

Potentiometric Surface of the Black Creek Aquifer in South Carolina, November 2012

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The Black Creek aquifer is the source of water for many public, industrial, and agricultural supplies in much of the Coastal Plain of South Carolina. This important water resource is monitored by regularly measuring the nonpumping water levels in wells. The potentiometric surface of an aquifer is defined by the elevations at which water stands in tightly cased wells completed in the aquifer.

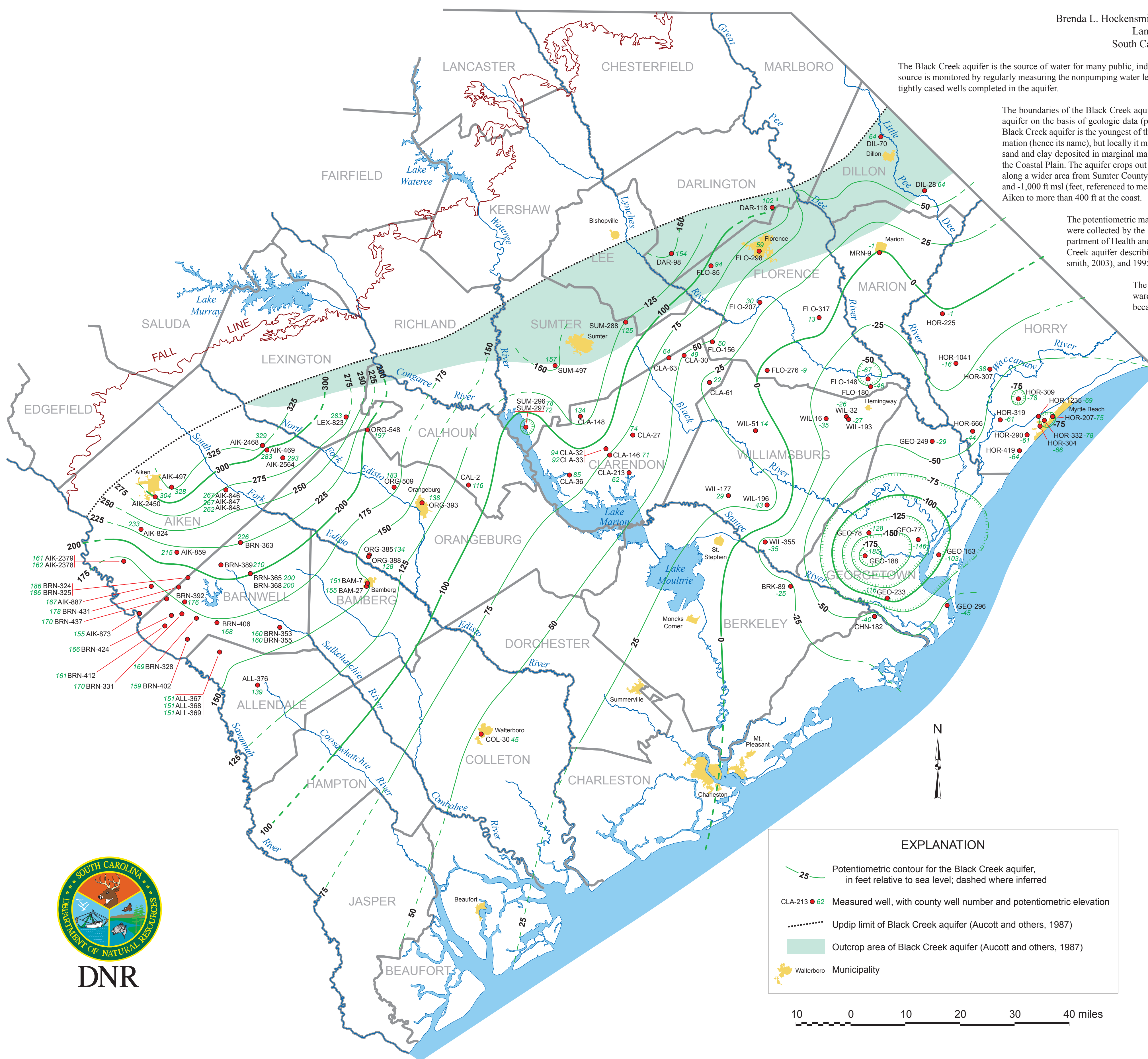
The boundaries of the Black Creek aquifer used in this investigation are those defined by Aucott, Davis, and Speiran (1987), who delineated the aquifer on the basis of geologic data (primarily geophysical well logs, water-level data, water-chemistry data, and previous investigations). The Black Creek aquifer is the youngest of the Cretaceous aquifers in the region. It is composed mostly of permeable sediments of the Black Creek Formation (hence its name), but locally it may include sediments from underlying or overlying formations. The aquifer comprises thin- to thick-bedded sand and clay 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 and 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, -300, and -1,000 ft msl (feet, referenced to mean sea level) at Aiken, Myrtle Beach, and Charleston, respectively. Thickness ranges from about 100 ft near Aiken to more than 400 ft at the coast.

The potentiometric map presented here was constructed by using water levels measured in 100 wells in late 2012 (see table). Data were collected by the South Carolina Department of Natural Resources, the U.S. Department of Energy, the South Carolina Department of Health and Environmental Control, and the U.S. Geological Survey. Similar maps have been produced for the Black Creek aquifer describing the potentiometric surface in 2009 (Hockensmith, 2012), 2004 (Hockensmith, 2008), 2001 (Hockensmith, 2003), and 1995 (Hockensmith, 1997).

The potentiometric surface of the Black Creek aquifer for November 2012 shows that the generally southeastward groundwater flow is affected by several potentiometric lows. These cones of depression have developed because of groundwater pumping in Georgetown, Florence, and Williamsburg Counties.

References

- Aucott, W.R., Davis, M.E., and Speiran, G.K., 1987, Geohydrologic framework of the Coastal Plain aquifers of South Carolina: U.S. Geological Survey Water-Resources Investigations Report 85-4271, 7 sheets.
- Hockensmith, B.L., 1997, Potentiometric surface of the Black Creek aquifer in South Carolina, November 1995: South Carolina Department of Natural Resources, Water Resources Report 16, 1 sheet.
- 2003, Potentiometric surface of the Black Creek aquifer in South Carolina, November 2001: South Carolina Department of Natural Resources, Water Resources Report 29, 1 sheet.
- 2008, Potentiometric surface of the Black Creek aquifer in South Carolina, November 2004: South Carolina Department of Natural Resources, Water Resources Report 47, 10 p., 1 plate.
- 2012, Potentiometric surface of the Black Creek aquifer in South Carolina, November 2009: South Carolina Department of Natural Resources, Water Resources Report 52, 9 p., 1 plate.



EXPLANATION

- 25 — Potentiometric contour for the Black Creek aquifer, in feet relative to sea level; dashed where inferred
- CLA-213 ● 62 Measured well, with county well number and potentiometric elevation
- Updip limit of Black Creek aquifer (Aucott and others, 1987)
- Outcrop area of Black Creek aquifer (Aucott and others, 1987)
- ★ Waterboro Municipality

Well ID	Well ID	Latitude	Longitude	Water level	Well ID	Well ID	Latitude	Longitude	Water level
county	county	(decimal	(decimal	elevation	county	county	(decimal	(decimal	elevation
number	number	degrees)	degrees)	(ft msl)	number	number	degrees)	degrees)	(ft msl)
AIK-469	35T-33	33.64872	-81.35569	283	COL-30	27CC-1	32.89583	-80.67778	45
AIK-497	38U-11	33.55028	-81.65722	328	DAR-98	19M-2	34.16944	-80.76222	154
AIK-824	40V-45	33.43778	-81.75417	233	DAR-118	15L-03	34.28906	-79.74694	102
AIK-846	36U-03	33.54222	-81.48556	267	DIL-28	10L-01	34.32944	-79.26472	64
AIK-847	36U-04	33.54222	-81.48556	267	DIL-70	11J-11	34.47306	-79.40139	64
AIK-848	36U-05	33.54222	-81.48556	262	FLO-85	18I-11	34.13500	-79.94194	94
AIK-859	38W-02	33.37725	-81.64086	215	FLO-148	12R-33	33.83111	-79.44444	-67
AIK-873	40Y-08	33.21438	-81.75898	155	FLO-156	18P-11	33.93306	-79.93972	50
AIK-887	39X-03	33.28678	-81.72213	167	FLO-180	12R-11	33.81028	-79.43944	-46
AIK-2378	40W-02	33.35250	-81.81000	161	FLO-207	16O-02	34.03611	-79.78889	30
AIK-2379	40W-03	33.35333	-81.80917	162	FLO-276	16Q-02	33.85611	-79.76667	-9
AIK-2450	39U-06	33.52472	-81.70889	304	FLO-298	16M-06	34.17222	-79.78889	59
AIK-2468	35T-01	33.66053	-81.36981	329	FLO-317	14P-01	33.99444	-79.80139	13
AIK-2564	34T-06	33.62806	-81.30556	293	GEO-77	10W-01	33.40417	-79.29306	-146
ALL-367	37Z-08	33.11333	-81.50611	151	GEO-78	12V-01	33.42389	-79.44917	-128
ALL-368	37Z-09	33.11361	-81.50556	151	GEO-153	9W-02	33.36333	-79.22833	-103
ALL-369	37Z-10	33.11306	-81.50583	151	GEO-188	12W-01	33.36194	-79.46167	-185
ALL-376	35AA-09	33.02472	-81.38500	139	GEO-233	11Y-03	33.24972	-79.38222	-116
BAM-7	31X-03	33.29500	-81.03750	151	GEO-249	9T-01	33.66278	-79.24639	-29
BAM-27	31X-06	33.28694	-81.04111	155	GEO-296	9Y-02	33.22750	-79.20500	-45
BRK-89	15X-01	33.28493	-79.69436	-25	HOR-207	5S-11	33.71777	-78.85954	-75
BRN-324	38X-03	33.31070	-81.60628	196	HOR-225	9P-02	33.99861	-79.20389	-61
BRN-325	38X-04	33.31056	-81.60611	196	HOR-290	6S-02	33.67056	-78.93972	-1
BRN-328	37Y-05	33.20238	-81.57804	169	HOR-304	5S-02	33.69361	-78.89763	-66
BRN-331	33Y-04	33.21422	-81.62386	170	HOR-307	7Q-02	33.84944	-79.05750	-38
BRN-353	34Y-05	33.17861	-81.31500	160	HOR-309	6R-03	33.76861	-78.96750	-78
BRN-355	34Y-07	33.17889	-81.31528	160	HOR-319	7S-11	33.71222	-79.02389	-61
BRN-363	36W-01	33.40336	-81.43931	226	HOR-332	5S-02	33.71184	-78.88626	-78
BRN-365	35X-05	33.32083	-81.40778	200	HOR-419	6T-01	33.62994	-78.96492	-64
BRN-368	35X-08	33.32056	-81.40778	200	HOR-666	8S-04	33.68800	-79.11840	-44
BRN-389	37W-08	33.34465	-81.50030	210	HOR-1041	8Q-02	33.86492	-79.16356	-16
BRN-392	38Y-04	33.24604	-81.61619	176	HOR-1235	5S-04	33.72139	-78.90278	-69
BRN-402	36Z-08	33.14682	-81.60749	159	LEX-823	32S-03	33.73578	-81.10542	283
BRN-406	37Y-04	33.19120	-81.51336	168	MRN-9	11M-02	34.16583	-79.40833	-1
BRN-412	39-04	33.18250	-81.67889	161	ORG-385	31W-06	33.36889	-81.03083	134
BRN-424	38Y-011	33.21089	-81.65756	166	ORG-388	31W-03	33.36361	-81.03417	128
BRN-431	38X-059	33.28595	-81.63501	178	ORG-393	29U-01	33.50833	-80.86500	138
BRN-437	39X-08	33.25308	-81.67260	170	ORG-509	30U-01	33.55011	-80.95381	183
CAL-2	27U-02	33.55639	-80.71778	116	ORG-548	31S-01	33.70342	-81.03572	197
CHN-182	12Y-11	33.20106	-79.43525	-40	SUM-288	21P-03	33.95883	-80.21333	125
CLA-27	21S-01	33.68825	-80.19344	74	SUM-296	25S-11	33.71056	-80.53222	78
CLA-30	19Q-03	33.88544	-80.01008	49	SUM-297	25S-02	33.71056	-80.53222	72
CLA-32	22T-01	33.65175	-80.28008	94	SUM-497	24Q-02	33.87444	-80.43778	157
CLA-33	22T-02	33.65147	-80.27997	92	WIL-16	13-11	33.72667	-79.51339	-35
CLA-36	23U-01	33.58147	-80.39419	85	WIL-32	13S-11	33.73083	-79.51722	-26
CLA-61	18R-01	33.82600	-79.94919	22	WIL-51	16R-02	33.69639	-79.80722	14
CLA-63	19Q-11	33.89231	-80.07782	64	WIL-177	17U-01	33.52481	-79.89211	29
CLA-146	22T-11	33.63544	-80.26672	71	WIL-193	13S-02	33.72167	-79.51000	-27
CLA-148	23S-02	33.73828	-80.35828	134	WIL-196	16U-01	33.49889	-79.77028	43
CLA-213	21T-04	33.58872	-80.20608	62	WIL-355	16W-02	33.40252	-79.77831	-35

