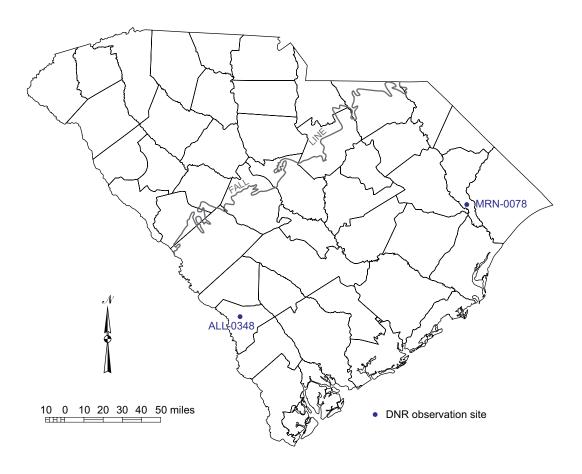


^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

APPENDIX C

Ground-water levels in the Cape Fear aquifer, 2006–2010



ALLENDALE COUNTY

WELL NUMBER: ALL-0348 **GRID NUMBER:** 35AA-q3 **LATITUDE:** 33° 01′ 30″ **LONGITUDE:** 81° 23′ 05″

LOCATION: Allendale, 3.5 miles west (County Road 52).

AQUIFER: Cape Fear (Gramling confining unit).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 1,605 ft. Screened from 1,575 to

1,600 ft.

LAND SURFACE ELEVATION: 281.0 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.80 ft above land surface.

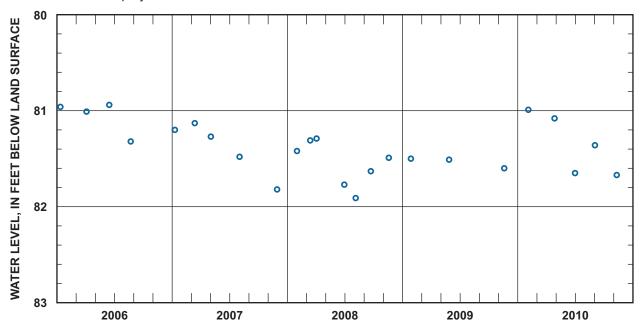
PERIOD OF RECORD: October 1996 to current year.

EXTREMES: Highest water level: 79.05 ft below land surface, February 5, 1998.

Lowest water level: 81.91 ft below land surface, August 4, 2008.

REMARKS: Well-cluster site C-10. One of nine wells drilled on site for Department of Energy and

DNR project.



MARION COUNTY

WELL NUMBER: MRN-0078 **LATITUDE:** 33° 51′ 42″ **GRID NUMBER:** 10Q-p2 **LONGITUDE:** 79° 19′ 49″

LOCATION: Brittons Neck, 3 miles south (former Brittons Neck Fire Tower).

AQUIFER: Cape Fear (Gramling).

WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 1,038 ft. Screened from 1,008 to

1,028 ft.

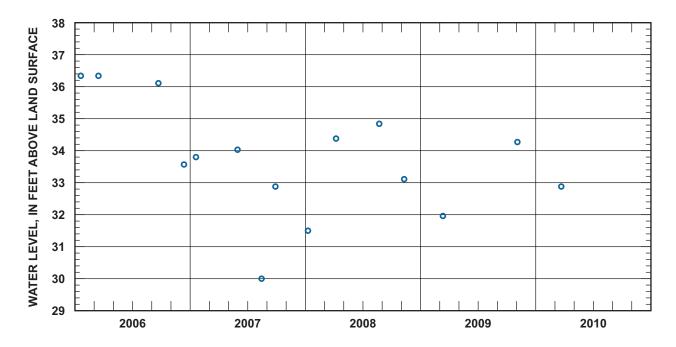
LAND SURFACE ELEVATION: 34.63 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of blind flange, 2.89 ft above land surface.

PERIOD OF RECORD: August 1999 to current year.

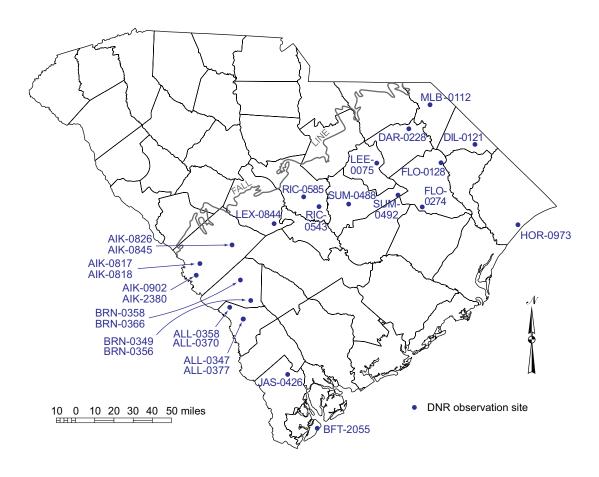
EXTREMES: Highest water level: 43.02 ft above land surface, March 30, 2001. Lowest water level: 30.00 ft above land surface, August 15, 2007.

REMARKS:



APPENDIX D

Ground-water levels in the Middendorf aquifer, 2006–2010



AIKEN COUNTY

WELL NUMBER: AIK-0817 **LATITUDE:** 33° 26′ 16″ **GRID NUMBER:** 40V-s2 **LONGITUDE:** 81° 46′ 13″

LOCATION: New Ellenton, 4 miles west-southwest (County Road 146).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 535 ft. Screened from 520 to 530 ft.

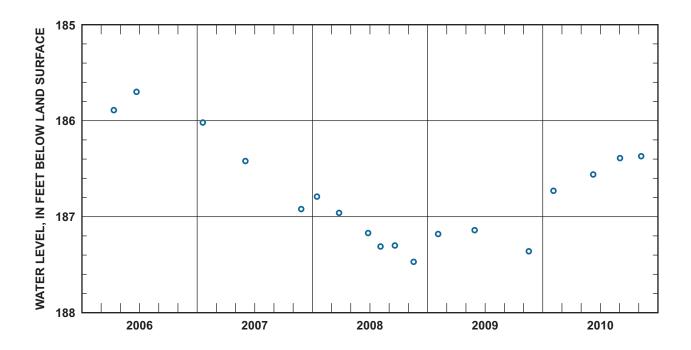
LAND SURFACE ELEVATION: 419.0 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.94 ft above land surface.

PERIOD OF RECORD: April 1998 to current year.

EXTREMES: Highest water level: 179.65 ft below land surface, February 2, 1999. Lowest water level: 187.47 ft below land surface, November 17, 2008.

REMARKS: Well-cluster site C-2. One of five wells drilled on site for Department of Energy and DNR project.



 WELL NUMBER: AIK-0818
 LATITUDE: 33° 26′ 16″

 GRID NUMBER: 40V-s3
 LONGITUDE: 81° 46′ 13″

LOCATION: New Ellenton, 4 miles west-southwest (County Road 146).

AQUIFER: Middendorf (McQueen Branch).

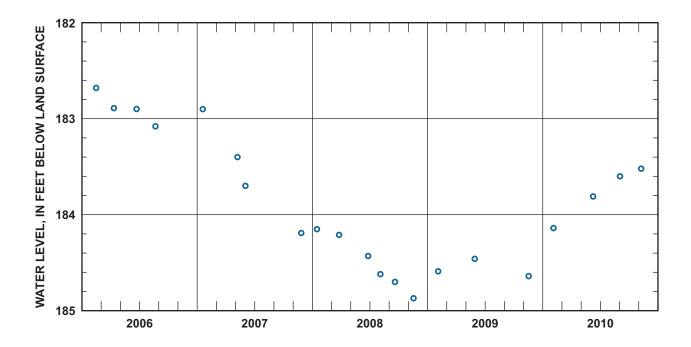
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 425 ft. Screened from 410 to 420 ft.

LAND SURFACE ELEVATION: 418.3 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 3.06 ft above land surface.

PERIOD OF RECORD: April 1988 to current year.

EXTREMES: Highest water level: 176.56 ft below land surface, December 28, 1995. Lowest water level: 184.87 ft below land surface, November 17, 2008.



 WELL NUMBER: AIK-0826
 LATITUDE: 33° 32′ 33″

 GRID NUMBER: 36U-o1
 LONGITUDE: 81° 29′ 09″

LOCATION: Windsor, 4 miles north-northeast (Aiken State Park).

AQUIFER: Middendorf (McQueen Branch).

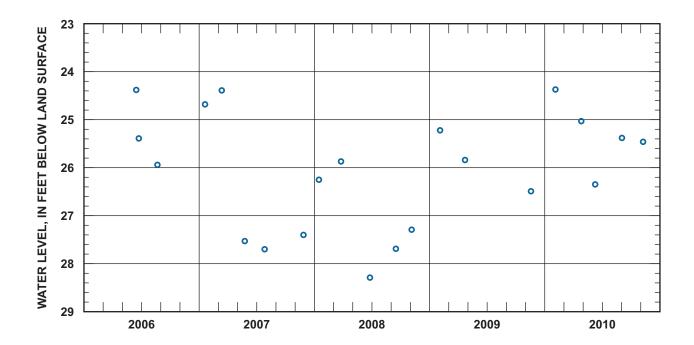
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 500 ft. Screened from 485 to 495 ft.

LAND SURFACE ELEVATION: 294.9 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.80 ft above land surface.

PERIOD OF RECORD: October 1989 to current year.

EXTREMES: Highest water level: 17.89 ft below land surface, March 19, 1996. Lowest water level: 28.29 ft below land surface, June 26, 2008.



WELL NUMBER: AIK-0845 **GRID NUMBER:** 36U-o2 **LATITUDE:** 33° 32′ 33″ **LONGITUDE:** 81° 29′ 08″

LOCATION: Windsor, 4 miles north-northeast (Aiken State Park).

AQUIFER: Middendorf (McQueen Branch).

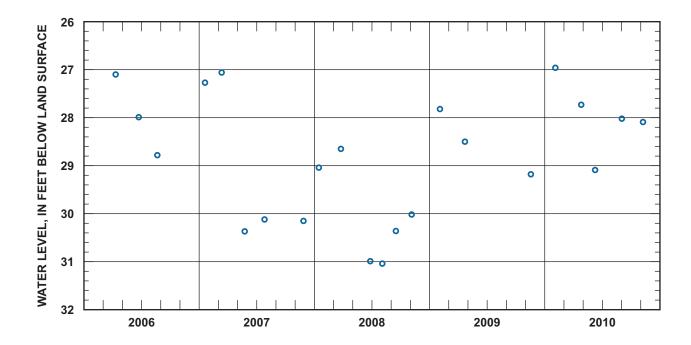
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 356 ft. Screened from 341 to 351 ft.

LAND SURFACE ELEVATION: 296.9 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.88 ft above land surface.

PERIOD OF RECORD: May 1993 to current year.

EXTREMES: Highest water level: 20.02 ft below land surface, March 19, 1996. Lowest water level: 31.04 ft below land surface, August 4, 2008.



WELL NUMBER: AIK-0902 **LATITUDE:** 33° 21′ 13″ **CRID NUMBER:** 40W-q1 **LONGITUDE:** 81° 48′ 32″

LOCATION: Jackson, 1 mile northwest (S.C. Highway 125).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 511 ft. Screened from 496 to 506 ft.

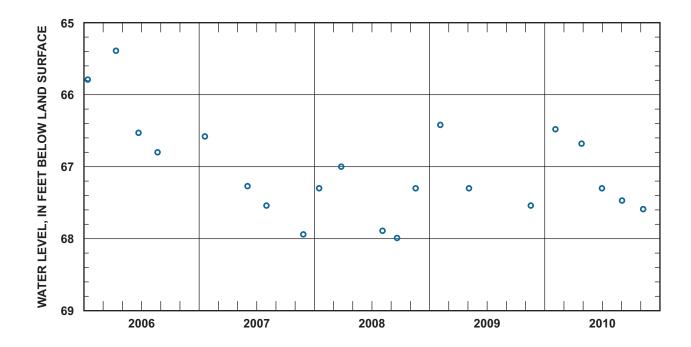
LAND SURFACE ELEVATION: 231.87 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.70 ft above land surface.

PERIOD OF RECORD: January 2006 to current year.

EXTREMES: Highest water level: 65.39 ft below land surface, April 12, 2006.

Lowest water level: 67.99 ft below land surface, September 19, 2008.



WELL NUMBER: AIK-2380 **LATITUDE:** 33° 21′ 12″ **GRID NUMBER:** 40W-q4 **LONGITUDE:** 81° 48′ 32″

LOCATION: Jackson, 1 mile northwest (S.C. Highway 125).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 385 ft. Screened from 370 to 380 ft.

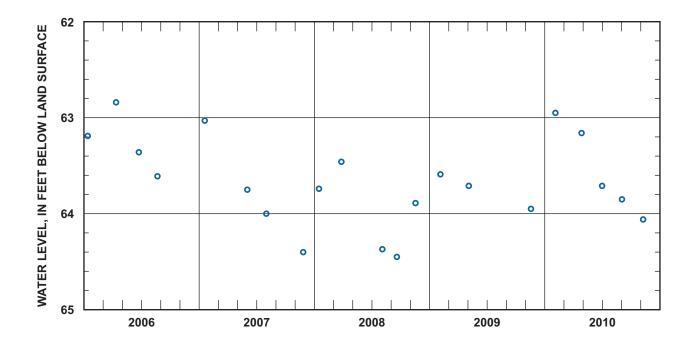
LAND SURFACE ELEVATION: 228.25 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.29 ft above land surface.

PERIOD OF RECORD: December 1995 to current year.

EXTREMES: Highest water level: 59.08 ft below land surface datum, April 2, 1996.

Lowest water level: 64.45 ft below land surface datum, September 19, 2008.



WELL NUMBER: ALL-0347 **LATITUDE:** 33° 01′ 29″ **GRID NUMBER:** 35AA-q2 **LONGITUDE:** 81° 23′ 03″

LOCATION: Allendale, 3.5 miles west (County Road 52).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 1,423 ft. Screened from 1,408

to 1,418 ft.

LAND SURFACE ELEVATION: 281.8 ft above National Geodetic Vertical Datum of 1929.

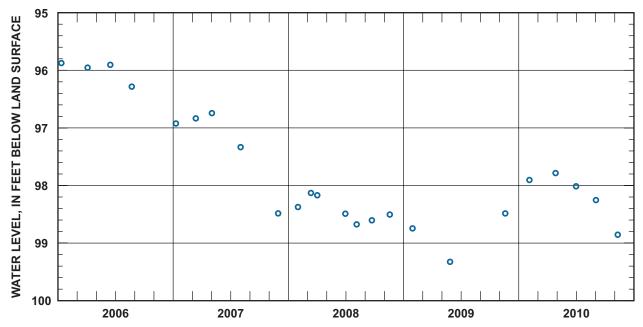
MEASURING POINT: Port in sanitary seal, 2.25 ft above land surface.

PERIOD OF RECORD: October 1996 to current year.

EXTREMES: Highest water level: 88.20 ft below land surface datum, March 14, 1997.

Lowest water level: 99.32 ft below land surface datum, May 27, 2009.

REMARKS: Well-cluster site C-10. One of nine wells drilled on site for Department of Energy and



 WELL NUMBER: ALL-0358
 LATITUDE: 33° 06′ 48″

 GRID NUMBER: 37Z-t3
 LONGITUDE: 81° 30′ 22″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter test well. Depth: 1,123 ft. Screened from 1,108 to 1,118 ft.

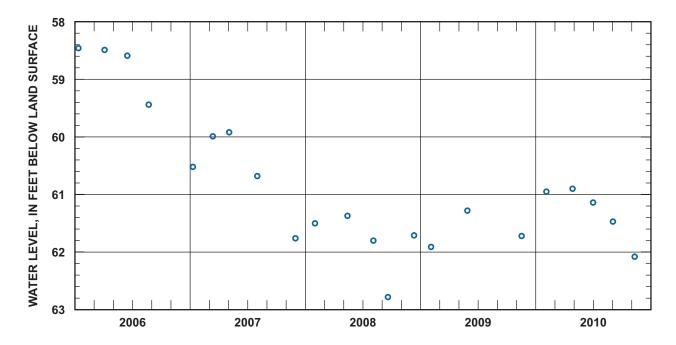
LAND SURFACE ELEVATION: 243.12 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.00 ft above land surface.

PERIOD OF RECORD: November 1995 to current year.

EXTREMES: Highest water level: 52.57 ft below land surface datum, March 19, 1996. Lowest water level: 62.78 ft below land surface datum, September 19, 2008.

REMARKS: Well-cluster site C-7. One of nine wells drilled on site for Department of Energy and



WELL NUMBER: ALL-0370 **LATITUDE:** 33° 06′ 48″ **GRID NUMBER:** 37Z-t11 **LONGITUDE:** 81° 30′ 21″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Middendorf (McQueen Branch).

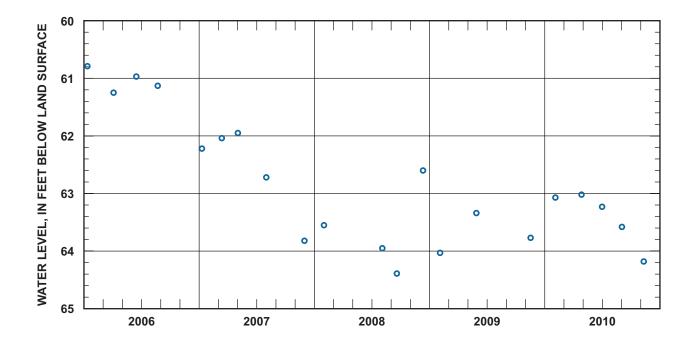
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 975 ft. Screened from 960 to 970 ft.

LAND SURFACE ELEVATION: 245.12 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.41 ft above land surface.

PERIOD OF RECORD: January 2006 to current year.

EXTREMES: Highest water level: 60.79 ft below land surface, January 12, 2006. Lowest water level: 64.39 ft below land surface, September 19, 2008.



WELL NUMBER: ALL-0377 **LATITUDE:** 33° 01′ 29″ **GRID NUMBER:** 35AA-q10 **LONGITUDE:** 81° 23′ 04″

LOCATION: Allendale, 3.5 miles west (County Road 52).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 1,199 ft. Screened from 1,174 to

1,194 ft.

LAND SURFACE ELEVATION: 281.52 ft above National Geodetic Vertical Datum of 1929.

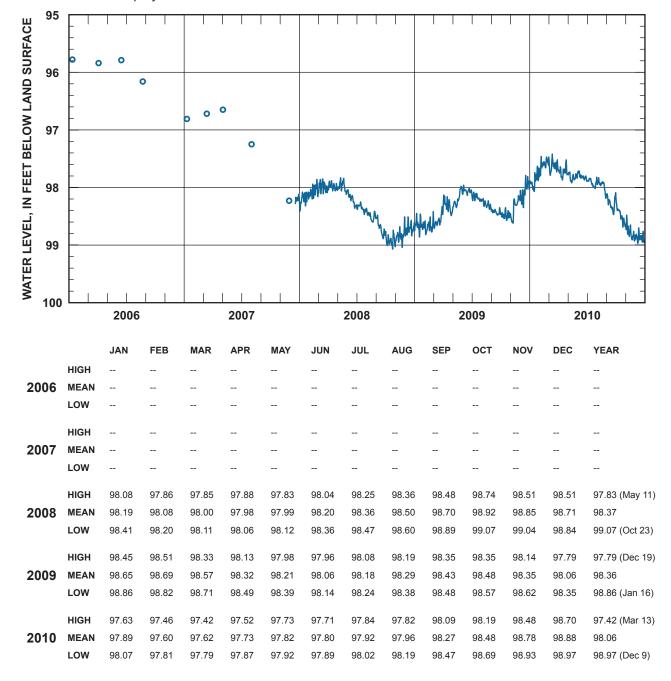
MEASURING POINT: Port in sanitary seal, 3.52 ft above land surface.

PERIOD OF RECORD: October 1996 to current year.

EXTREMES: Highest water level: 87.94 ft below land surface, April 18, 1997.

Lowest water level: 99.07 ft below land surface, October 23, 2008.

REMARKS: Well-cluster site C-10. One of nine wells drilled on site for Department of Energy and



WELL NUMBER: BRN-0349 **LATITUDE**: 33° 10′ 43″ **LONGITUDE:** 81° 18′ 52″ **GRID NUMBER:** 34Y-x1

LOCATION: Barnwell, 4 miles southeast (S.C. Highway 300).

AQUIFER: Middendorf (McQueen Branch).

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WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 1,045 ft. Screened from 1,030

to 1,040 ft.

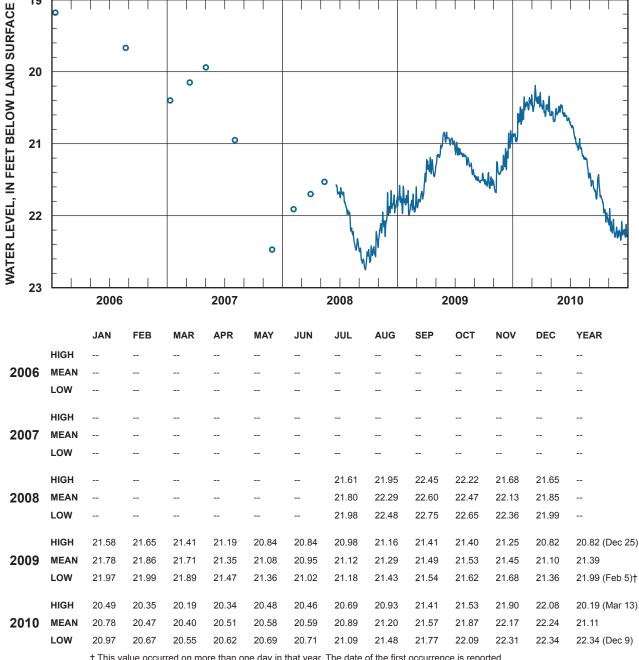
LAND SURFACE ELEVATION: 208.6 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 3.33 ft above land surface.

PERIOD OF RECORD: April 1988 to current year.

EXTREMES: Highest water level: 9.59 ft below land surface, May 13, 1993.

Lowest water level: 22.76 ft below land surface, September 22, 2008.



 WELL NUMBER: BRN-0356
 LATITUDE: 33° 10′ 44″

 GRID NUMBER: 34Y-x8
 LONGITUDE: 81° 18′ 52″

LOCATION: Barnwell, 4 miles southeast (S.C. Highway 300).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 929 ft. Screened from 914 to 924 ft.

LAND SURFACE ELEVATION: 208.6 ft above National Geodetic Vertical Datum of 1929.

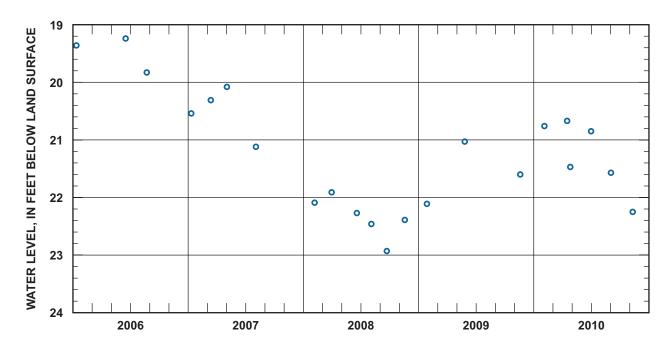
MEASURING POINT: Port in sanitary seal, 2.47 ft above land surface.

PERIOD OF RECORD: November 1989 to current year.

EXTREMES: Highest water level: 9.76 ft below land surface, May 13, 1993.

Lowest water level: 22.93 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-6. One of eight wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0358
 LATITUDE: 33° 19′ 17″

 GRID NUMBER: 35X-e2
 LONGITUDE: 81° 24′ 25″

LOCATION: Williston, 3.5 miles south. **AQUIFER:** Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 847 ft. Screened from 832 to 842 ft.

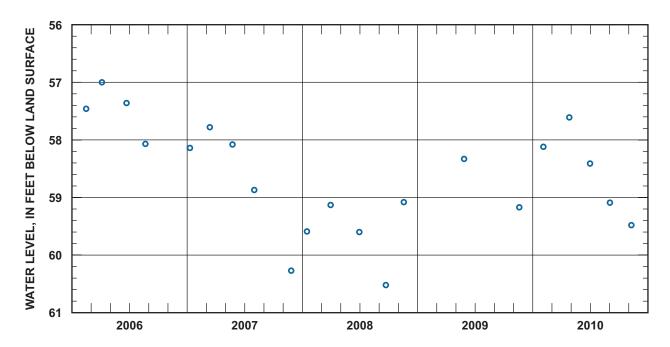
LAND SURFACE ELEVATION: 265.6 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.00 ft above land surface.

PERIOD OF RECORD: May 1993 to current year.

EXTREMES: Highest water level: 49.76 ft below land surface, March 19, 1996. Lowest water level: 60.52 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-5. One of seven wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0366
 LATITUDE: 33° 19′ 17″

 GRID NUMBER: 35X-e6
 LONGITUDE: 81° 24′ 25″

LOCATION: Williston, 3.5 miles south. **AQUIFER:** Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 715 ft. Screened from 700 to 710 ft.

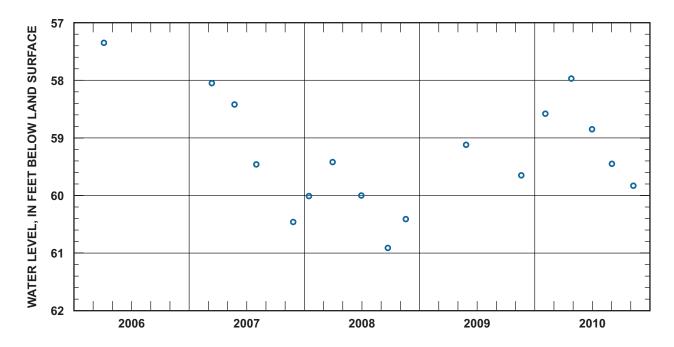
LAND SURFACE ELEVATION: 266.7 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 3.00 ft above land surface.

PERIOD OF RECORD: May 1993 to current year.

EXTREMES: Highest water level: 49.89 ft below land surface, March 19, 1996. Lowest water level: 60.91 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-5. One of seven wells drilled on site for Department of Energy and



BEAUFORT COUNTY

 WELL NUMBER: BFT-2055
 LATITUDE: 32° 11′ 29″

 GRID NUMBER: 27KK-r14
 LONGITUDE: 80° 42′ 14″

LOCATION: Hilton Head Island (near Singleton Beach).

AQUIFER: Middendorf and Cape Fear (Charleston and Gramling).

WELL CHARACTERISTICS: 8-inch diameter test well. Depth: 3,708 ft. Screened from 2,782 to 3,688 ft.

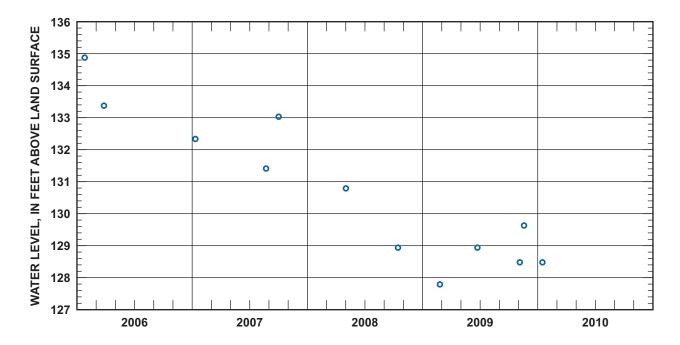
LAND SURFACE ELEVATION: 12.14 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Top of 8-inch blind flange, 3.90 ft above concrete pad at land surface.

PERIOD OF RECORD: April 2000 to current year.

EXTREMES: Highest water level: 153.05 ft above land surface datum, April 1, 2000. Lowest water level: 127.79 ft above land surface datum, February 24, 2009.

REMARKS: Flowing well measured with 0-100 psi gage. Middendorf-Cape Fear well at south end of

island began pumping in late 2001.



DARLINGTON COUNTY

WELL NUMBER: DAR-0228 **LATITUDE**: 34° 27′ 32″ **GRID NUMBER:** 17J-m1 **LONGITUDE**: 79° 52′ 48″

LOCATION: Society Hill, 3 miles south-southwest (Lake Darpo).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 186 ft. Screened from 175 to 185 ft.

LAND SURFACE ELEVATION: 170 ft (estimate) above National Geodetic Vertical Datum of 1929.

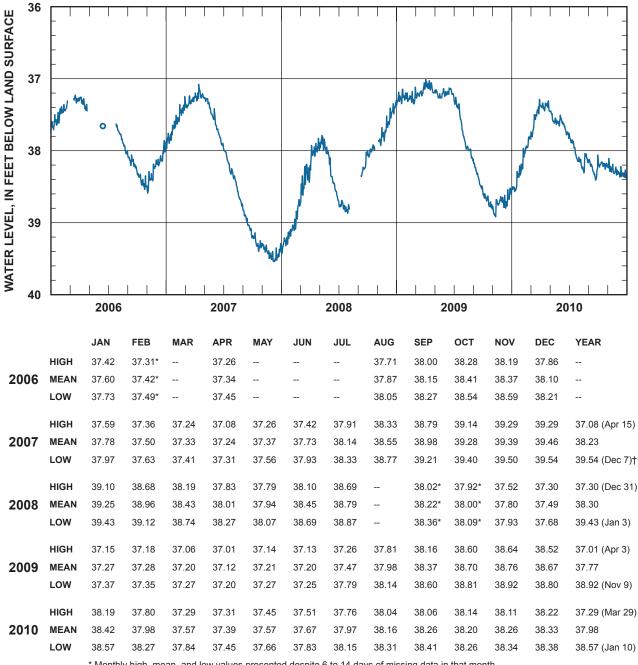
MEASURING POINT: Port in base of enclosure, 1.70 ft above land surface.

PERIOD OF RECORD: November 1999 to current year.

EXTREMES: Highest water level: 36.30 ft below land surface, April 25, 2000.

Lowest water level: 40.57 ft below land surface, September 30, 2002.

REMARKS: Drilled and cored for DNR/USGS Pee Dee region ground-water study.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

DILLON COUNTY

WELL NUMBER: DIL-0121 **LATITUDE**: 34° 19′ 42″ **GRID NUMBER: 10L-b1 LONGITUDE**: 79° 16′ 59″

LOCATION: Dillon, 6.5 miles southeast (Little Pee Dee State Park).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 294 ft. Screened from 269 to 284 ft. LAND SURFACE ELEVATION: 95 ft (map estimate) above National Geodetic Vertical Datum of 1929.

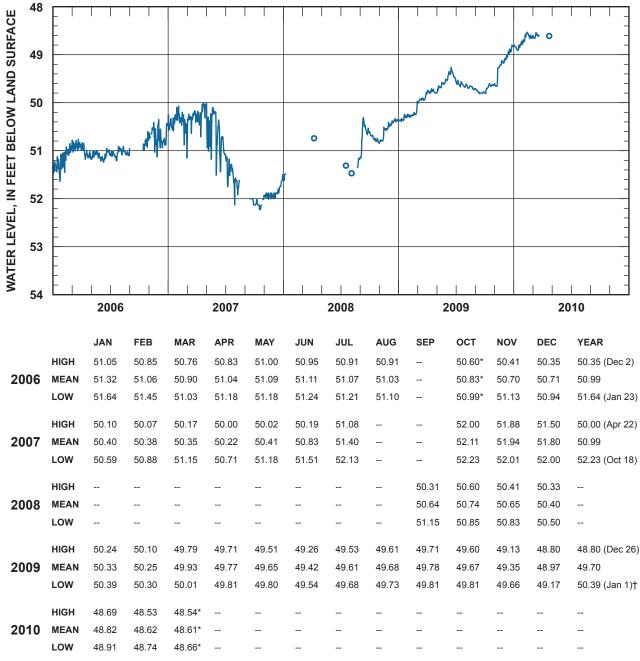
MEASURING POINT: Port in base of enclosure, 2.98 ft above land surface.

PERIOD OF RECORD: December 1999 to current year.

EXTREMES: Highest water level: 42.19 ft below land surface, January 30, 2000.

Lowest water level: 53.50 ft below land surface, November 11, 2004.

REMARKS: Drilled and cored for DNR/USGS aguifer delineation project.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

FLORENCE COUNTY

 WELL NUMBER: FLO-0128
 LATITUDE: 34° 11′ 44″

 GRID NUMBER: 13M-p3
 LONGITUDE: 79° 34′ 49″

LOCATION: Florence, 9.5 miles east (E.I. Dupont de Nemours Co.).

AQUIFER: Middendorf and Cape Fear (McQueen Branch and Gramling confining unit).

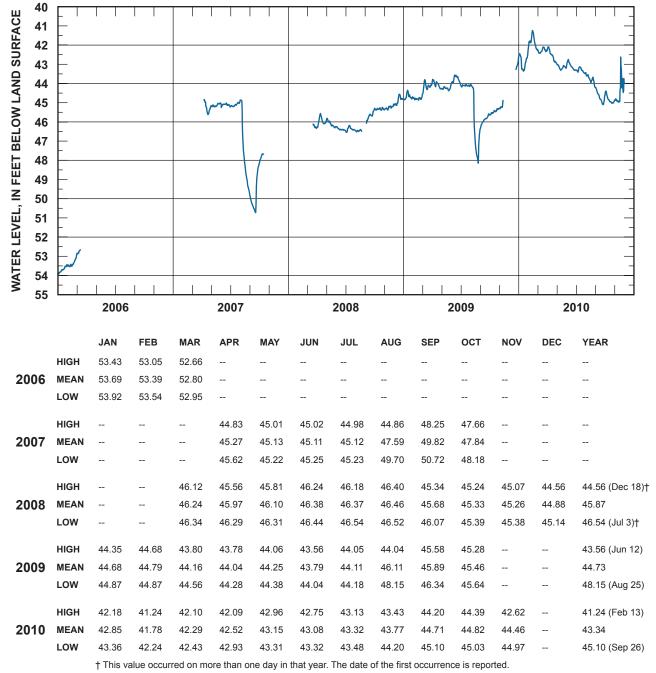
WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 695 ft. Screened from 265 to 690 ft. **LAND SURFACE ELEVATION:** 96 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of sanitary seal, 2.75 ft above land surface.

PERIOD OF RECORD: January 1982 to current year.

EXTREMES: Highest water level: 41.24 ft below land surface, February 13, 2010. Lowest water level: 92.07 ft below land surface, August 16, 1999.

REMARKS: Monitored by USGS from January 1982 until November 2009, then by DNR to current year.



FLORENCE COUNTY

 WELL NUMBER: FLO-0274
 LATITUDE: 33° 51′ 21″

 GRID NUMBER: 16Q-s1
 LONGITUDE: 79° 46′ 00″

LOCATION: Lake City (Lake City Airport). **AQUIFER:** Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 560 ft. Screened from 540 to 560 ft.

LAND SURFACE ELEVATION: 78.53 ft above National Geodetic Vertical Datum of 1929.

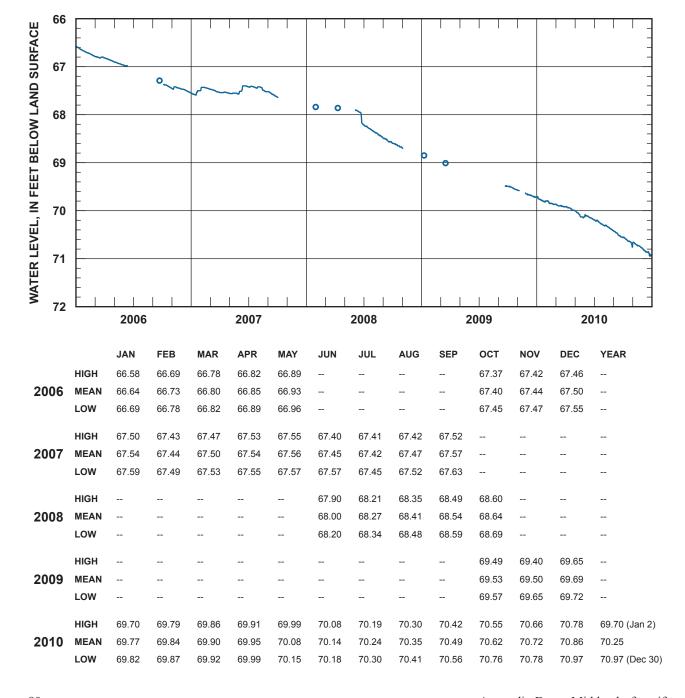
MEASURING POINT: Port in base of enclosure, 1.34 ft above land surface.

PERIOD OF RECORD: September 2000 to current year.

EXTREMES: Highest water level: 58.61 ft below land surface, March 23, 2001. Lowest water level: 70.97 ft below land surface, December 30, 2010.

REMARKS: Drilled and cored for DNR/USGS Pee Dee region ground-water study. Possible collapsed

well screen.



HORRY COUNTY

 WELL NUMBER: HOR-0973
 LATITUDE: 33° 43′ 23″

 GRID NUMBER: 5S-f1
 LONGITUDE: 78° 54′ 12″

LOCATION: Myrtle Beach (Myrtle Beach Surface Water Treatment Plant).

AQUIFER: Middendorf and Cape Fear (Gramling).

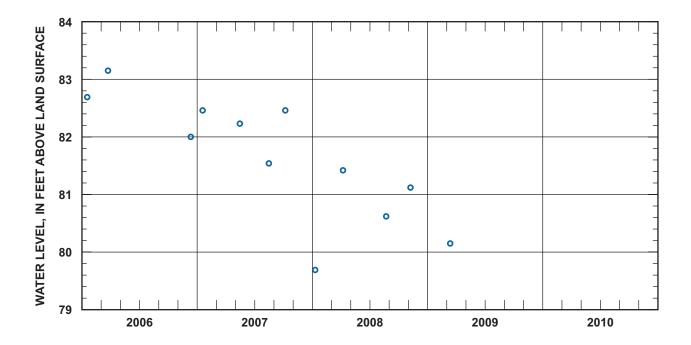
WELL CHARACTERISTICS: 14-inch diameter test well. Depth: 1,331 ft. Screened from 1,012 to 1,328 ft. **LAND SURFACE ELEVATION:** 20 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of 12-inch flange, 3.37 ft above concrete pad at land surface.

PERIOD OF RECORD: August 1999 to current year.

EXTREMES: Highest water level: 85.69 ft above land surface, November 4, 1999. Lowest water level: 79.69 ft above land surface, January 10, 2008.

REMARKS:



JASPER COUNTY

WELL NUMBER: JAS-0426 **LATITUDE:** 32° 37′ 06″ **GRID NUMBER:** 30FF-02 **LONGITUDE:** 80° 59′ 43″

LOCATION: Ridgeland, 9 miles north-northwest (U.S. Highway 278).

AQUIFER: Middendorf (Charleston).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 1,994 ft. Screened from 1,949 to

1,994 ft.

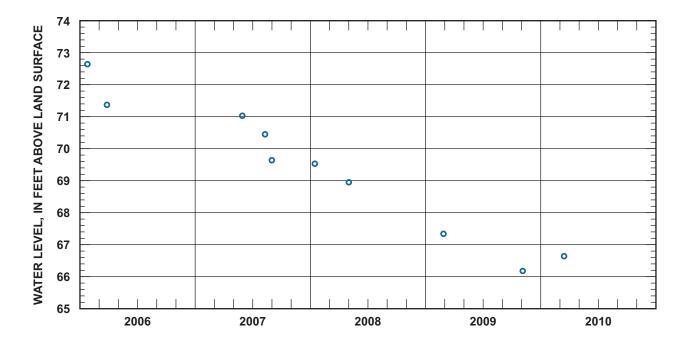
LAND SURFACE ELEVATION: 63.20 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Top of well-head blind flange, 2.74 ft above concrete pad at land surface.

PERIOD OF RECORD: April 2000 to current year.

EXTREMES: Highest water level: 79.56 ft above land surface, April 17, 2000.

Lowest water level: 66.18 ft above land surface, November 4, 2009.

REMARKS: One of two wells drilled for U.S. Department of Energy and DNR project.



LEE COUNTY

WELL NUMBER: LEE-0075 LATITUDE: 34° 12′ 09″ **LONGITUDE:** 80° 10′ 30″ **GRID NUMBER:** 21M-k1

LOCATION: Bishopville, 3.5 miles east-southeast (Lee State Park).

AQUIFER: Middendorf (McQueen Branch).

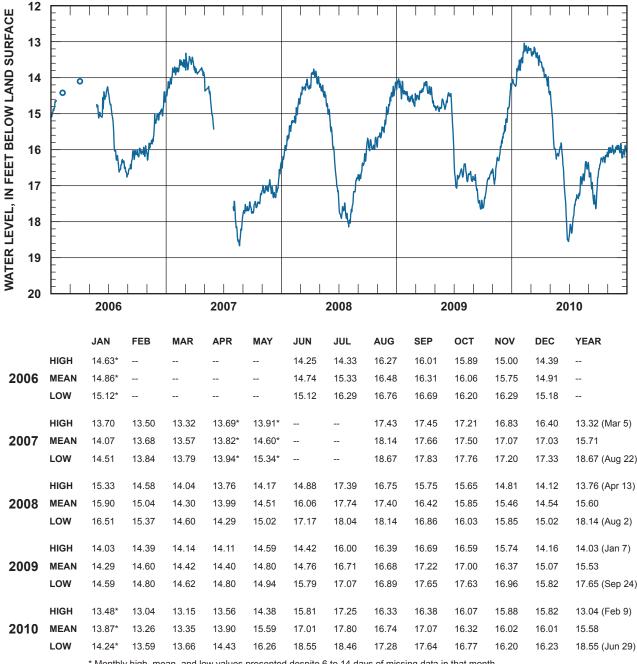
WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 356 ft. Screened from 306 to 356 ft. LAND SURFACE ELEVATION: 195 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 3.55 ft above land surface.

PERIOD OF RECORD: December 1999 to current year.

EXTREMES: Highest water level: 12.52 ft below land surface, April 2, 2005. Lowest water level: 19.05 ft below land surface, August 10, 2002.

REMARKS: Drilled and cored for DNR/USGS aguifer delineation project.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

LEXINGTON COUNTY

 WELL NUMBER: LEX-0844
 LATITUDE: 33° 44′ 46″

 GRID NUMBER: 32S-b4
 LONGITUDE: 81° 06′ 27″

LOCATION: Swansea (Swansea High School Freshman Academy).

AQUIFER: Middendorf (McQueen Branch).

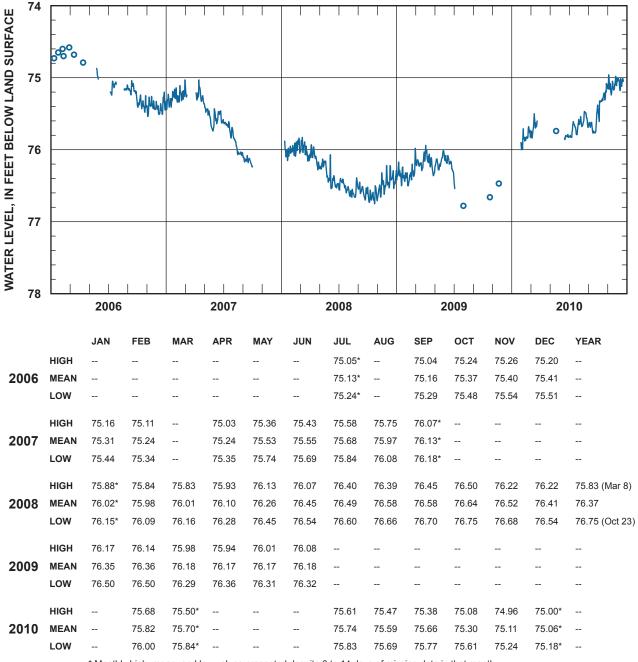
WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 522 ft. Screened from 392 to 502 ft. **LAND SURFACE ELEVATION:** 360 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 3.35 ft above land surface.

PERIOD OF RECORD: October 1999 to current year.

EXTREMES: Highest water level: 69.02 ft below land surface, November 15, 1999. Lowest water level: 76.75 ft below land surface, October 23, 2008.

REMARKS: Drilled and cored for DNR/USGS aguifer delineation project.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

MARLBORO COUNTY

 WELL NUMBER: MLB-0112
 LATITUDE: 34° 37′ 34″

 GRID NUMBER: 15H-I2
 LONGITUDE: 79° 41′ 21″

LOCATION: Bennettsville (Marlboro County Recreation Department Building).

AQUIFER: Middendorf and Cape Fear (McQueen Branch and Gramling confining unit).

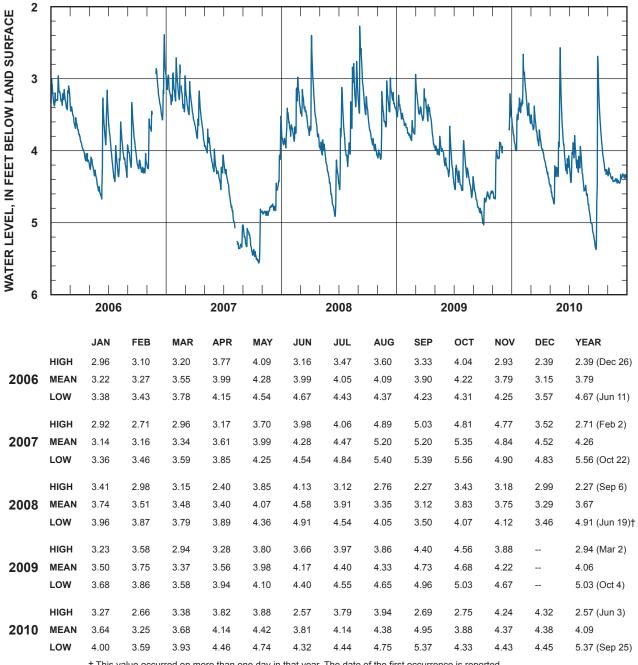
WELL CHARACTERISTICS: 8-inch diameter observation well. Depth: 345 ft. Screened from 220 to 335 ft. **LAND SURFACE ELEVATION:** 135 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of plywood instrument support, 1.26 ft above land surface.

PERIOD OF RECORD: January 1972 to current year.

EXTREMES: Highest water level: 0.895 ft below land surface, February 25, 1979. Lowest water level: 5.79 ft below land surface, August 13, 2002.

REMARKS: Monitored by USGS until December 2009, then by DNR to current year.



RICHLAND COUNTY

 WELL NUMBER: RIC-0543
 LATITUDE: 33° 52′ 30″

 GRID NUMBER: 27Q-m1
 LONGITUDE: 80° 42′ 09″

LOCATION: Eastover (Webber Elementary School).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 420 ft. Screened from 370 to 410 ft.

LAND SURFACE ELEVATION: 183.82 ft above National Geodetic Vertical Datum of 1929.

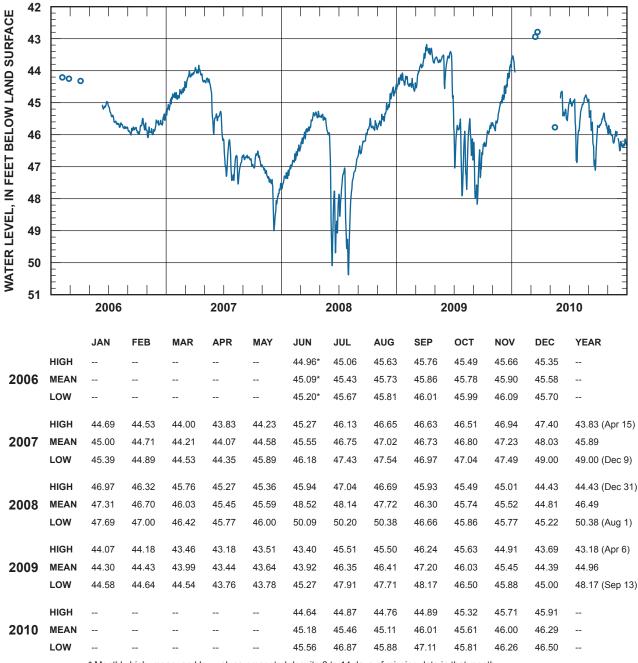
MEASURING POINT: Port in base of enclosure, 3.44 ft above land surface.

PERIOD OF RECORD: August 1999 to current year.

EXTREMES: Highest water level: 41.11 ft below land surface, March 28, 2000.

Lowest water level: 50.38 ft below land surface, August 1, 2008.

REMARKS: Drilled and cored for DNR/USGS aquifer delineation project.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

RICHLAND COUNTY

 WELL NUMBER: RIC-0585
 LATITUDE: 33° 56′ 56″

 GRID NUMBER: 29P-t4
 LONGITUDE: 80° 50′ 27″

LOCATION: Columbia, 6 miles east-southeast (Horrel Hill Elementary School).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 403 ft. Screened from 363 to 393 ft.

LAND SURFACE ELEVATION: 328.04 ft above National Geodetic Vertical Datum of 1929.

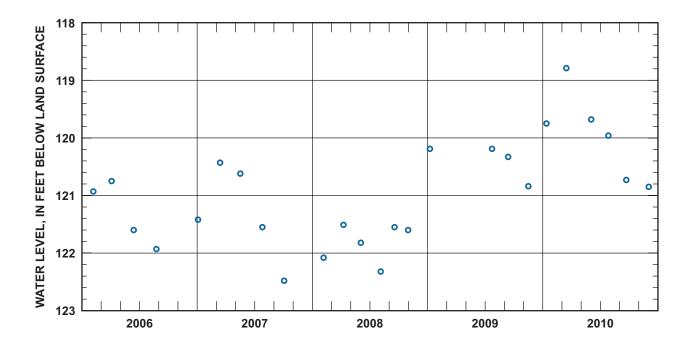
MEASURING POINT: Top of 2-inch casing, 4.50 ft above land surface.

PERIOD OF RECORD: September 1997 to current year.

EXTREMES: Highest water level: 115.45 ft below land surface, May 8, 1998.

Lowest water level: 124.95 ft below land surface, September 8, 2002.

REMARKS: Drilled and cored for DNR/USGS aguifer delineation project.



SUMTER COUNTY

 WELL NUMBER: SUM-0488
 LATITUDE: 33° 52′ 27″

 GRID NUMBER: 24Q-l1
 LONGITUDE: 80° 26′ 16″

LOCATION: Sumter, 3.5 miles southwest (Manchester State Forest).

AQUIFER: Middendorf (McQueen Branch).

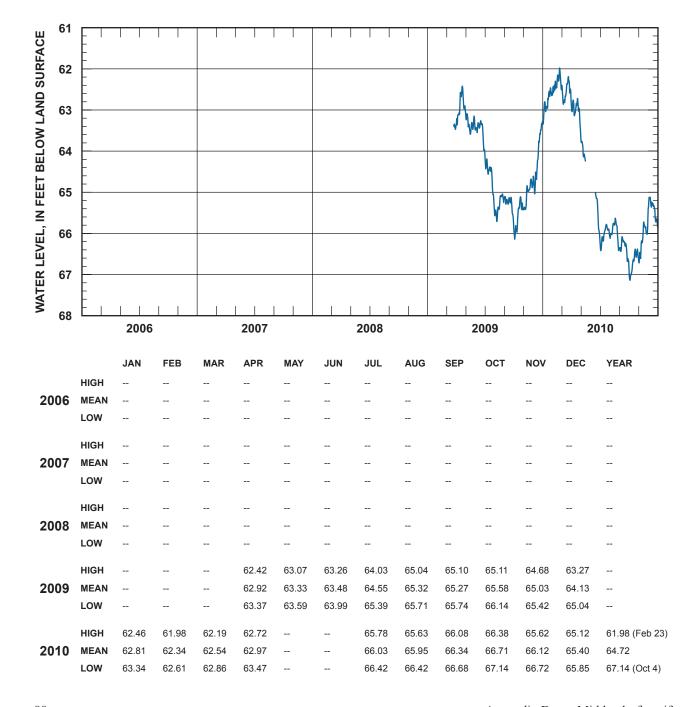
WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 546 ft. Screened from 511 to 541 ft. **LAND SURFACE ELEVATION:** 183 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of sanitary seal, 2.00 ft above land surface.

PERIOD OF RECORD: March 2009 to current year.

EXTREMES: Highest water level: 61.98 ft below land surface, February 23, 2010. Lowest water level: 67.14 ft below land surface, October 4, 2010.

REMARKS:



SUMTER COUNTY

WELL NUMBER: SUM-0492 **LATITUDE:** 33° 56′ 44″ **CRID NUMBER:** 19P-q3 **LONGITUDE:** 79° 58′ 47″

LOCATION: Olanta, 2.5 miles west-northwest (Woods Bay State Park).

AQUIFER: Middendorf (McQueen Branch).

WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 522 ft. Screened from 502 to 517 ft. **LAND SURFACE ELEVATION:** 125 ft (map estimate) above National Geodetic Vertical Datum of 1929.

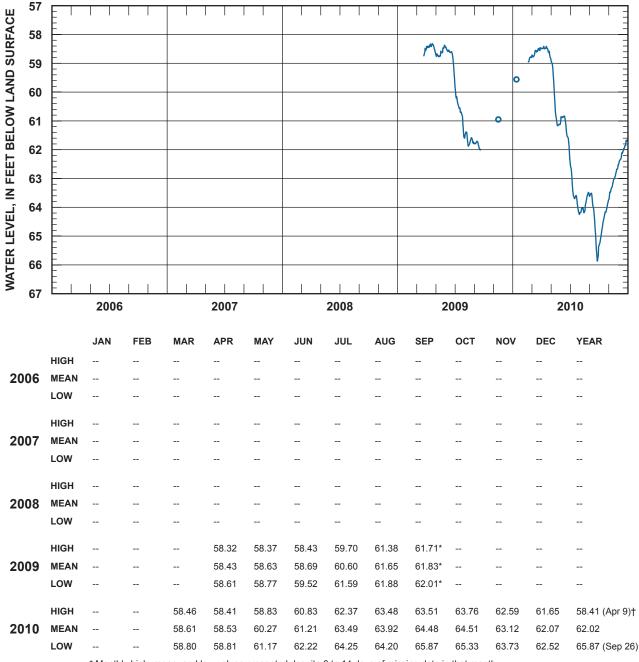
MEASURING POINT: Top of sanitary seal, 2.10 ft above land surface.

PERIOD OF RECORD: March 2009 to current year.

EXTREMES: Highest water level: 58.32 ft below land surface, April 21, 2009.

Lowest water level: 65.87 ft below land surface, September 26, 2010.

REMARKS:

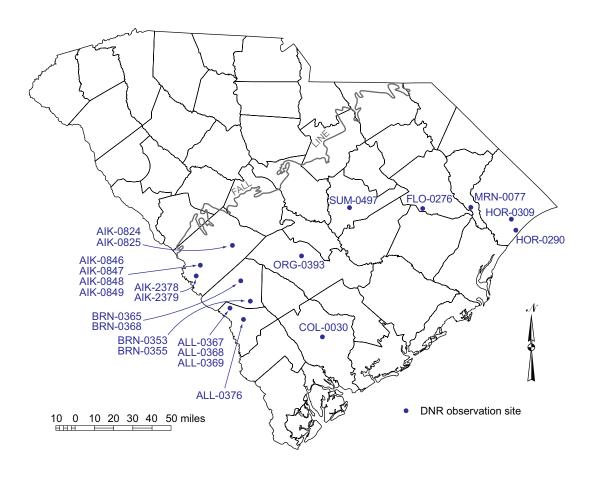


^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

APPENDIX E

Ground-water levels in the Black Creek aquifer, 2006–2010



 WELL NUMBER: AIK-0824
 LATITUDE: 33° 26′ 16″

 GRID NUMBER: 40V-s5
 LONGITUDE: 81° 46′ 13″

LOCATION: New Ellenton, 4 miles west-southwest (County Road 146).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 365 ft. Screened from 350 to 360 ft.

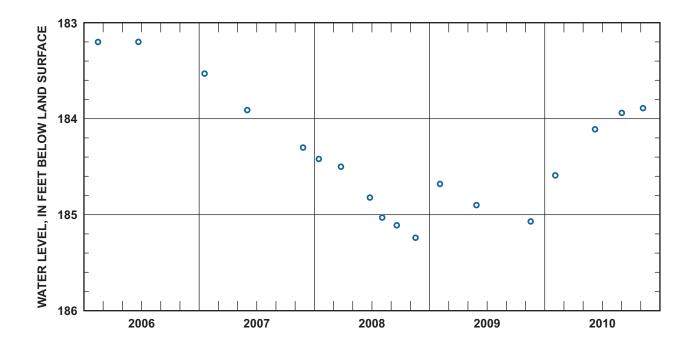
LAND SURFACE ELEVATION: 418.6 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.60 ft above land surface.

PERIOD OF RECORD: April 1993 to current year.

EXTREMES: Highest water level: 176.30 ft below land surface, July 20, 1996.

Lowest water level: 185.24 ft below land surface, November 17, 2008.



 WELL NUMBER: AIK-0825
 LATITUDE: 33° 26′ 16″

 GRID NUMBER: 40V-s6
 LONGITUDE: 81° 46′ 13″

LOCATION: New Ellenton, 4 miles west-southwest (County Road 146).

AQUIFER: Black Creek (Crouch Branch).

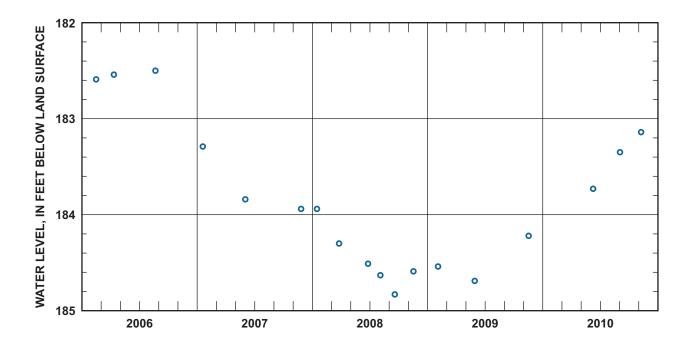
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 231 ft. Screened from 216 to 226 ft.

LAND SURFACE ELEVATION: 418.8 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 1.66 ft above land surface.

PERIOD OF RECORD: October 1989 to current year.

EXTREMES: Highest water level: 175.58 ft below land surface, February 2, 1999. Lowest water level: 184.83 ft below land surface, November 17, 2008.



 WELL NUMBER: AIK-0846
 LATITUDE: 33° 32′ 32″

 GRID NUMBER: 36U-03
 LONGITUDE: 81° 29′ 08″

LOCATION: Windsor, 4 miles north-northeast (Aiken State Park).

AQUIFER: Black Creek (Crouch Branch).

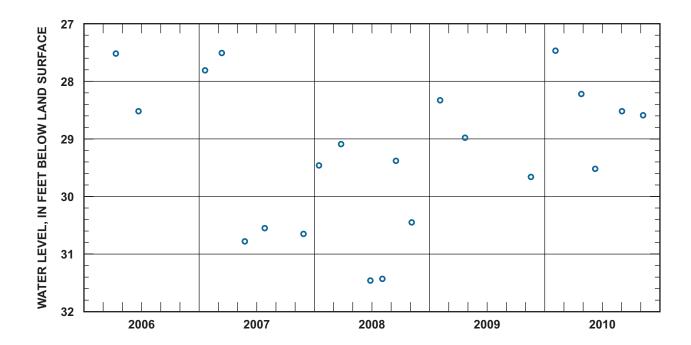
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 255 ft. Screened from 240 to 250 ft.

LAND SURFACE ELEVATION: 297.8 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 3.02 ft above land surface.

PERIOD OF RECORD: April 1993 to current year.

EXTREMES: Highest water level: 20.79 ft below land surface, March 19, 1996. Lowest water level: 31.46 ft below land surface, June 26, 2008.



 WELL NUMBER: AIK-0847
 LATITUDE: 33° 32′ 33″

 GRID NUMBER: 36U-04
 LONGITUDE: 81° 29′ 08″

LOCATION: Windsor, 4 miles north-northeast (Aiken State Park).

AQUIFER: Black Creek (Crouch Branch).

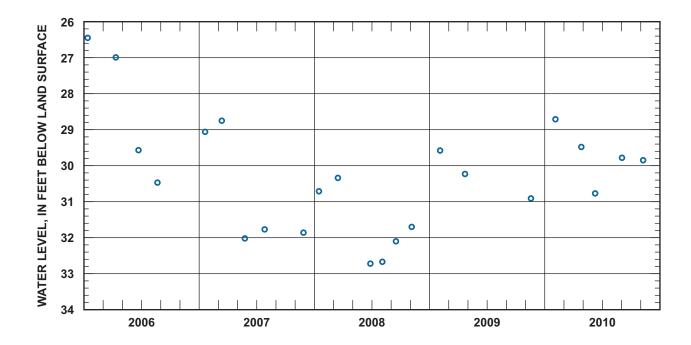
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 193 ft. Screened from 178 to 188 ft.

LAND SURFACE ELEVATION: 299.0 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.79 ft above land surface.

PERIOD OF RECORD: April 1993 to current year.

EXTREMES: Highest water level: 22.12 ft below land surface, March 19, 1996. Lowest water level: 32.72 ft below land surface, June 26, 2008.



 WELL NUMBER: AIK-0848
 LATITUDE: 33° 32′ 32″

 GRID NUMBER: 36U-05
 LONGITUDE: 81° 29′ 07″

LOCATION: Windsor, 4 miles north-northeast (Aiken State Park).

AQUIFER: Black Creek (Crouch Branch).

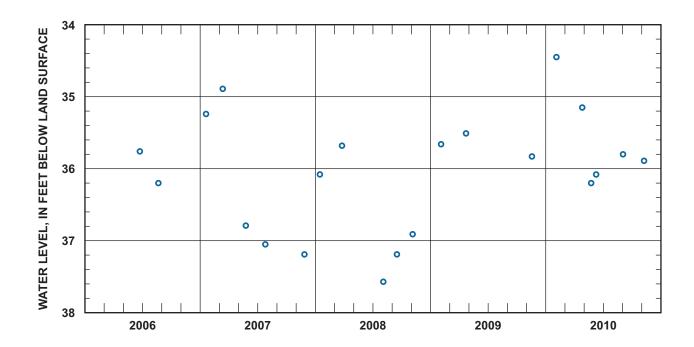
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 131 ft. Screened from 116 to 126 ft.

LAND SURFACE ELEVATION: 299.7 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 3.05 ft above land surface.

PERIOD OF RECORD: April 1993 to current year.

EXTREMES: Highest water level: 30.87 ft below land surface, March 2, 1994. Lowest water level: 37.57 ft below land surface, August 4, 2008.



WELL NUMBER: AIK-0849 **GRID NUMBER:** 36U-06 **LATITUDE:** 33° 32′ 33″ **LONGITUDE:** 81° 29′ 07″

LOCATION: Windsor, 4 miles north-northeast (Aiken State Park).

AQUIFER: Black Creek (Crouch Branch).

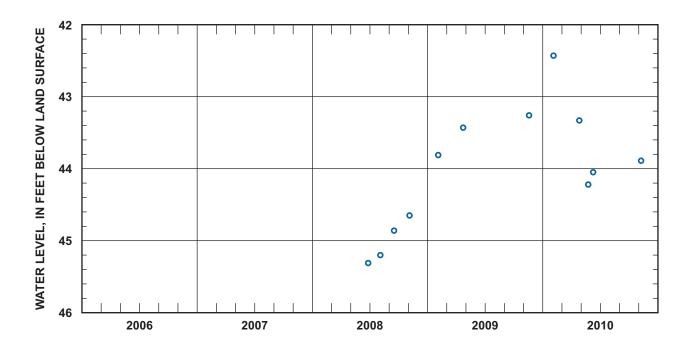
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 97 ft. Screened from 82 to 92 ft.

LAND SURFACE ELEVATION: 301.6 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 3.05 ft above land surface.

PERIOD OF RECORD: April 1993 to current year.

EXTREMES: Highest water level: 39.59 ft below land surface, March 12, 1998. Lowest water level: 45.31 ft below land surface, June 26, 2008.



WELL NUMBER: AIK-2378 **GRID NUMBER:** 40W-q2 **LATITUDE:** 33° 21′ 12″ **LONGITUDE:** 81° 48′ 32″

LOCATION: Jackson, 1 mile northwest (S.C. Highway 125).

AQUIFER: Black Creek (Crouch Branch).

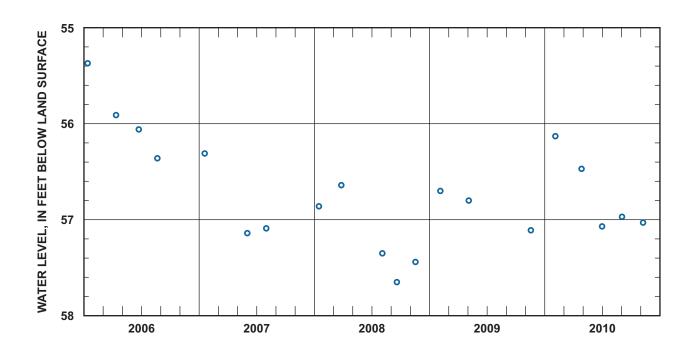
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 185 ft. Screened from 170 to 180 ft.

LAND SURFACE ELEVATION: 220.25 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 1.54 ft above land surface.

PERIOD OF RECORD: February 1996 to current year.

EXTREMES: Highest water level: 52.24 ft below land surface, March 19, 1996. Lowest water level: 57.65 ft below land surface, September 19, 2008.



AIKEN COUNTY

WELL NUMBER: AIK-2379 **GRID NUMBER:** 40W-q3 **LATITUDE:** 33° 21′ 12″ **LONGITUDE:** 81° 48′ 32″

LOCATION: Jackson, 1 mile northwest (S.C. Highway 125).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 266 ft. Screened from 251 to 261 ft.

LAND SURFACE ELEVATION: 223.68 ft above National Geodetic Vertical Datum of 1929.

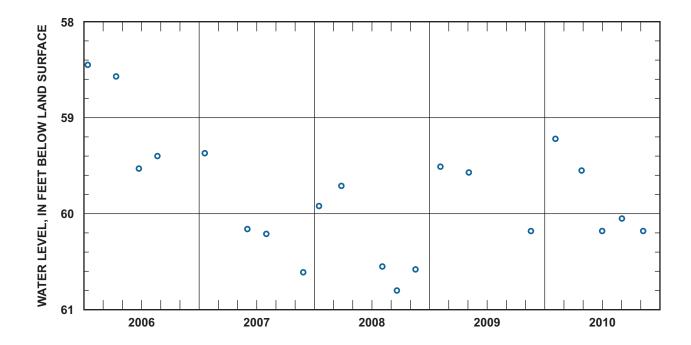
MEASURING POINT: Port in sanitary seal, 2.43 ft above land surface.

PERIOD OF RECORD: April 1996 to current year.

EXTREMES: Highest water level: 55.07 ft below land surface, April 2, 1996.

Lowest water level: 60.80 ft below land surface, September 19, 2008.

REMARKS: Well-cluster site C-1. One of four wells drilled on site for Department of Energy and DNR project.



WELL NUMBER: ALL-0367 **LATITUDE**: 33° 06′ 48″ **GRID NUMBER: 37Z-t8 LONGITUDE**: 81° 30′ 21″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 566 ft. Screened from 551 to 561 ft.

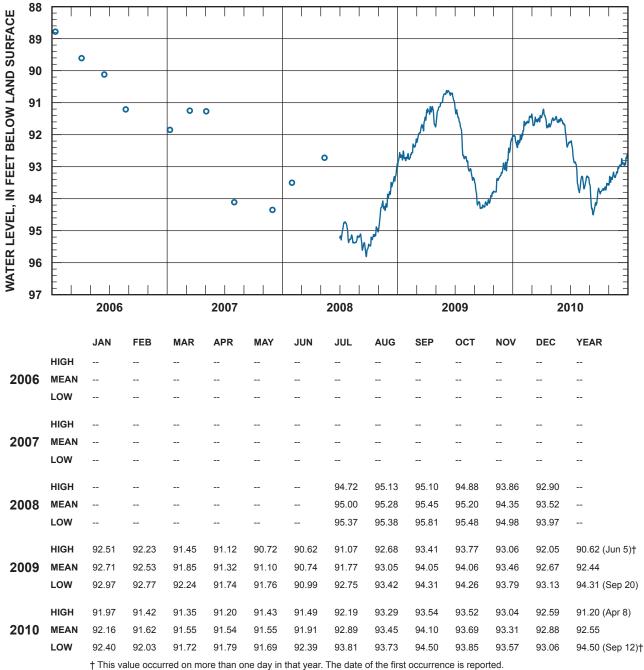
LAND SURFACE ELEVATION: 245.74 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Top of gray PVC instrument support, 2.59 ft above land surface.

PERIOD OF RECORD: November 1995 to current year.

EXTREMES: Highest water level: 81.75 ft below land surface, May 8, 1998.

Lowest water level: 95.81 ft below land surface, September 23, 2008.

REMARKS: Well-cluster site C-7. One of nine wells drilled on site for Department of Energy and DNR project.



 WELL NUMBER: ALL-0368
 LATITUDE: 33° 06′ 49″

 GRID NUMBER: 37Z-t9
 LONGITUDE: 81° 30′ 22″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 691 ft. Screened from 676 to 686 ft.

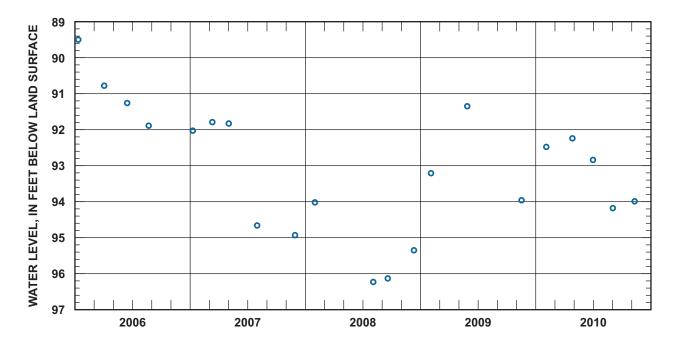
LAND SURFACE ELEVATION: 246.59 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.46 ft above land surface.

PERIOD OF RECORD: January 2006 to current year.

EXTREMES: Highest water level: 89.50 ft below land surface datum, January 12, 2006. Lowest water level: 96.23 ft below land surface datum, August 4, 2008.

REMARKS: Well-cluster site C-7. One of nine wells drilled on site for Department of Energy and



 WELL NUMBER: ALL-0369
 LATITUDE: 33° 06′ 47″

 GRID NUMBER: 37Z-t10
 LONGITUDE: 81° 30′ 22″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 800 ft. Screened from 785 to 795 ft.

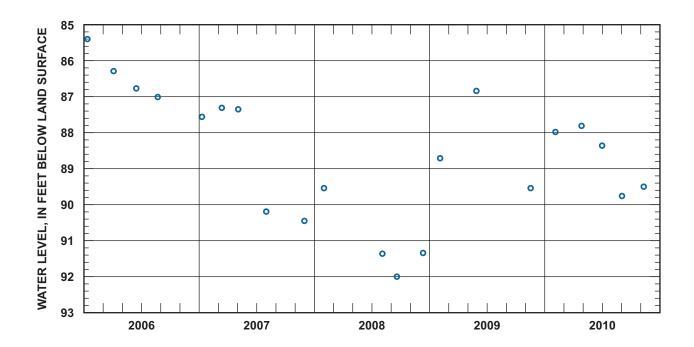
LAND SURFACE ELEVATION: 242.12 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.42 ft above land surface.

PERIOD OF RECORD: January 2006 to current year.

EXTREMES: Highest water level: 85.40 ft below land surface, January 12, 2006. Lowest water level: 92.00 ft below land surface, September 19, 2008.

REMARKS: Well-cluster site C-7. One of nine wells drilled on site for Department of Energy and DNR project.



 WELL NUMBER: ALL-0376
 LATITUDE: 33° 01′ 30″

 GRID NUMBER: 35AA-q9
 LONGITUDE: 81° 23′ 05″

LOCATION: Allendale, 3.5 miles west (County Road 52).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 994 ft. Screened from 784 to 989 ft.

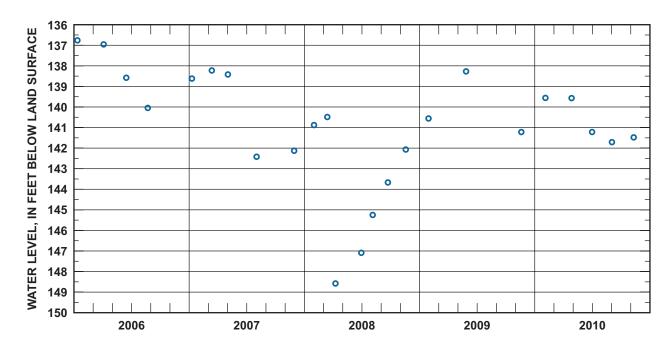
LAND SURFACE ELEVATION: 282.23 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 3.33 ft above land surface.

PERIOD OF RECORD: August 1996 to current year.

EXTREMES: Highest water level: 129.61 ft below land surface, May 8, 1998. Lowest water level: 148.58 ft below land surface, April 8, 2008.

REMARKS: Well-cluster site C-10. One of nine wells drilled on site for Department of Energy and



WELL NUMBER: BRN-0353 **LATITUDE:** 33° 10′ 44″ **GRID NUMBER:** 34Y-x5 **LONGITUDE:** 81° 18′ 51″

LOCATION: Barnwell, 4 miles southeast (S.C. Highway 300).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 588 ft. Screened from 573 to 583 ft.

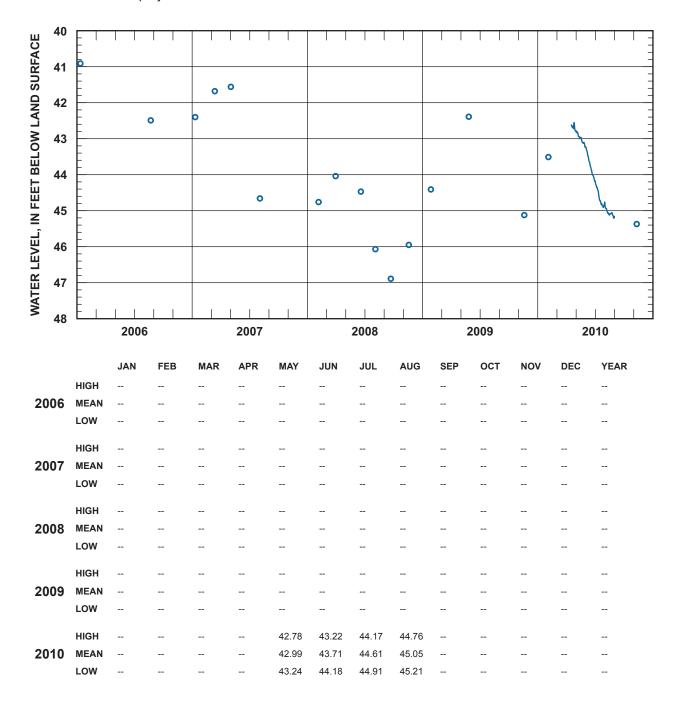
LAND SURFACE ELEVATION: 207.7 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.61 ft above land surface.

PERIOD OF RECORD: October 1989 to current year.

EXTREMES: Highest water level: 31.48 ft below land surface, March 26, 1994. Lowest water level: 46.89 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-6. One of eight wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0355
 LATITUDE: 33° 10′ 44″

 GRID NUMBER: 34Y-x7
 LONGITUDE: 81° 18′ 52″

LOCATION: Barnwell, 4 miles southeast (off S.C. Highway 300).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 701 ft. Screened from 686 to 696 ft.

LAND SURFACE ELEVATION: 208.0 ft above National Geodetic Vertical Datum of 1929.

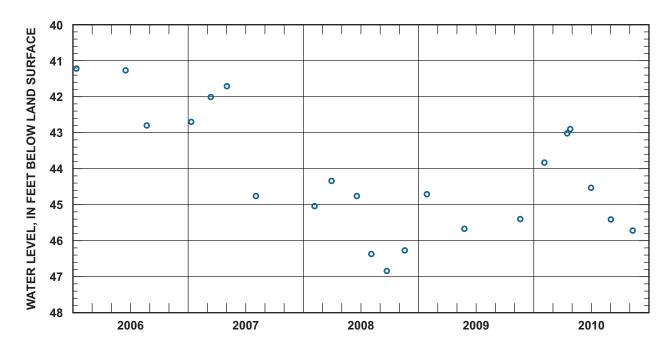
MEASURING POINT: Port in sanitary seal, 2.59 ft above land surface.

PERIOD OF RECORD: October 1989 to current year.

EXTREMES: Highest water level: 32.54 ft below land surface, April 21, 1993.

Lowest water level: 46.84 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-6. One of eight wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0365
 LATITUDE: 33° 19′ 18″

 GRID NUMBER: 35X-e5
 LONGITUDE: 81° 24′ 24″

LOCATION: Williston, 3.5 miles south. **AQUIFER:** Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 539 ft. Screened from 524 to 534 ft.

LAND SURFACE ELEVATION: 263.5 ft above National Geodetic Vertical Datum of 1929.

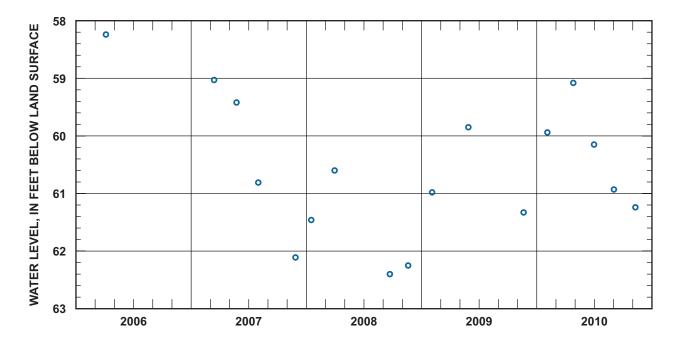
MEASURING POINT: Port in sanitary seal, 3.00 ft above land surface.

PERIOD OF RECORD: May 1993 to current year.

EXTREMES: Highest water level: 51.57 ft below land surface, May 23, 1993.

Lowest water level: 62.40 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-5. One of seven wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0368
 LATITUDE: 33° 19′ 17″

 GRID NUMBER: 35X-e8
 LONGITUDE: 81° 24′ 24″

LOCATION: Williston, 3.5 miles south. **AQUIFER:** Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 443 ft. Screened from 428 to 438 ft.

LAND SURFACE ELEVATION: 265.1 ft above National Geodetic Vertical Datum of 1929.

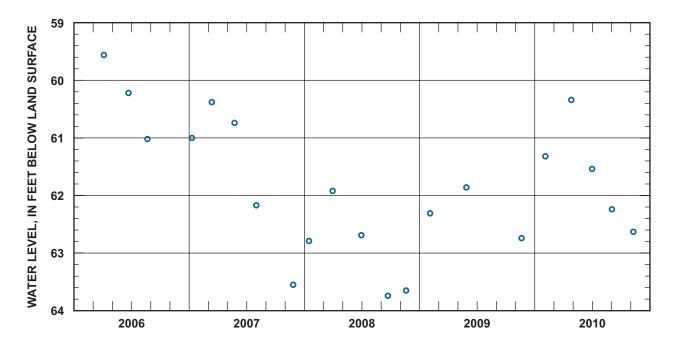
MEASURING POINT: Port in sanitary seal, 3.05 ft above land surface.

PERIOD OF RECORD: May 1993 to current year.

EXTREMES: Highest water level: 53.13 ft below land surface, May 21, 1993.

Lowest water level: 63.74 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-5. One of seven wells drilled on site for Department of Energy and



COLLETON COUNTY

 WELL NUMBER: COL-0030
 LATITUDE: 32° 53′ 45″

 GRID NUMBER: 27CC-j1
 LONGITUDE: 80° 40′ 40″

LOCATION: Walterboro (Kline Street). **AQUIFER:** Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter unused public-supply well. Depth: 1,340 ft. Open interval

unknown.

LAND SURFACE ELEVATION: 61.30 ft above National Geodetic Vertical Datum of 1929.

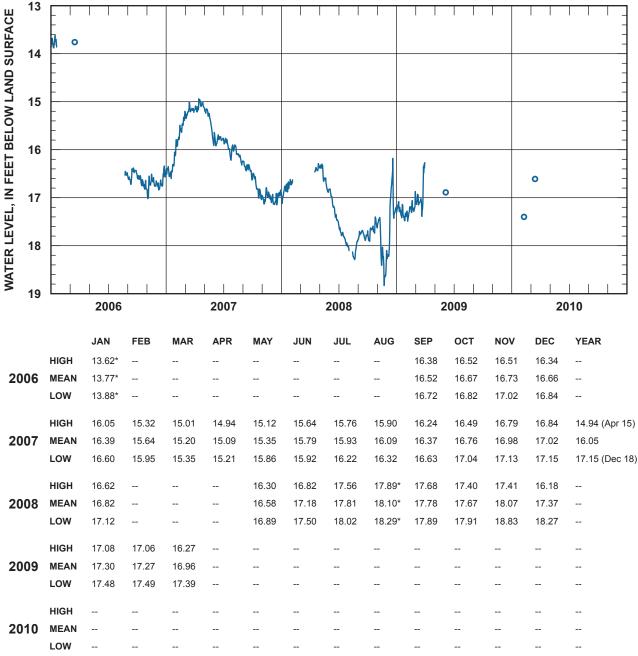
MEASURING POINT: Port in sanitary seal, 0.30 ft above land surface.

PERIOD OF RECORD: January 1996 to current year.

EXTREMES: Highest water level: 8.52 below land surface, May 8, 1998.

Lowest water level: 18.83 ft below land surface, November 11, 2008.

REMARKS:



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

FLORENCE COUNTY

 WELL NUMBER: FLO-0276
 LATITUDE: 33° 51′ 21″

 GRID NUMBER: 16Q-s2
 LONGITUDE: 79° 46′ 00″

LOCATION: Lake City (Lake City Airport). **AQUIFER:** Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 250 ft. Screened from 230 to 250 ft.

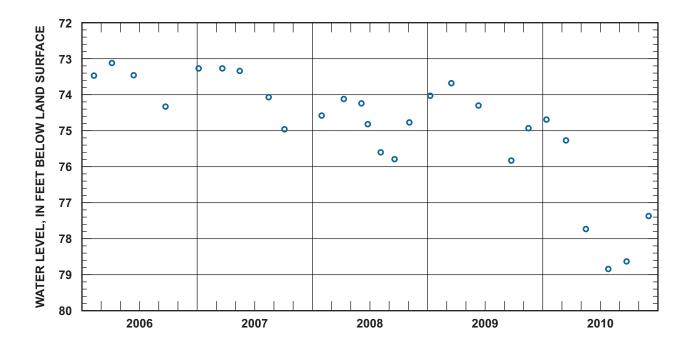
LAND SURFACE ELEVATION: 79.00 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 1.31 ft above land surface.

PERIOD OF RECORD: September 2000 to current year.

EXTREMES: Highest water level: 62.81 ft below land surface, March 13, 2001. Lowest water level: 78.84 ft below land surface, July 27, 2010.

REMARKS: Drilled and cored for DNR/USGS Pee Dee region ground-water study.



HORRY COUNTY

WELL NUMBER: HOR-0290 **LATITUDE**: 33° 40′ 15″ **GRID NUMBER:** 6S-v2 **LONGITUDE**: 78° 56′ 21″

LOCATION: Myrtle Beach (southeast corner of Blizzard Street and Deville Street).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 8-inch diameter observation well. Depth: 459 ft. Screened interval unknown. LAND SURFACE ELEVATION: 20 ft (map estimate) above National Geodetic Vertical Datum of 1929.

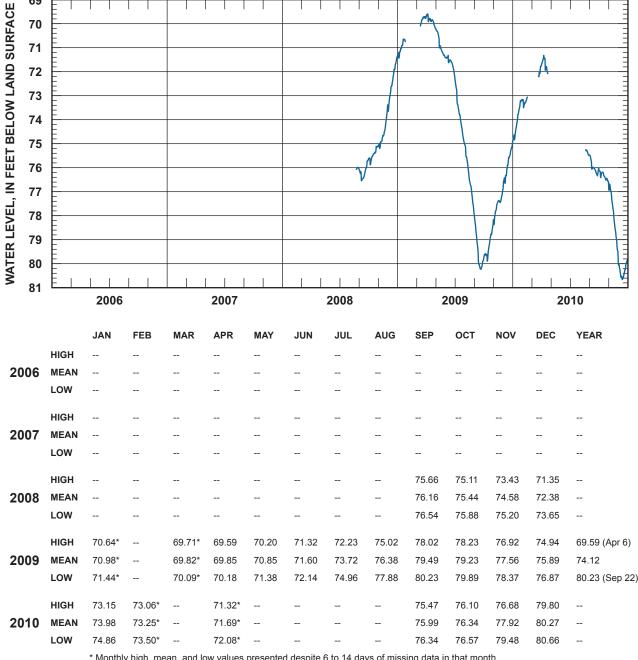
MEASURING POINT: Port in PVC instrument support, 0.00 ft above land surface.

PERIOD OF RECORD: 1975 to current year.

69

EXTREMES: Highest water level: 60.60 ft below land surface, June 19, 1975. Lowest water level: 174.65 ft below land surface, July 12, 1988.

REMARKS: Intermittent measurements from 1975 to 2008.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

HORRY COUNTY

WELL NUMBER: HOR-0309 LATITUDE: 33° 46′ 04″ **LONGITUDE**: 78° 57′ 59″ **GRID NUMBER:** 6R-r1

LOCATION: Conway, 2 miles southeast (U.S. Highway 501).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 375 ft. Screened from 360 to 375 ft.

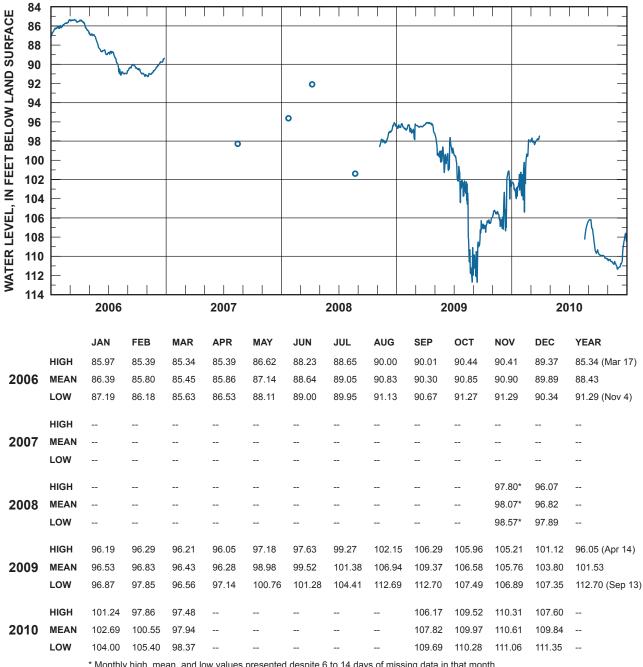
LAND SURFACE ELEVATION: 42.84 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Opening in white PVC instrument support, 3.74 ft above land surface.

PERIOD OF RECORD: April 2001 to current year.

EXTREMES: Highest water level: 83.53 ft below land surface, April 10, 2001.

Lowest water level: 112.70 ft below land surface, September 13, 2009.

REMARKS: Water levels may be affected by pumping and Aquifer Storage and Recovery projects.



MARION COUNTY

WELL NUMBER: MRN-0077 LATITUDE: 33° 51′ 42″ **GRID NUMBER:** 10Q-p1 **LONGITUDE**: 79° 19′ 50″

LOCATION: Brittons Neck, 3 miles south (former Brittons Neck Fire Tower).

AQUIFER: Black Creek (Crouch Branch).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 356 ft. Screened from 325 to 355 ft.

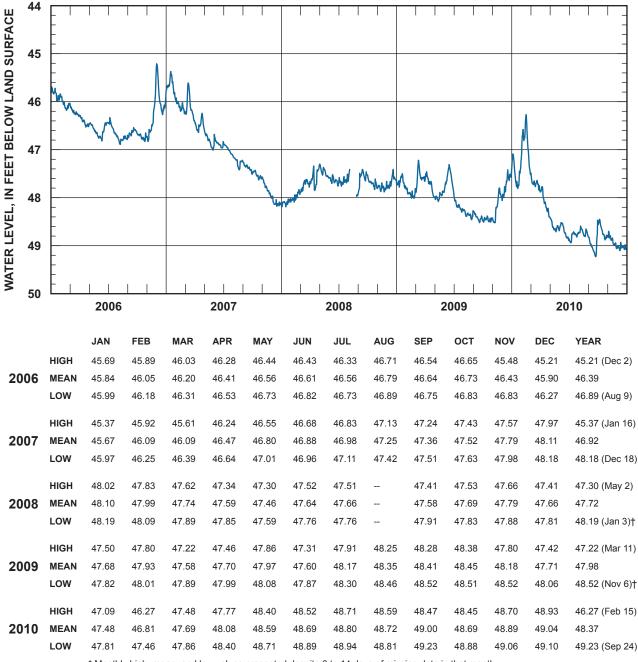
LAND SURFACE ELEVATION: 31.66 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Opening in PVC instrument support, 1.70 ft above land surface.

PERIOD OF RECORD: August 1982 to current year.

EXTREMES: Highest water level: 10.88 ft below land surface, March 28, 1983.

Lowest water level: 49.23 ft below land surface, September 24, 2010.

REMARKS: Monitored by USGS until December 2001, then by DNR to current year.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

ORANGEBURG COUNTY

 WELL NUMBER: ORG-0393
 LATITUDE: 33° 30′ 30″

 GRID NUMBER: 29U-v1
 LONGITUDE: 80° 51′ 54″

LOCATION: Orangeburg (Clark Middle School). **AQUIFER:** Black Creek (Crouch Branch).

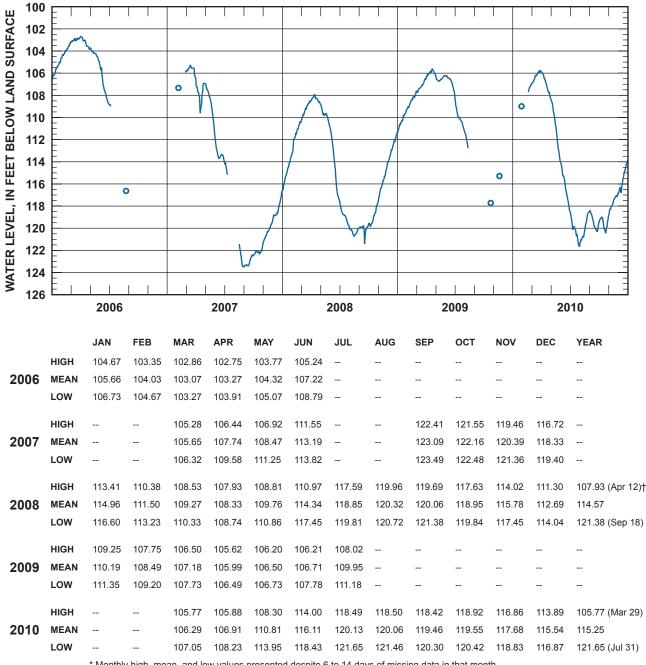
WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 463 ft. Screened from 423 to 463 ft. **LAND SURFACE ELEVATION:** 256 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 3.51 ft above land surface.

PERIOD OF RECORD: March 2001 to current year.

EXTREMES: Highest water level: 100.73 ft below land surface, March 6, 2004. Lowest water level: 123.49 ft below land surface, September 2, 2007.

REMARKS: Drilled and cored for DNR/USGS aguifer delineation project.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

SUMTER COUNTY

 WELL NUMBER: SUM-0497
 LATITUDE: 33° 52′ 27″

 GRID NUMBER: 24Q-l2
 LONGITUDE: 80° 26′ 16″

LOCATION: Sumter, 3.5 miles southwest (Manchester State Forest).

AQUIFER: Black Creek (Crouch Branch).

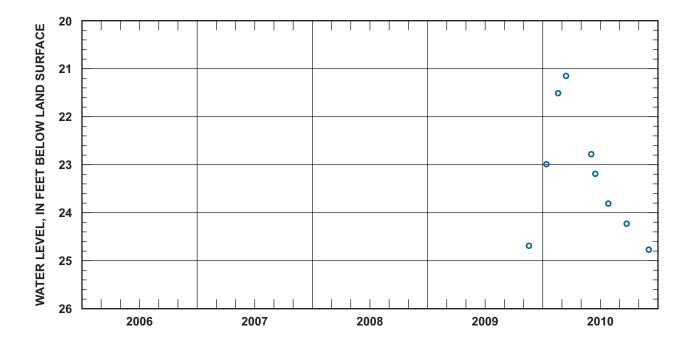
WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 100 ft. Screened from 70 to 100 ft. **LAND SURFACE ELEVATION:** 183 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of casing, 0.65 ft above land surface.

PERIOD OF RECORD: November 2009 to current year.

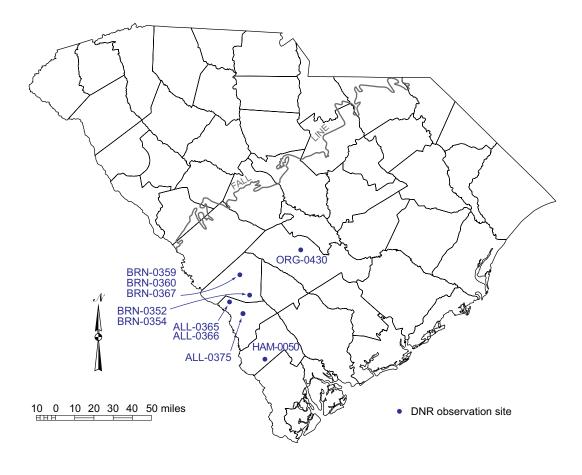
EXTREMES: Highest water level: 21.15 ft below land surface, March 15, 2010. Lowest water level: 24.77 ft below land surface, December 2, 2010.

REMARKS:



APPENDIX F

Ground-water levels in the Tertairy sand aquifer, 2006–2010



 WELL NUMBER: ALL-0365
 LATITUDE: 33° 06′ 49″

 GRID NUMBER: 37Z-t6
 LONGITUDE: 81° 30′ 22″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Tertiary sand (Gordon).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 333 ft. Screened from 318 to 328 ft.

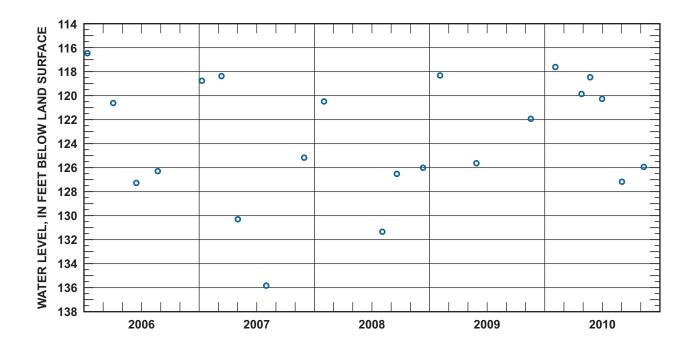
LAND SURFACE ELEVATION: 244.29 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.87 ft above land surface.

PERIOD OF RECORD: January 2004 to current year.

EXTREMES: Highest water level: 116.28 ft below land surface, January 27, 2005. Lowest water level: 135.83 ft below land surface, August 2, 2007.

REMARKS: Well-cluster site C-7. One of nine wells drilled on site for Department of Energy and DNR project.



 WELL NUMBER: ALL-0366
 LATITUDE: 33° 06′ 48″

 GRID NUMBER: 37Z-t7
 LONGITUDE: 81° 30′ 22″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Tertiary sand (Gordon).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 400 ft. Screened from 385 to 395 ft.

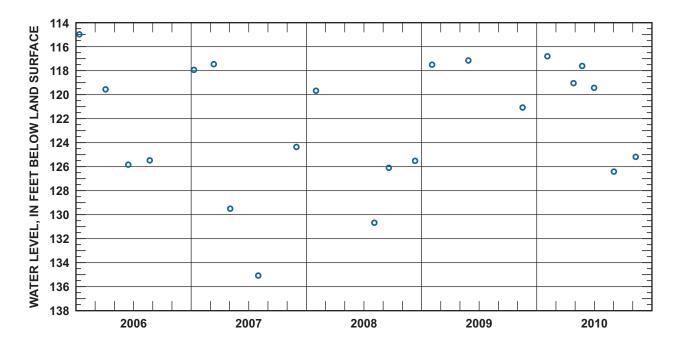
LAND SURFACE ELEVATION: 243.50 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.50 ft above land surface.

PERIOD OF RECORD: November 1995 to current year.

EXTREMES: Highest water level: 108.34 ft below land surface, May 8, 1998. Lowest water level: 135.07 ft below land surface, August 2, 2007.

REMARKS: Well-cluster site C-7. One of nine wells drilled on site for Department of Energy and



 WELL NUMBER: ALL-0375
 LATITUDE: 33° 01′ 30″

 GRID NUMBER: 35AA-q8
 LONGITUDE: 81° 23′ 06″

LOCATION: Allendale, 3.5 miles west (County Road 52).

AQUIFER: Tertiary sand (Gordon).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 583 ft. Screened from 453 to 578 ft.

LAND SURFACE ELEVATION: 282.89 ft above National Geodetic Vertical Datum of 1929.

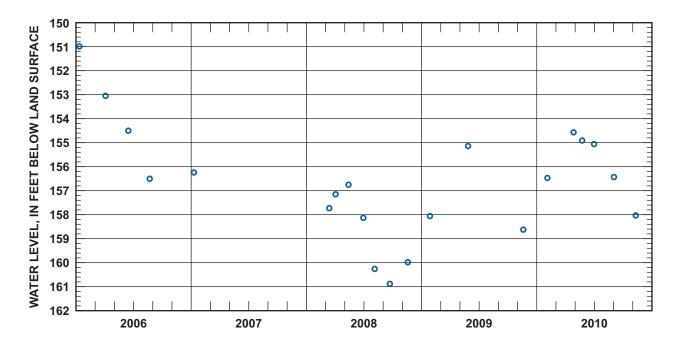
MEASURING POINT: Port in sanitary seal, 3.46 ft above land surface.

PERIOD OF RECORD: October 1996 to current year.

EXTREMES: Highest water level: 145.98 ft below land surface, May 8, 1998.

Lowest water level: 160.88 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-10. One of nine wells drilled on site for Department of Energy and



WELL NUMBER: BRN-0352 **LATITUDE:** 33° 10′ 44″ **GRID NUMBER:** 34Y-x4 **LONGITUDE:** 81° 18′ 51″

LOCATION: Barnwell, 4 miles southeast (S.C. Highway 300).

AQUIFER: Tertiary sand (Gordon).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 293 ft. Screened from 278 to 288 ft.

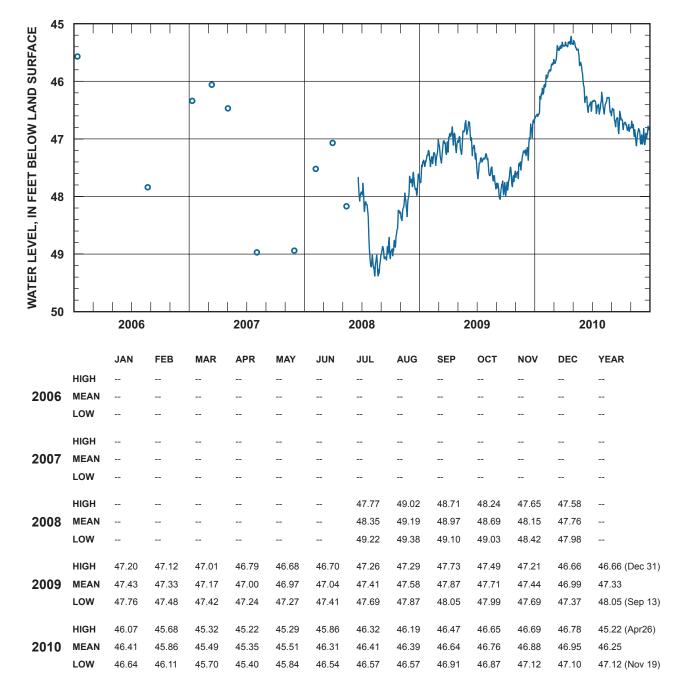
LAND SURFACE ELEVATION: 207.2 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Top of white PVC instrument suppport, 2.49 ft above land surface.

PERIOD OF RECORD: February 1989 to current year.

EXTREMES: Highest water level: 38.63 ft below land surface, April 21, 1993.

Lowest water level: 49.38 ft below land surface, August 12, 2008 and August 22, 2008.

REMARKS: Well-cluster site C-6. One of eight wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0354
 LATITUDE: 33° 10′ 45″

 GRID NUMBER: 34Y-x6
 LONGITUDE: 81° 18′ 51″

LOCATION: Barnwell, 4 miles southeast (S.C. Highway 300).

AQUIFER: Tertiary sand (Gordon).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 411 ft. Screened from 396 to 406 ft.

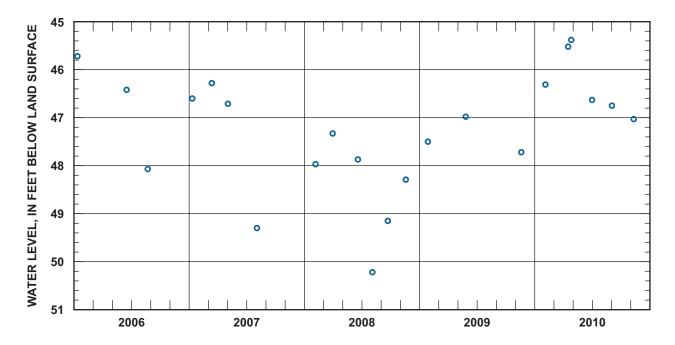
LAND SURFACE ELEVATION: 207.6 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.85 ft above land surface.

PERIOD OF RECORD: February 1989 to current year.

EXTREMES: Highest water level: 38.95 ft below land surface, April 21, 1993. Lowest water level: 50.22 ft below land surface, August 4, 2008.

REMARKS: Well-cluster site C-6. One of eight wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0359
 LATITUDE: 33° 19′ 19″

 GRID NUMBER: 35X-e3
 LONGITUDE: 81° 24′ 24″

LOCATION: Williston, 3.5 miles south. **AQUIFER:** Tertiary sand (Gordon).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 214 ft. Screened from 199 to 209 ft.

LAND SURFACE ELEVATION: 265.5 ft above National Geodetic Vertical Datum of 1929.

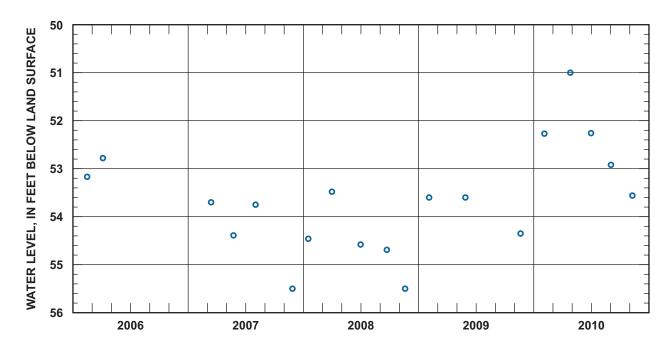
MEASURING POINT: Port in sanitary seal, 3.00 ft above land surface.

PERIOD OF RECORD: February 1989 to current year.

EXTREMES: Highest water level: 44.39 ft below land surface, April 15, 1996.

Lowest water level: 55.50 ft below land surface, November 27, 2007 and November 18, 2008.

REMARKS: Well-cluster site C-5. One of seven wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0360
 LATITUDE: 33° 19′ 18″

 GRID NUMBER: 35X-e4
 LONGITUDE: 81° 24′ 24″

LOCATION: Williston, 3.5 miles south.

AQUIFER: Tertiary sand (Upper Three Runs).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 140 ft. Screened from 125 to 134 ft.

LAND SURFACE ELEVATION: 264.3 ft above National Geodetic Vertical Datum of 1929.

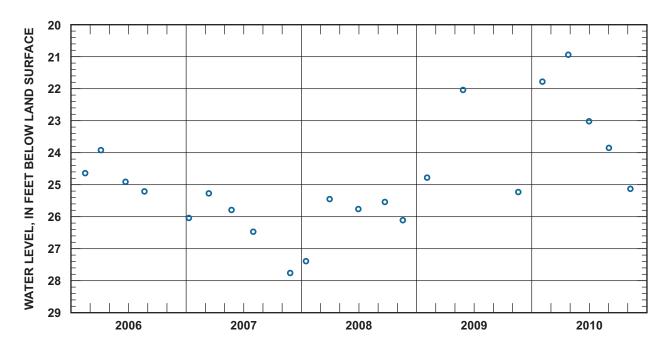
MEASURING POINT: Port in sanitary seal, 2.06 ft above land surface.

PERIOD OF RECORD: February 1989 to current year.

EXTREMES: Highest water level: 14.15 ft below land surface, May 23, 1993.

Lowest water level: 27.76 ft below land surface, November 27, 2007.

REMARKS: Well-cluster site C-5. One of seven wells drilled on site for Department of Energy and



 WELL NUMBER: BRN-0367
 LATITUDE: 33° 19′ 17″

 GRID NUMBER: 35X-e7
 LONGITUDE: 81° 24′ 25″

LOCATION: Williston, 3.5 miles south. **AQUIFER:** Tertiary sand (Gordon).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 285 ft. Screened from 270 to 280 ft.

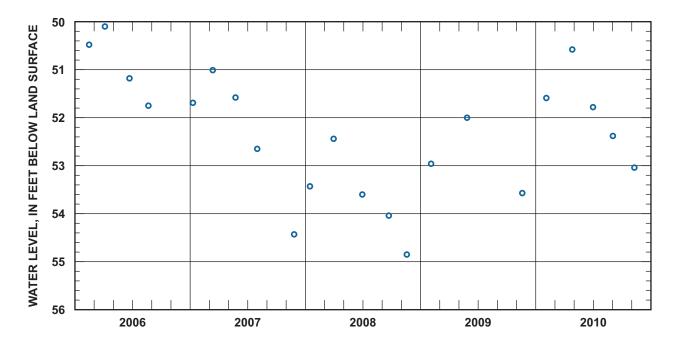
LAND SURFACE ELEVATION: 263.8 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 3.00 ft above land surface.

PERIOD OF RECORD: May 1993 to current year.

EXTREMES: Highest water level: 43.64 ft below land surface, May 21, 1993. Lowest water level: 54.85 ft below land surface, November 18, 2008.

REMARKS: Well-cluster site C-5. One of seven wells drilled on site for Department of Energy and



HAMPTON COUNTY

 WELL NUMBER: HAM-0050
 LATITUDE: 32° 40′ 48″

 GRID NUMBER: 33EE-v1
 LONGITUDE: 81° 11′ 20″

LOCATION: Furman (U.S. Highway 601). **AQUIFER:** Tertiary sand (Gordon).

WELL CHARACTERISTICS: 8-inch diameter unused public supply well. Depth: 968 ft. Open interval

unknown.

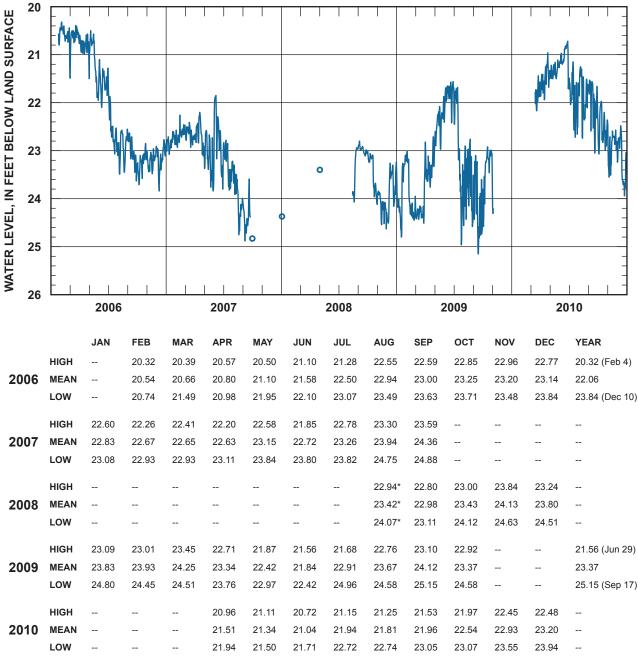
LAND SURFACE ELEVATION: 115 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of PVC instrument support, 2.25 ft above land surface.

PERIOD OF RECORD: February 2001 to current year.

EXTREMES: Highest water level: 19.52 ft below land surface, June 25, 2004. Lowest water level: 26.73 ft below land surface, June 1, 2002.

REMARKS:



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

ORANGEBURG COUNTY

WELL NUMBER: ORG-0430 **LATITUDE:** 33° 30′ 30″ **GRID NUMBER:** 29U-v2 **LONGITUDE:** 80° 51′ 54″

LOCATION: Orangeburg (Clark Middle School).

AQUIFER: Tertiary sand (Gordon).

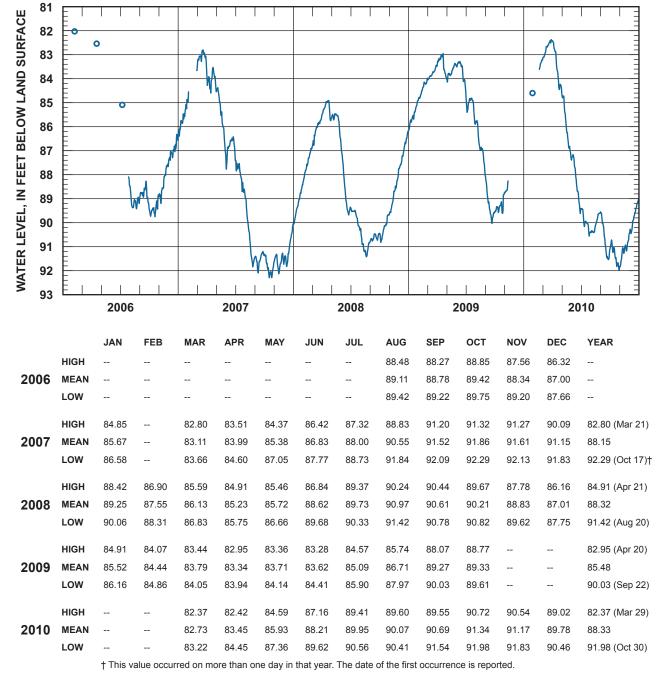
WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 275 ft. Screened from 205 to 265 ft. **LAND SURFACE ELEVATION:** 256 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 3.25 ft above land surface.

PERIOD OF RECORD: March 2001 to current year.

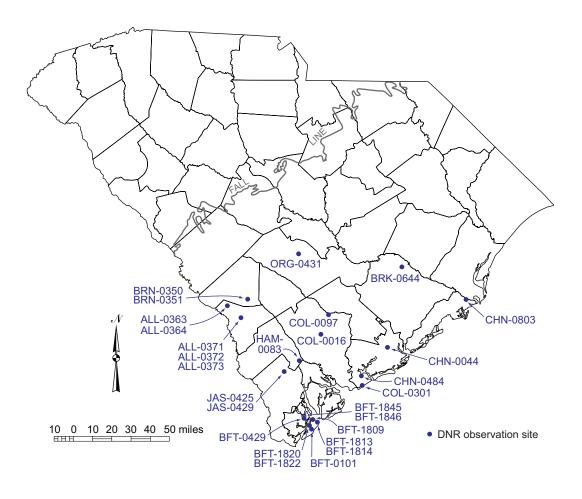
EXTREMES: Highest water level: 80.25 ft below land surface, March 26, 2004. Lowest water level: 92.70 ft below land surface, September 25, 2002.

REMARKS: Drilled and cored for DNR/USGS aguifer delineation project.



APPENDIX G

Ground-water levels in the Floridan aquifer, 2006–2010



WELL NUMBER: ALL-0363 **LATITUDE:** 33° 06′ 50″ **GRID NUMBER:** 37Z-t4 **LONGITUDE:** 81° 30′ 22″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Floridan (Upper Three Runs).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 105 ft. Screened from 90 to 100 ft.

LAND SURFACE ELEVATION: 246.13 ft above National Geodetic Vertical Datum of 1929.

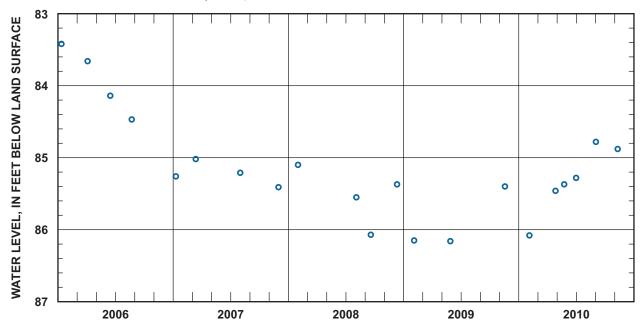
MEASURING POINT: Port in sanitary seal, 2.53 ft above land surface.

PERIOD OF RECORD: November 1995 to current year.

EXTREMES: Highest water level: 68.34 ft below land surface, June 14, 1998. Lowest water level: 86.16 ft below land surface, May 29, 2009.

REMARKS: Well-cluster site C-7. One of nine wells drilled on site for Department of Energy and

DNR project. Site is located near updip limit of Floridan aquifer (transition zone between



 WELL NUMBER: ALL-0364
 LATITUDE: 33° 06′ 49″

 GRID NUMBER: 37Z-t5
 LONGITUDE: 81° 30′ 22″

LOCATION: Millet, 3 miles northeast (County Road 24).

AQUIFER: Floridan (Upper Three Runs).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 225 ft. Screened from 210 to 220 ft.

LAND SURFACE ELEVATION: 245.17 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.53 ft above land surface.

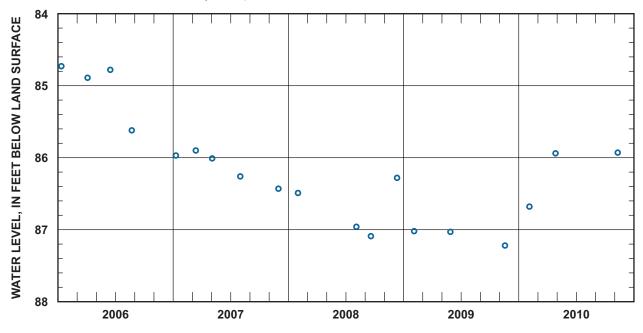
PERIOD OF RECORD: November 1995 to current year.

EXTREMES: Highest water level: 71.90 ft below land surface, May 8, 1998.

Lowest water level: 87.22 ft below land surface, November 17, 2009.

REMARKS: Well-cluster site C-7. One of nine wells drilled on site for Department of Energy and

DNR project. Site is located near updip limit of Floridan aquifer (transition zone between



 WELL NUMBER: ALL-0371
 LATITUDE: 33° 01′ 29″

 GRID NUMBER: 35AA-q4
 LONGITUDE: 81° 23′ 05″

LOCATION: Allendale, 3.5 miles west (County Road 52).

AQUIFER: Floridan (Upper Floridan).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 217 ft. Screened from 192 to 212 ft.

LAND SURFACE ELEVATION: 282.23 ft above National Geodetic Vertical Datum of 1929.

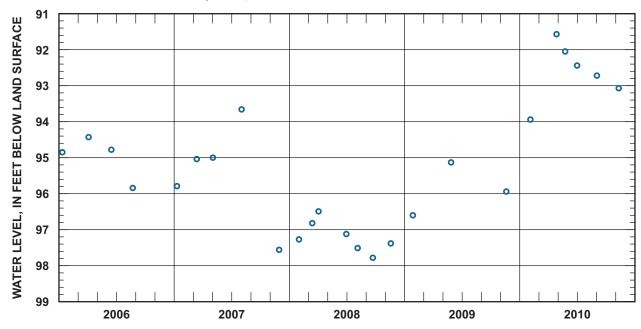
MEASURING POINT: Port in sanitary seal, 3.00 ft above land surface.

PERIOD OF RECORD: August 1996 to current year.

EXTREMES: Highest water level: 85.46 ft below land surface, May 10, 1998. Lowest water level: 100.11 ft below land surface, November 8, 2002.

REMARKS: Well-cluster site C-10. One of nine wells drilled on site for Department of Energy and

DNR project. Site is located near updip limit of Floridan aquifer (transition zone between



 WELL NUMBER: ALL-0372
 LATITUDE: 33° 01′ 29″

 GRID NUMBER: 35AA-q5
 LONGITUDE: 81° 23′ 04″

LOCATION: Allendale, 3.5 miles west (County Road 52).

AQUIFER: Floridan (Upper Floridan).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 155 ft. Screened from 140 to 150 ft.

LAND SURFACE ELEVATION: 282.04 ft above National Geodetic Vertical Datum of 1929.

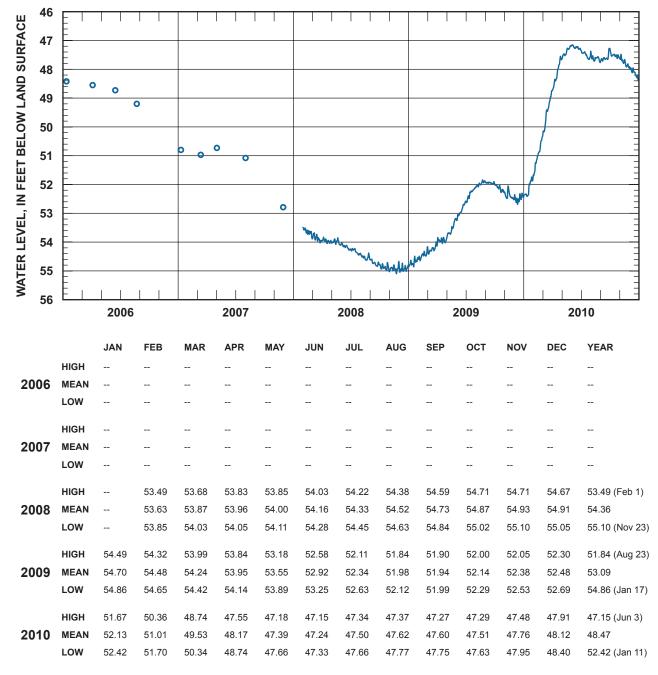
MEASURING POINT: Port in sanitary seal, 2.96 ft above land surface.

PERIOD OF RECORD: August 1996 to current year.

EXTREMES: Highest water level: 38.14 ft below land surface, June 3, 1998. Lowest water level: 59.77 ft below land surface, January 30, 2003.

REMARKS: Well-cluster site C-10. One of nine wells drilled on site for Department of Energy and

DNR project. Site is located near updip limit of Floridan aquifer (transition zone between



WELL NUMBER: ALL-0373 **LATITUDE**: 33° 01′ 29″ **GRID NUMBER:** 35AA-q6 **LONGITUDE:** 81° 23′ 03″

LOCATION: Allendale, 3.5 miles west (County Road 52).

AQUIFER: Floridan (Middle Floridan).

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WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 372 ft. Screened from 327 to 367 ft.

LAND SURFACE ELEVATION: 279.67 ft above National Geodetic Vertical Datum of 1929.

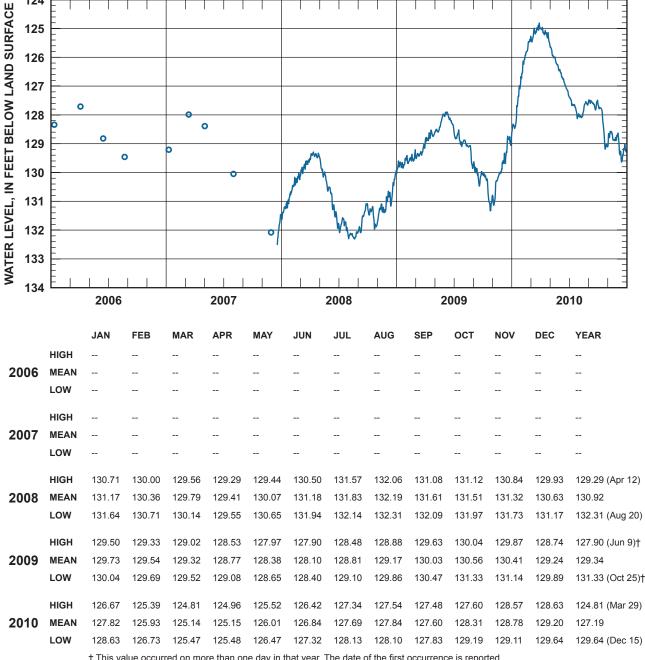
MEASURING POINT: Port in sanitary seal, 2.74 ft above land surface.

PERIOD OF RECORD: August 1996 to current year.

EXTREMES: Highest water level: 119.71 ft below land surface, May 8, 1998. Lowest water level: 133.86 ft below land surface, June 21, 2002.

REMARKS: Well-cluster site C-10. One of nine wells drilled on site for Department of Energy and

DNR project. Site is located near updip limit of Floridan aguifer (transition zone between



 WELL NUMBER: BRN-0350
 LATITUDE: 33° 10′ 45″

 GRID NUMBER: 34Y-x2
 LONGITUDE: 81° 18′ 51″

LOCATION: Barnwell, 4 miles southeast (S.C. Highway 300).

AQUIFER: Floridan (Upper Three Runs)

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 170 ft. Screened from 155 to 165 ft.

LAND SURFACE ELEVATION: 207.4 ft above National Geodetic Vertical Datum of 1929.

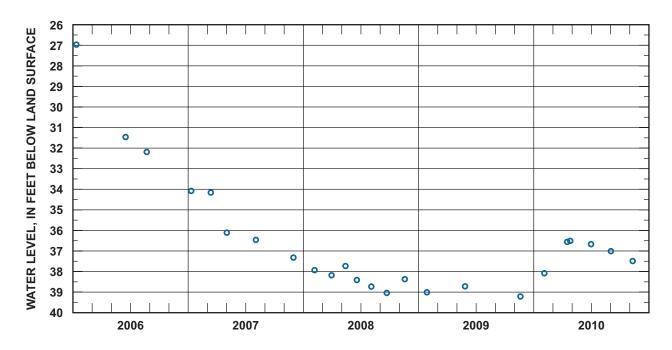
MEASURING POINT: Port in sanitary seal, 2.74 ft above land surface.

PERIOD OF RECORD: April 1988 to current year.

EXTREMES: Highest water level: 24.56 ft below land surface, May 13, 1993.

Lowest water level: 39.04 ft below land surface, September 22, 2008.

REMARKS: Well-cluster site C-6. One of eight wells drilled on site for Department of Energy and



WELL NUMBER: BRN-0351 **LATITUDE**: 33° 10′ 45″ **LONGITUDE:** 81° 18′ 51″ **GRID NUMBER:** 34Y-x3

LOCATION: Barnwell, 4 miles southeast (S.C. Highway 300).

AQUIFER: Floridan (Upper Three Runs).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 95 ft. Screened from 80 to 90 ft.

LAND SURFACE ELEVATION: 207.3 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in sanitary seal, 2.75 ft above land surface.

PERIOD OF RECORD: April 1988 to current year.

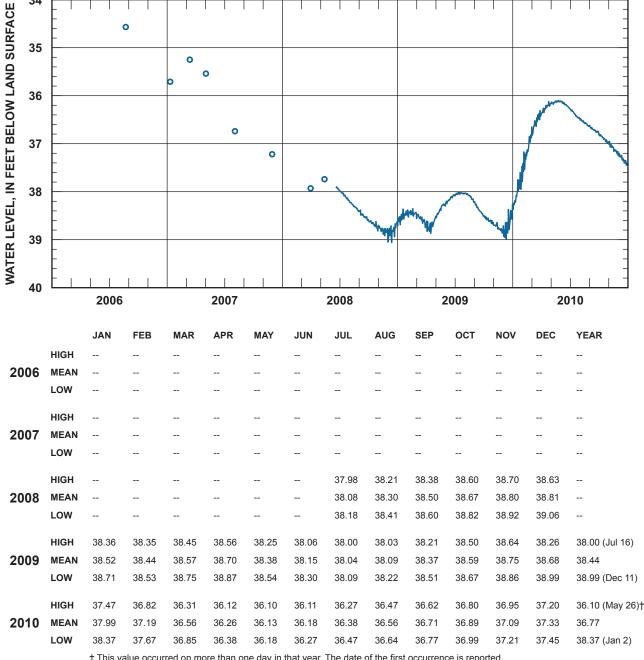
EXTREMES: Highest water level: 23.93 ft below land surface, May 12, 1993.

Lowest water level: 39.06 ft below land surface, December 13, 2008.

REMARKS: Well-cluster site C-6. One of eight wells drilled on site for Department of Energy and

DNR project.

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 WELL NUMBER: BFT-0101
 LATITUDE: 32° 10′ 08″

 GRID NUMBER: 27KK-y1
 LONGITUDE: 80° 44′ 26″

LOCATION: Hilton Head Island (U.S. Highway 278).

AQUIFER: Floridan (Upper Floridan).

WELL CHARACTERISTICS: 8-inch diameter observation well. Depth: 442 ft. Open hole below 129 ft.

LAND SURFACE ELEVATION: 14.31 ft above National Geodetic Vertical Datum of 1929.

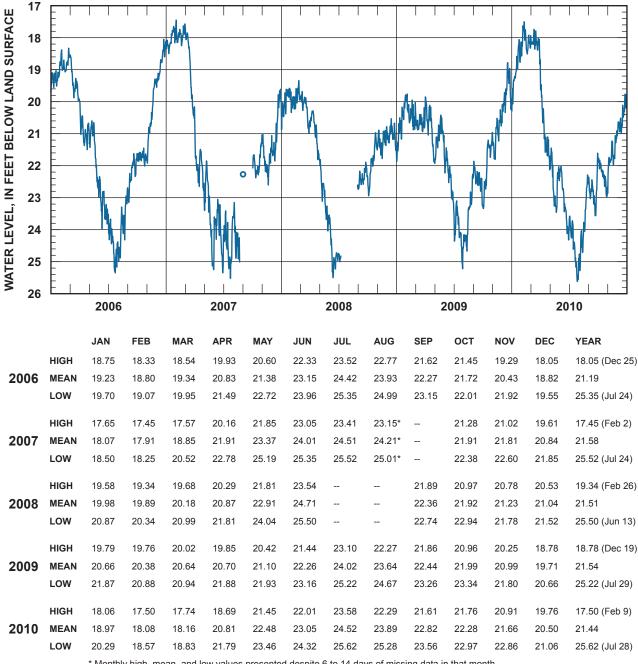
MEASURING POINT: Port in base of enclosure, 3.26 ft above land surface.

PERIOD OF RECORD: January 1955 to current year.

EXTREMES: Highest water level: 12.29 ft below land surface, July 5, 1961. Lowest water level: 30.42 ft below land surface, July 12, 1990.

REMARKS: Monitored continuously by USGS until September 2001, then by DNR to current year. Water

levels are influenced by tides. Manual measurement not corrected for tidal influence.



 $^{^{\}star}$ Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

WELL NUMBER: BFT-0429 **LATITUDE**: 32° 15′ 51″ **GRID NUMBER: 28JJ-y1 LONGITUDE:** 80° 49′ 11″

LOCATION: Bluffton, 2 miles northeast (Victoria Bluff Wildlife Management Area).

AQUIFER: Floridan (Upper Floridan).

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WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 300 ft. Open hole below 119 ft.

LAND SURFACE ELEVATION: 21.56 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 1.85 ft above land surface.

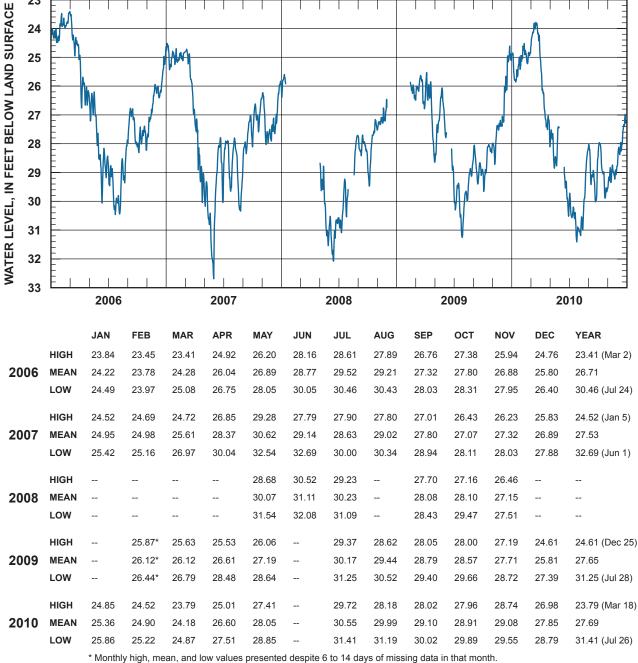
PERIOD OF RECORD: August 1970 to current year.

EXTREMES: Highest water level: 21.71 ft below land surface, September 10, 1971.

Lowest water level: 32.69 ft below land surface, June 1, 2007.

REMARKS: Monitored continuously by USGS until September 2001, then by DNR to current year. Water

levels are influenced by tides.



 WELL NUMBER: BFT-1809
 LATITUDE: 32° 16′ 02″

 GRID NUMBER: 27JJ-q2
 LONGITUDE: 80° 43′ 22″

LOCATION: Hilton Head Island (Hilton Head Plantation).

AQUIFER: Floridan (Middle Floridan).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 903 ft. Open hole below 227 ft.

LAND SURFACE ELEVATION: 11.75 ft above National Geodetic Vertical Datum of 1929.

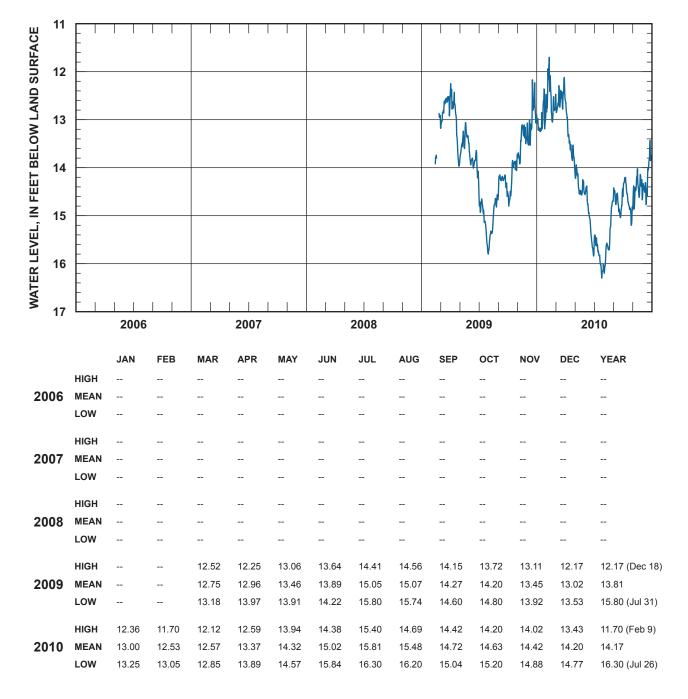
MEASURING POINT: Top of casing, 1.25 ft above land surface.

PERIOD OF RECORD: August 1986 to September 1994, then February 2009 to current year.

EXTREMES: Highest water level: 11.70 ft below land surface, February 9, 2010. Lowest water level: 16.30 ft below land surface, July 26, 2010.

REMARKS: Monitored by USGS until September 1994, then by DNR from February 2009 to current year.

Water levels are influenced by tides.



WELL NUMBER: BFT-1813 **LATITUDE:** 32° 13′ 59″ **GRID NUMBER:** 27KK-j5 **LONGITUDE:** 80° 40′ 37″

LOCATION: Hilton Head Island (Fort Walker at Port Royal Plantation).

AQUIFER: Floridan (Middle Floridan).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 600 ft. Open hole below 276 ft.

LAND SURFACE ELEVATION: 11.42 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in PVC instrument support, 0.20 ft above land surface.

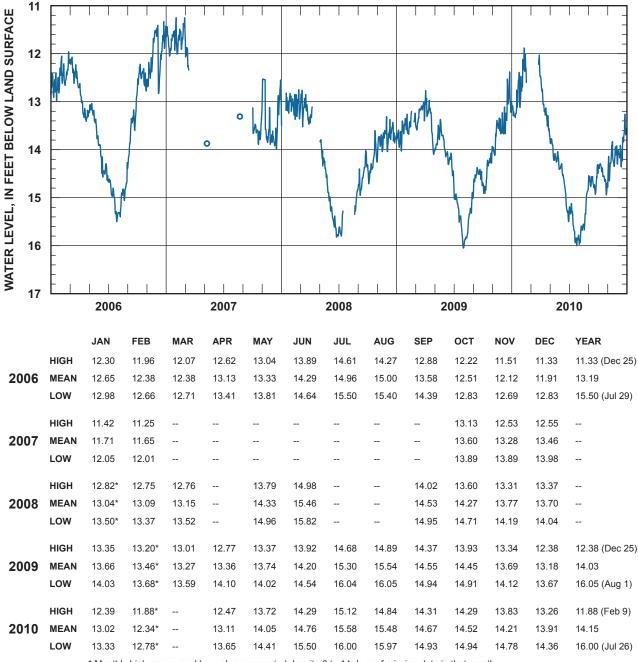
PERIOD OF RECORD: July 1991 to November 1993, then October 2001 to current year.

EXTREMES: Highest water level: 11.25 ft below land surface, February 2, 2007.

Lowest water level: 16.87 ft below land surface, September 18, 2003.

REMARKS: Water levels are influenced by tides. Monitored continuously by USGS until August 2003,

then by DNR to current year.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

 WELL NUMBER: BFT-1814
 LATITUDE: 32° 13′ 59″

 GRID NUMBER: 27KK-j6
 LONGITUDE: 80° 40′ 37″

LOCATION: Hilton Head Island (Fort Walker at Port Royal Plantation).

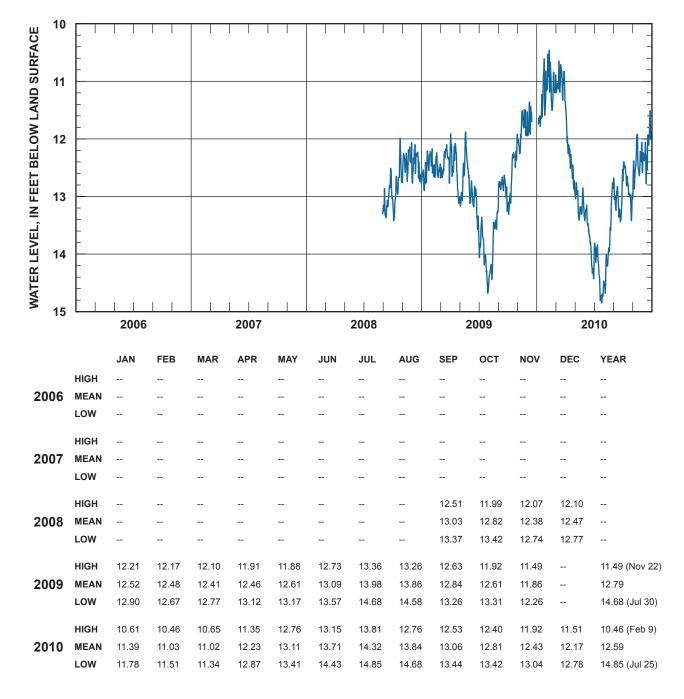
AQUIFER: Floridan (Upper Floridan).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 210 ft. Open hole below 120 ft. **LAND SURFACE ELEVATION:** 12 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in PVC instrument support, 0.25 ft above land surface. **PERIOD OF RECORD:** October 1986 to April 1999, then August 2008 to current year. **EXTREMES:** Highest water level: 10.46 ft below land surface, February 9, 2010. Lowest water level: 16.91 ft below land surface, July 1, 1998.

REMARKS: Water levels are influenced by tides. Monitored by USGS until April 1999, then by DNR

from August 2008 to current year.



 WELL NUMBER: BFT-1820
 LATITUDE: 32° 12′ 14″

 GRID NUMBER: 27KK-010
 LONGITUDE: 80° 44′ 59″

LOCATION: Hilton Head Island (Indigo Run Plantation).

AQUIFER: Floridan (Middle Floridan).

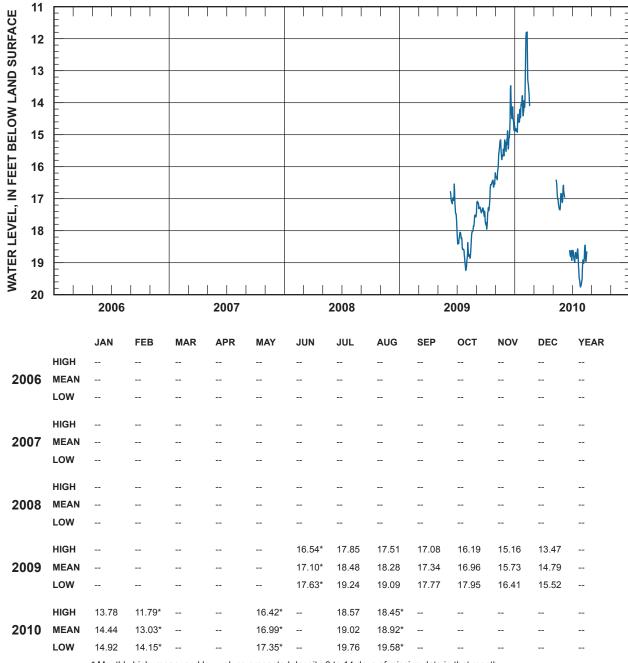
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 600 ft. Open hole below 316 ft.

LAND SURFACE ELEVATION: 9.8 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Port in PVC instrument support, 0.82 ft above land surface.

PERIOD OF RECORD: February 1992 to November 1993, then June 2009 to current year.

EXTREMES: Highest water level: 11.79 ft below land surface, February 9, 2010.

Lowest water level: 19.76 ft below land surface, July 28, 2010.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

 WELL NUMBER: BFT-1822
 LATITUDE: 32° 12′ 14″

 GRID NUMBER: 27KK-011
 LONGITUDE: 80° 44′ 58″

LOCATION: Hilton Head Island (Indigo Run Plantation).

AQUIFER: Floridan (Upper Floridan).

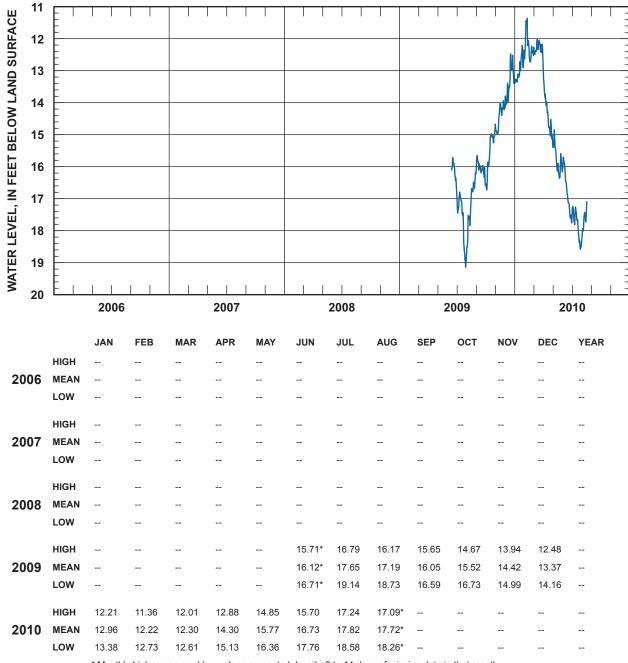
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 260 ft. Open hole below 91 ft.

LAND SURFACE ELEVATION: 9.6 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Port in PVC instrument support, 0.61 ft above land surface.

PERIOD OF RECORD: February 1992 to November 1993, then June 2009 to current year.

EXTREMES: Highest water level: 11.36 ft below land surface, February 9, 2010.

Lowest water level: 19.14 ft below land surface, July 29, 2009.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

WELL NUMBER: BFT-1845 **LATITUDE**: 32° 16′ 50″ **LONGITUDE:** 80° 49′ 18″ **GRID NUMBER:** 28JJ-p5

LOCATION: Bluffton, 2.5 miles northeast (Waddell Mariculture Center).

AQUIFER: Floridan (Middle Floridan).

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WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 600 ft. Open hole below 255 ft.

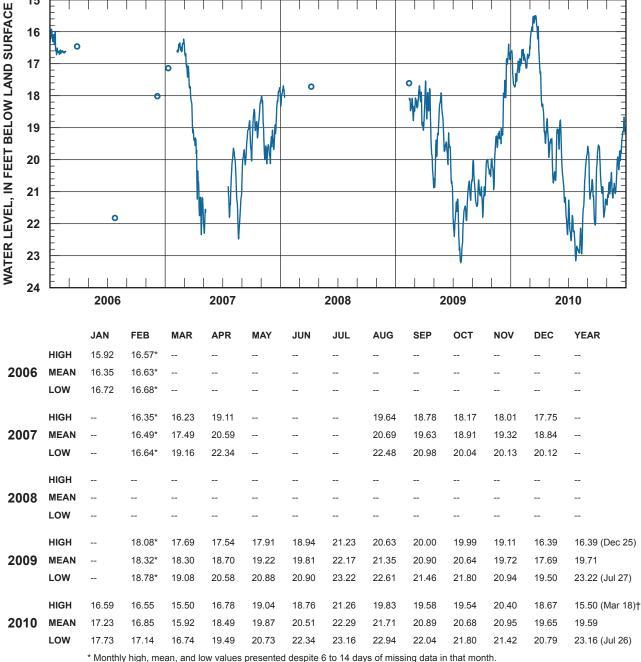
LAND SURFACE ELEVATION: 12.27 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in PVC instrument support, 2.98 ft above land surface.

PERIOD OF RECORD: February 1992 to current year.

EXTREMES: Highest water level: 15.50 ft below land surface, March 28, 2005 and March 18, 2010.

Lowest water level: 24.85 ft below land surface, June 18, 2002.



[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

 WELL NUMBER: BFT-1846
 LATITUDE: 32° 16′ 50″

 GRID NUMBER: 28JJ-p6
 LONGITUDE: 80° 49′ 18″

LOCATION: Bluffton, 2.5 miles northeast (Waddell Mariculture Center).

AQUIFER: Floridan (Upper Floridan).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 180 ft. Open hole below 85 ft.

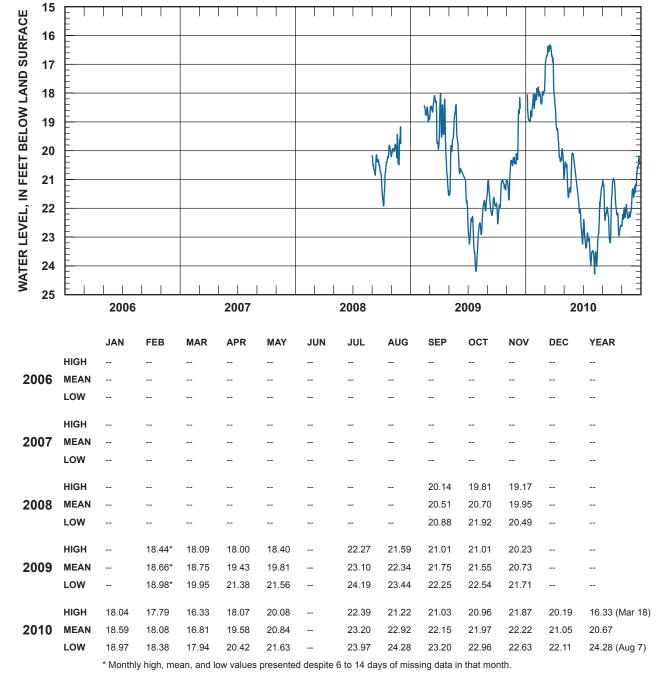
LAND SURFACE ELEVATION: 12.23 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in PVC instrument support, 3.10 ft above land surface.

PERIOD OF RECORD: February 1992 to March 1998, then August 2008 to current year.

EXTREMES: Highest water level: 15.39 ft below land surface, May 21, 1997.

Lowest water level: 24.28 ft below land surface, August 7, 2010.



BERKELEY COUNTY

 WELL NUMBER: BRK-0644
 LATITUDE: 33° 24′ 15″

 GRID NUMBER: 18W-b2
 LONGITUDE: 79° 56′ 02″

LOCATION: St. Stephen (St. Stephen Middle School).

AQUIFER: Floridan (Gordon).

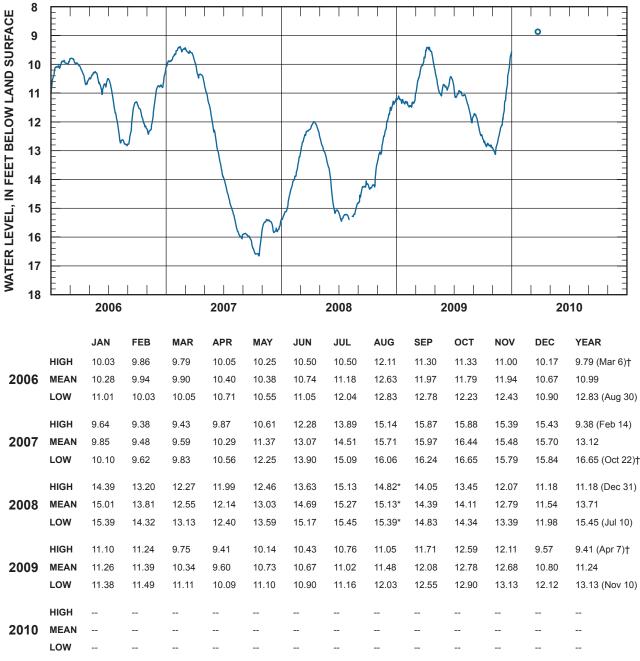
WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 93 ft. Screened from 53 to 93 ft. **LAND SURFACE ELEVATION:** 75 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of gray PVC instrument support, 3.00 ft above land surface.

PERIOD OF RECORD: January 2000 to current year.

EXTREMES: Highest water level: 8.52 ft below land surface, April 11, 2003. Lowest water level: 18.03 ft below land surface, July 20, 2002.

REMARKS: Drilled and cored for DNR/USGS aguifer delineation project.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

CHARLESTON COUNTY

WELL NUMBER: CHN-0044 **LATITUDE**: 32° 47′ 48″ **LONGITUDE:** 80° 04′ 13″ **GRID NUMBER: 19DD-01**

LOCATION: Charleston (U.S. Department of Agriculture site, U.S. Highway 17).

AQUIFER: Floridan and Tertiary sand (Middle Floridan and Gordon).

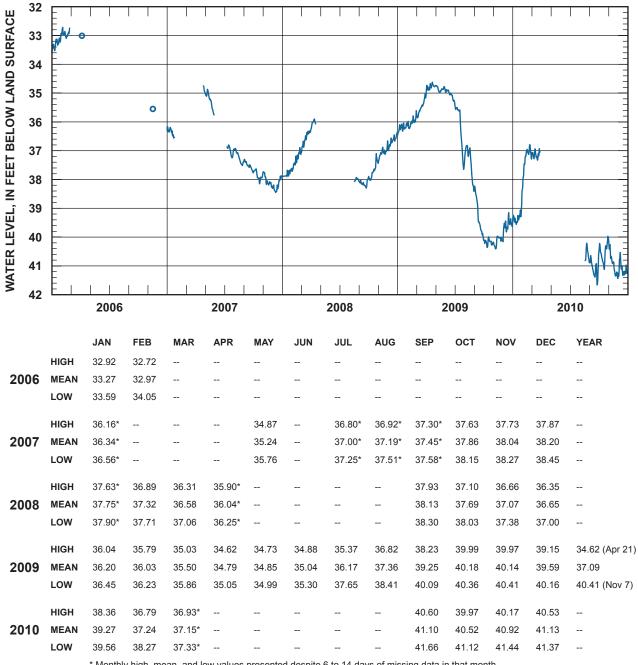
WELL CHARACTERISTICS: 8-inch diameter observation well. Depth: 434 ft. Open hole below 180 ft.

LAND SURFACE ELEVATION: 9.4 ft above National Geodetic Vertical Datum of 1929. **MEASURING POINT:** Top of polyboard at base of housing, 0.65 ft above land surface.

PERIOD OF RECORD: October 1980 to current year.

EXTREMES: Highest water level: 13.54 ft below land surface, March 18, 1983. Lowest water level: 41.66 ft below land surface, September 25, 2010.

REMARKS: Monitored continuously by USGS until November 2001, then by DNR to current year.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

CHARLESTON COUNTY

 WELL NUMBER: CHN-0484
 LATITUDE: 32° 34′ 53″

 GRID NUMBER: 22GG-d1
 LONGITUDE: 80° 18′ 20″

LOCATION: Edisto Beach, 5 miles north (Blue House Plantation).

AQUIFER: Floridan (Gordon confining unit).

WELL CHARACTERISTICS: 12-inch diameter unused irrigation well. Depth: 560 ft. Open hole below

280 ft.

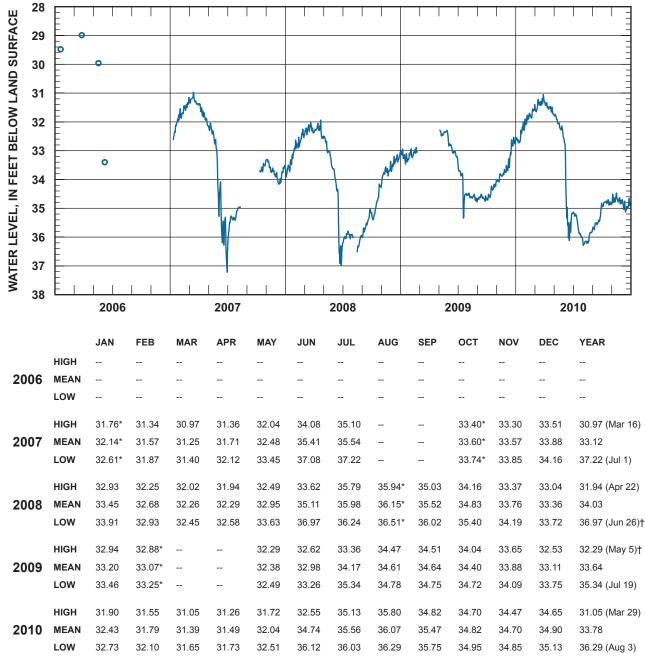
LAND SURFACE ELEVATION: 14.45 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port at base of enclosure, 2.07 ft above land surface.

PERIOD OF RECORD: February 2000 to current year.

EXTREMES: Highest water level: 20.31 ft below land surface, April 21, 2000. Lowest water level: 37.22 ft below land surface, July 1, 2007.

REMARKS: Water levels are influenced by tides. Manual measurements have not been corrected for tidal influences.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

CHARLESTON COUNTY

WELL NUMBER: CHN-0803 **LATITUDE**: 33° 09′ 20″ **LONGITUDE**: 79° 21′ 50″ GRID NUMBER: 11Z-b1

LOCATION: McClellanville, 7 miles northeast (Santee Coastal Reserve).

AQUIFER: Floridan (Gordon).

WELL CHARACTERISTICS: 5-inch diameter observation well. Depth: 112 ft. Screened from 48 to 112 ft.

LAND SURFACE ELEVATION: 10.89 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of casing, 2.46 ft above land surface.

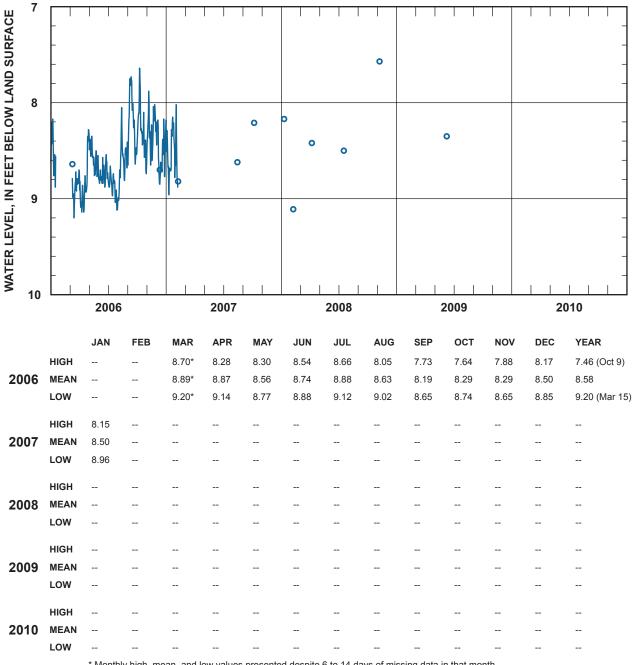
PERIOD OF RECORD: June 2000 to current year.

EXTREMES: Highest water level: 6.54 ft below land surface, March 30, 2003. Lowest water level: 9.72 ft below land surface, February 2, 2001.

REMARKS: Drilled and cored for DNR/USGS aquifer delineation project. Water levels influenced by tides.

Manual measurements have not been corrected for tidal influences. Hydraulic connection to the

South Santee River.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

COLLETON COUNTY

 WELL NUMBER: COL-0016
 LATITUDE: 32° 53′ 55″

 GRID NUMBER: 26CC-f1
 LONGITUDE: 80° 39′ 57″

LOCATION: Walterboro (Moore Street).

AQUIFER: Floridan and Tertiary sand (Middle Floridan and Gordon).

WELL CHARACTERISTICS: 6-inch diameter unused public supply well. Depth: 528 ft. Open hole

below 68 ft.

LAND SURFACE ELEVATION: 61.50 ft above National Geodetic Vertical Datum of 1929.

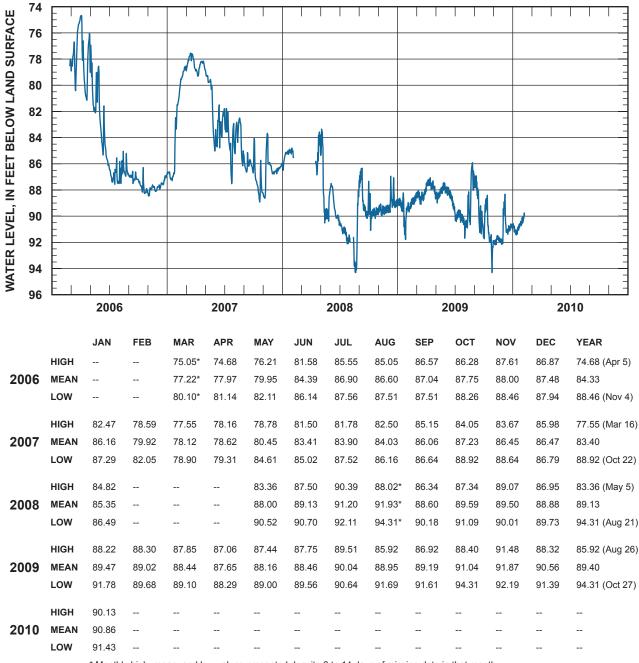
MEASURING POINT: Top of sanitary seal, 1.06 ft above land surface.

PERIOD OF RECORD: June 1995 to February 2010.

EXTREMES: Highest water level: 64.42 ft below land surface, February 16, 1996.

Lowest water level: 94.31 ft below land surface, August 21, 2008 and October 27, 2009.

REMARKS: Measurements discontinued in February 2010. Well has been plugged and abandoned.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

COLLETON COUNTY

 WELL NUMBER: COL-0097
 LATITUDE: 33° 02′ 52″

 GRID NUMBER: 26AA-k1
 LONGITUDE: 80° 35′ 51″

LOCATION: Walterboro, 10 miles north-northeast (S.C. Highway 61).

AQUIFER: Floridan (Middle Floridan and Gordon).

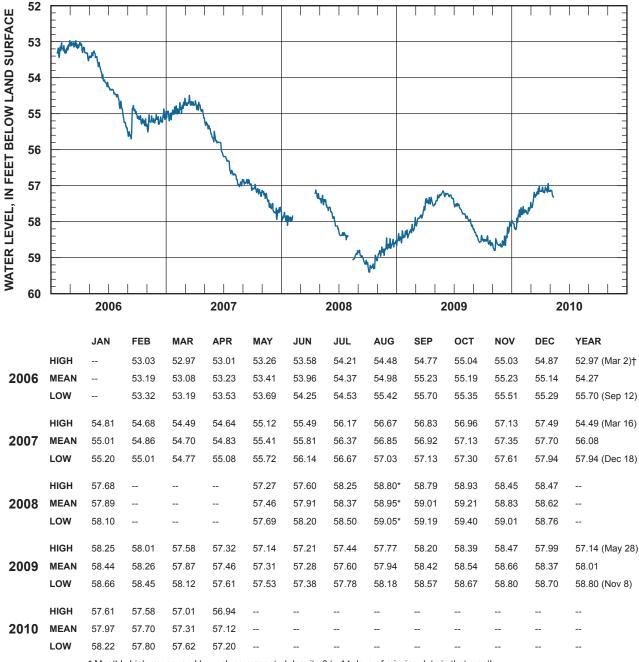
WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 342 ft. Open hole below 132 ft. **LAND SURFACE ELEVATION:** 84 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Top of sanitary seal, 1.78 ft above land surface.

PERIOD OF RECORD: September 1977 to current year.

EXTREMES: Highest water level: 36.79 ft below land surface, January 25, 1978. Lowest water level: 59.40 ft below land surface, October 7, 2008.

REMARKS: Monitored continuously by USGS until November 2001, then by DNR to current year.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

COLLETON COUNTY

 WELL NUMBER: COL-0301
 LATITUDE: 32° 30′ 42″

 GRID NUMBER: 22GG-w4
 LONGITUDE: 80° 17′ 57″

LOCATION: Edisto Beach (Edisto Beach State Park).

AQUIFER: Floridan (Gordon confining unit).

WELL CHARACTERISTICS: 6-inch diameter unused public supply well. Depth: 545 ft. Open hole below

516 ft.

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LAND SURFACE ELEVATION: 9.96 ft above National Geodetic Vertical Datum of 1929.

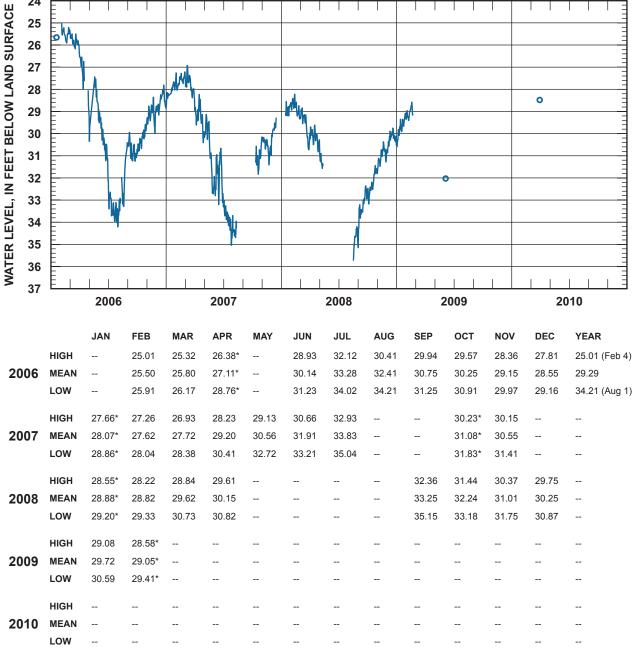
MEASURING POINT: Port at base of enclosure, 2.51 ft above land surface.

PERIOD OF RECORD: February 2000 to current year.

EXTREMES: Highest water level: 19.12 ft below land surface, March 9, 2000.

Lowest water level: 35.71 ft below land surface, August 17, 2008.

REMARKS: Water levels are influenced by tides. Specific conductance is also measured at this site.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

HAMPTON COUNTY

WELL NUMBER: HAM-0083 LATITUDE: 32° 41′ 52″ **GRID NUMBER: 29EE-s1 LONGITUDE**: 80° 51′ 03″

LOCATION: Yemassee (near intersection of Old Salkehatchie Highway and North Church Street).

AQUIFER: Floridan (Upper Floridan).

WELL CHARACTERISTICS: 4-inch diameter observation well. Depth: 113 ft. Open hole below 85 ft. LAND SURFACE ELEVATION: 45 ft (map estimate) above National Geodetic Vertical Datum of 1929.

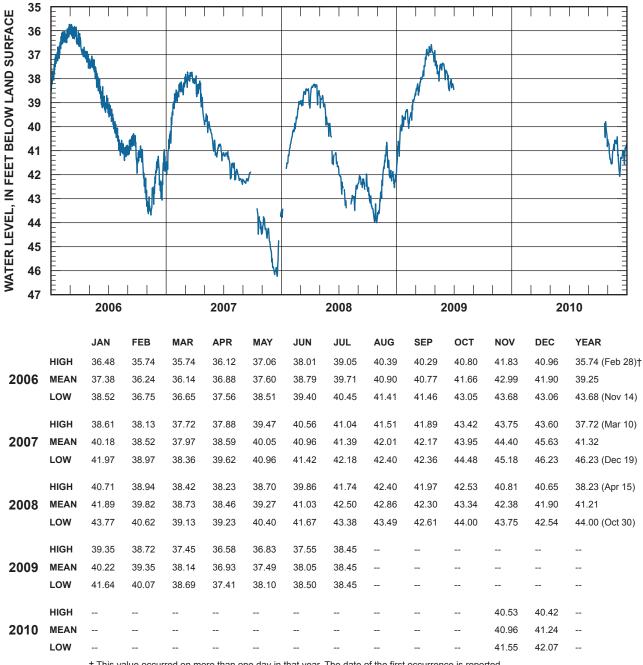
MEASURING POINT: Top of plywood instrument support, 2.05 ft above land surface.

PERIOD OF RECORD: February 1976 to December 2009, then October 2010 to current year.

EXTREMES: Highest water level: 32.05 ft below land surface, May 22, 1980.

Lowest water level: 46.23 ft below land surface, December 19, 2007.

REMARKS: Monitored by USGS until December 2009, then by DNR from October 2010 to current year.



JASPER COUNTY

WELL NUMBER: JAS-0425 **LATITUDE:** 32° 37′ 05″ **CRID NUMBER:** 30FF-01 **LONGITUDE:** 80° 59′ 43″

LOCATION: Ridgeland, 9 miles north-northwest (U.S. Highway 278).

AQUIFER: Floridan (Upper Floridan).

WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 225 ft. Open hole below 148 ft.

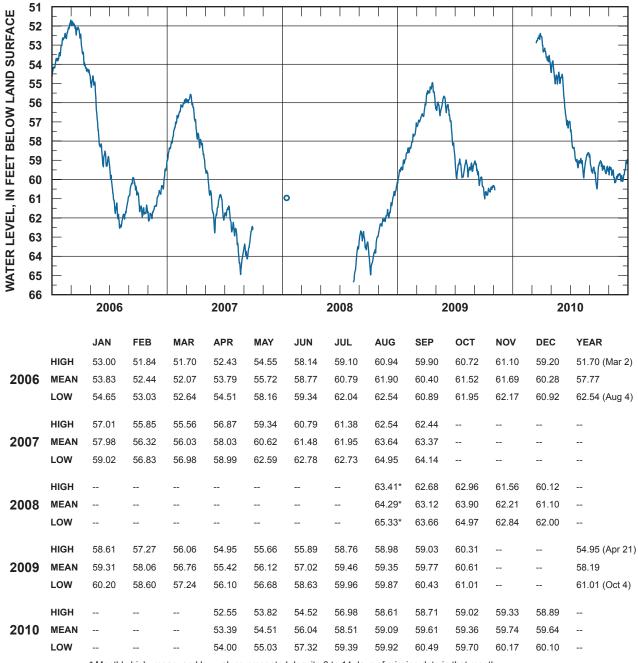
LAND SURFACE ELEVATION: 64.10 ft above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 1.97 ft above land surface.

PERIOD OF RECORD: April 2000 to current year.

EXTREMES: Highest water level: 51.70 ft below land surface, March 2, 2006. Lowest water level: 66.38 ft below land surface, June 18, 2002.

REMARKS: One of two wells drilled on site for Department of Energy and DNR project.



^{*} Monthly high, mean, and low values presented despite 6 to 14 days of missing data in that month.

JASPER COUNTY

WELL NUMBER: JAS-0492 **LATITUDE:** 32° 37′ 05″ **GRID NUMBER:** 30FF-03 **LONGITUDE:** 80° 59′ 43″

LOCATION: Ridgeland, 9 miles north-northwest (U.S. Highway 278).

AQUIFER: Floridan (Middle Floridan).

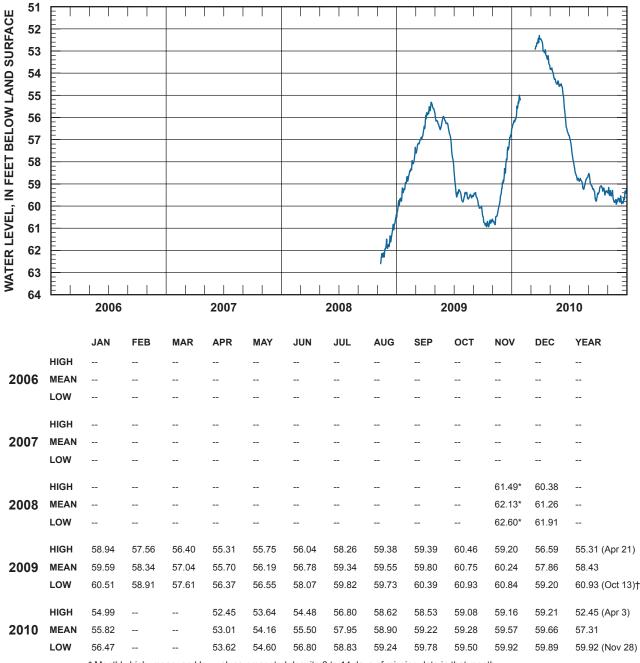
WELL CHARACTERISTICS: 6-inch diameter observation well. Depth: 600 ft. Open hole below 290 ft. **LAND SURFACE ELEVATION:** 65 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in PVC instrument support, 2.66 ft above land surface.

PERIOD OF RECORD: November 2008 to current year.

EXTREMES: Highest water level: 52.30 ft below land surface, March 29, 2010. Lowest water level: 62.60 ft below land surface, November 11, 2008.

REMARKS:



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[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

ORANGEBURG COUNTY

WELL NUMBER: ORG-0431 **LATITUDE:** 33° 30′ 30″ **GRID NUMBER:** 29U-v3 **LONGITUDE**: 80° 51′ 54″

LOCATION: Orangeburg (Clark Middle School). AQUIFER: Floridan (Upper Three Runs).

WELL CHARACTERISTICS: 2-inch diameter observation well. Depth: 93 ft. Screened from 83 to 88 ft. LAND SURFACE ELEVATION: 256 ft (map estimate) above National Geodetic Vertical Datum of 1929.

MEASURING POINT: Port in base of enclosure, 3.13 ft above land surface.

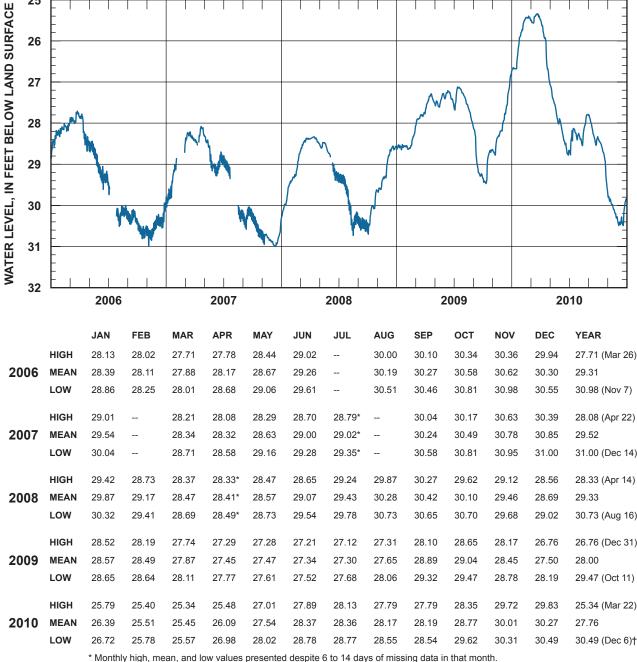
PERIOD OF RECORD: March 2001 to current year.

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EXTREMES: Highest water level: 25.34 ft below land surface, March 22, 2010.

Lowest water level: 33.82 ft below land surface, September 25, 2002.

REMARKS: Drilled for DNR/USGS aguifer delineation project.



[†] This value occurred on more than one day in that year. The date of the first occurrence is reported.

