HYDROGEOLOGIC INVESTIGATION AND ESTABLISHMENT OF A PERMANENT MULTI-OBSERVATONAL WELL NETWORK IN AIKEN, ALLENDALE, AND BARNWELL COUNTIES, SOUTH CAROLINA—PHASE VIII

STATE OF SOUTH CAROLINA
DEPARTMENT OF NATURAL RESOURCES
WATER RESOURCES DIVISION
OPEN-FILE REPORT 3
FEBRUARY 1996

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by

Joseph A. Gellici and Constance E. Gawne

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DEPARTMENT OF NATURAL RESOURCES

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FEBRUARY 1996

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ABSTRACT

The Lower Savannah River Project was established in 1986 to improve our understanding of the hydrogeologic conditions in west-central South Carolina. Six progress reports have been written since 1987. This report covers the period from July 1, 1994, to June 30, 1995. During the current phase, work focused on locating and procuring suitable sites for future well clusters; drafting well-construction specifications and bid packages; drilling monitoring wells at site C-7; and completing two comprehensive reports.

Land was acquired for three future well-cluster sites: C-11, C-13, and C-15. Site C-11 will be located at the Oakwood Fire Tower in Aiken County. This land was made available through the South Carolina Forestry Commission. Land for site C-13 was donated by the Wildlife Division of the South Carolina Department of Natural Resources and will be located at Little Hell Landing on the Savannah River flood plain southwest of Millet in Allendale County. Site C-15 will be located at Gillisonville in northern Jasper County. A 0.9-acre parcel of land was purchased from Westvaco, Inc., for this site.

Well specifications and bid packages were drawn up for the construction of seven monitoring wells at site C-10, three at C-13, and two at C-15. Specifications for continuously coring a well at site C-11 were also completed.

Specific-capacity values of nine wells at site C-7 range from 0.3 to 20.6 gpm/ft (gallons per minute per foot of drawdown). Specific-capacity values of four wells at site C-1 range from 0.5 to 8.6

gpm/ft. Two deep Cretaceous wells were drilled at site C-7, one each in the Midville and Dublin aquifer systems. An upward hydraulic gradient exists between the aquifers.

Two comprehensive reports were completed during this phase of the project: 1) a compilation and interpretation of data collected from the project since its inception in 1986, and 2) a detailed description of the hydrogeologic framework of west-central South Carolina and the hydrologic characteristics of the aquifers and confining units.

INTRODUCTION

The South Carolina Department of Natural Resources, Water Resources Division (SCDNR-WRD), in collaboration with the United States Department of Energy (USDOE), is conducting a hydrogeologic investigation of the ground-water system peripheral to the Savannah River Site (SRS). The investigation, known as the Lower Savannah River Project, commenced in 1986 and is scheduled to continue through 1997. Annual progress reports have documented the drilling and analytical activities that occurred during various phases of the investigation (Logan, 1987; Kuntz and Griffin, 1988; Kuntz and others, 1989; Gellici, 1990; Simones, 1992; Gellici and others, 1995).

This progress report (Phase VIII) covers the period between July 1, 1994 and June 30, 1995. During this phase of the project, work was done mainly: 1) locating and buying suitable parcels of land for future cluster sites, 2) preparing specifications and bid packages for future drilling, 3) completing comprehensive technical reports, and 4) completing well installation at site C-7.

The framework of the investigation is a well-cluster network comparable to one constructed on SRS (Bledsoe, 1984, 1987, and 1988). Locations of the cluster sites were selected by SCDNR-WRD and USDOE personnel on the basis of study objectives, proximity to the plant's borders, land availability, and the need to space sites along the entire length of the border to optimize hydrogeologic control. At each cluster site, one well is continuously cored and geophysically logged from land surface

to 10 ft (feet) into unweathered, crystalline basement rock. Data obtained from the core and logs are used to delineate the aquifer and confining units in the area. One to three monitoring wells are then completed in each major aquifer.

Presently (1996), seven sites have been established; three in Aiken County, two in Barnwell County, and two in Allendale County (Fig. 1). More than 7,200 ft of sediments have been cored and 41 monitoring wells constructed (Table 1). Most of the wells are equipped with automatic, digital water-level recorders and submersible pumps.

Data generated from this project, in conjunction with data acquired on and off the Savannah River Site, will be used to characterize the hydrologic units and to construct a detailed hydrogeologic framework of west-central South Carolina. The project will also provide a long-term observation network to: continually monitor water levels, head relationships, and flow paths; monitor water quality; and detect changes in these parameters as ground-water pumpage changes in the area.

SCOPE OF WORK FOR PHASE VIII

Phase VIII of the project consisted of locating and acquiring or leasing suitable parcels of land for future cluster sites C-11, C-13, and C-15 (Fig. 2); drafting specifications and preparing bid packages for the construction of seven additional wells at existing site C-10 and for three wells at site C-13; drafting specifications for continuously coring a well at site C-11; drafting specifications for high resolution geophysical logging at site C-10; drilling two monitoring wells at site C-7; and, determining specific capacity values of wells at sites C-1 and C-7. In addition, efforts were spent on completing two comprehensive reports on the geology and hydrology of the C-well clusters (Gellici and others, 1995) and on the hydrogeologic framework of west-central South Carolina (Aadland and others, 1995).

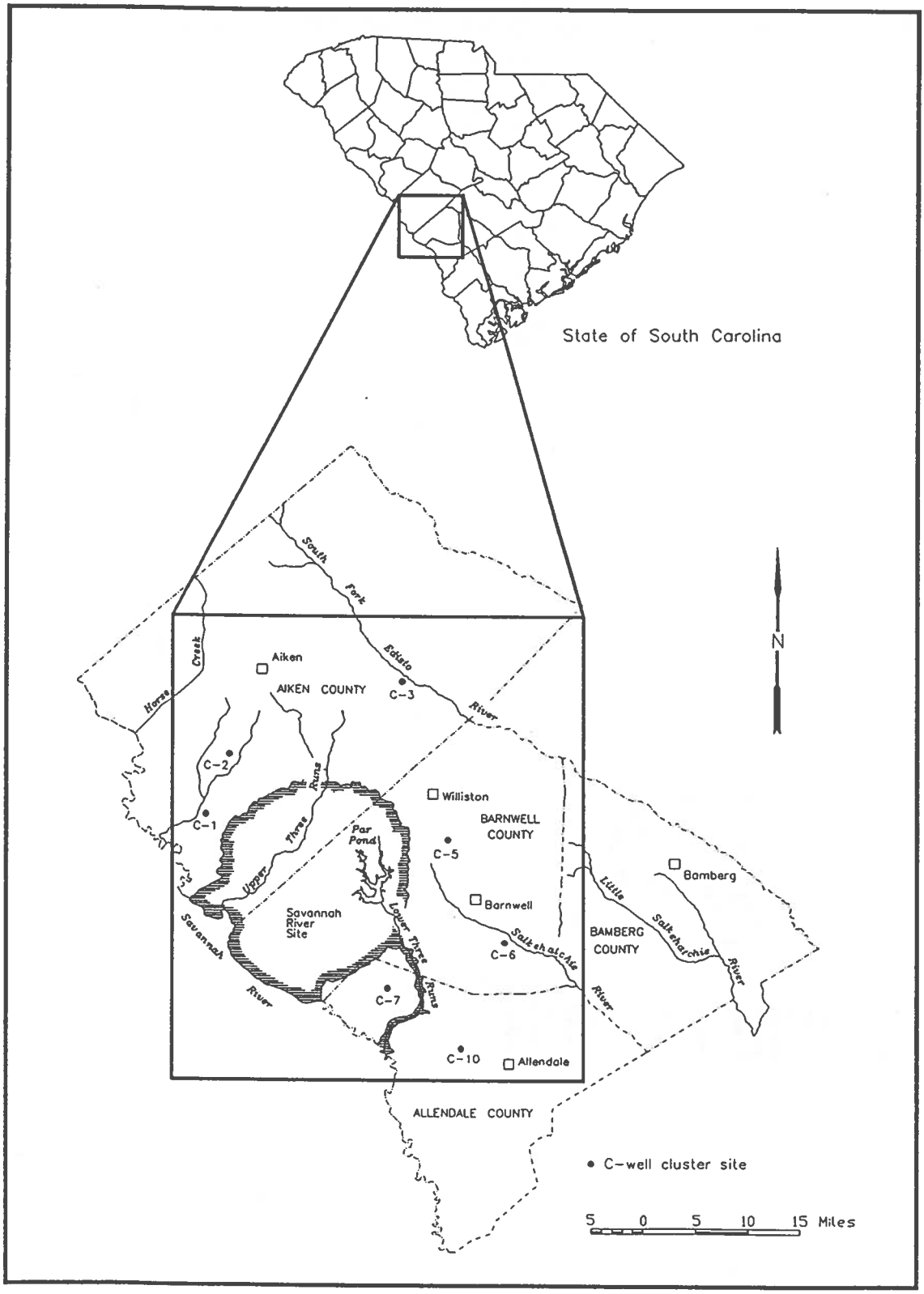

Figure 1. Location of existing well-cluster sites in the vicinity of SRS, 1996.

Table 1. Summary of well-construction data for the "C" wells, 1996

Well site	Well / grid	Latitude	Longitude	Land surface altitude (ft, msl)	Well depth (ft)	Top of screen (ft, lsd)	Bottom of screen (ft, lsd)	Hydrologic unit	Hydrologic system	Formation
C-1	AIK-2378 40W-q2	33 21 09	81 48 36	235 (T)	185	170	180	Crouch Branch aquifer	Dublin-Midville	Black Creek
C-1	AIK-2379 40W-q3	33 21 09	81 48 36	235 (T)	266	251	261	Crouch Branch aquifer	Dublin-Midville	Black Creek
C-1	AIK-2380 40W-q4	33 21 10	81 48 35	235 (T)	385	370	380	McQueen Br. aquifer	Dublin-Midville	Middendorf
C-1	AIK-902 40W-q1	33 21 10	81 48 35	235 (T)	511	496	506	McQueen Br. aquifer	Dublin-Midville	Middendorf
C-2	AIK-823 40V-s4	33 26 15	81 46 17	415 (T)	168	153	163	Dry hole	Floridan-Midville	Congaree/ Fourmile
C-2	AIK-825 40V-s6	33 26 16	81 46 14	418.8	231	216	226	Crouch Branch aquifer	Floridan-Midville	Black Creek
C-2	AIK-824 40V-s5	33 26 16	81 46 15	418.6	365	350	360	Crouch Branch aquifer	Floridan-Midville	Black Creek
C-2	AIK-818 40V-s3	33 26 17	81 46 14	418.3	425	410	420	McQueen Br. aquifer	Floridan-Midville	Middendorf
C-2	AIK-817 40V-s2	33 26 17	81 46 15	418.9	535	520	530	McQueen Br. aquifer	Floridan-Midville	Middendorf
C-3	AIK-849 36U-o6	33 32 32	81 29 06	301.6	97	82	92	Steed Pond aquifer	Floridan-Midville	Lang Syne/Sawdust Landing
C-3	AIK-848 36U-o5	33 32 33	81 29 07	299.7	131	116	126	Crouch Branch aquifer	Floridan-Midville	Steel Creek
C-3	AIK-847 36U-o4	33 32 34	81 29 07	299.0	193	178	188	Crouch Branch aquifer	Floridan-Midville	Black Creek
C-3	AIK-846 36U-o3	33 32 33	81 29 08	297.8	255	240	250	Crouch Branch aquifer	Floridan-Midville	Black Creek
C-3	AIK-845 36U-o2	33 32 35	81 29 08	296.9	356	341	351	McQueen Br. aquifer	Floridan-Midville	Middendorf
C-3	AIK-826 36U-o1	33 32 30	81 29 05	294.9	500	485	495	McQueen Br. aquifer	Floridan-Midville	Middendorf
C-5	BRN-360 35X-e4	33 19 15	81 24 27	264.3	140	125	134	Upper Three Runs aquifer	Floridan-Dublin	Dry Branch
C-5	BRN-359 35X-e3	33 19 16	81 24 27	265.5	214	199	209	Gordon aquifer	Floridan-Dublin	Congaree/ Fourmile
C-5	BRN-367 35X-e7	33 19 15	81 24 28	263.8	285	270	280	Gordon aquifer	Floridan-Dublin	Congaree/ Fourmile
C-5	BRN-368 35X-e8	33 19 14	81 24 28	265.1	443	428	438	Crouch Branch aquifer	Floridan-Dublin	Steel Creek
C-5	BRN-365 35X-e5	33 19 15	81 24 28	263.5	539	524	534	Crouch Branch aquifer	Floridan-Dublin	Black Creek
C-5	BRN-366 35X-e6	33 19 14	81 24 28	266.7	715	700	710	McQueen Br. aquifer	Midville	Black Creek

Table 1. Continued

Well site	Well / grid	Latitude	Longitude	Well altitude (ft, msl)	Well depth (ft)	Top of screen (ft, lsd)	Bottom of screen (ft, lsd)	Hydrologic unit	Hydrologic system	Formation
C-5	BRN-358 35X-e02	33 19 14	81 24 28	265.6	847	832	842	McQueen Br. aquifer	Midville	Middendorf
C-6	BRN-351 34Y-x3	33 10 43	81 18 53	207.3	95	80	90	Upper Three Runs aquifer	Floridan	Dry Branch
C-6	BRN-350 34Y-x2	33 10 45	81 18 54	207.4	170	155	165	Upper Three Runs aquifer	Floridan	Clinchfield
C-6	BRN-352 34Y-x4	33 10 44	81 18 53	207.1	293	278	288	Gordon aquifer	Floridan	Congaree/ Fourmile
C-6	BRN-354 34Y-x6	33 10 44	81 18 54	207.6	411	396	406	Gordon aquifer	Floridan	Snapp
C-6	BRN-353 34Y-x5	33 10 43	81 18 54	207.7	588	573	583	Crouch Branch aquifer	Dublin	Steel Creek
C-6	BRN-355 34Y-x7	33 10 44	81 18 55	208.0	701	686	696	Crouch Branch aquifer	Dublin	Black Creek
C-6	BRN-356 34Y-x8	33 10 43	81 18 56	208.6	929	914	924	McQueen Br. aquifer	Midville	Black Creek
C-6	BRN-349 34Y-x1	33 10 42	81 18 55	208.6	1,045	1,030	1,040	McQueen Br. aquifer	Midville	Middendorf
C-7	ALL-363 37Z-t4	33 06 50	81 30 21	252 (T)	105	90	100	Upper Three Runs aquifer	Floridan	Dry Branch
C-7	ALL-364 37Z-t5	33 06 50	81 30 21	252 (T)	225	210	220	Upper Three Runs aquifer	Floridan	Clinchfield
C-7	ALL-365 37Z-t6	33 06 49	81 30 21	252 (T)	333	318	328	Gordon aquifer	Floridan	Warley Hill - Congaree/ Fourmile
C-7	ALL-366 37Z-t7	33 06 48	81 30 20	252 (T)	400	385	395	Gordon aquifer	Floridan	Congaree/ Fourmile
C-7	ALL-367 37Z-t8	33 06 48	81 30 20	252 (T)	566	551	561	Crouch Branch aquifer	Dublin	Steel Creek
C-7	ALL-368 37Z-t9	33 06 49	81 30 20	252 (T)	691	676	686	Crouch Branch aquifer	Dublin	Steel Creek
C-7	ALL-369 37Z-t10	33 06 47	81 30 21	252 (T)	800	785	795	Crouch Branch aquifer	Dublin	Black Creek
C-7	ALL-370 37Z-t11	33 06 48	81 30 20	252 (T)	975	960	970	McQueen Br. aquifer	Midville	Black Creek
C-7	ALL-358 37Z-t3	33 06 48	81 30 21	252 (T)	1,123	1,108	1,118	McQueen Br. aquifer	Midville	Middendorf
C-10	ALL-347 35AA-q2	33 01 30	81 23 03	290.0	1,423	1,408	1,418	McQueen Br. aquifer	Midville	Middendorf
C-10	ALL-348 35AA-q3	33 01 30	81 23 04	289.6	1,605	1,575	1,600	Appleton con-fining system	Appleton	Cape Fear

T, measured from a topographic map

lsd, measurement made relative to land surface datum

msl, measurement made relative to mean sea level

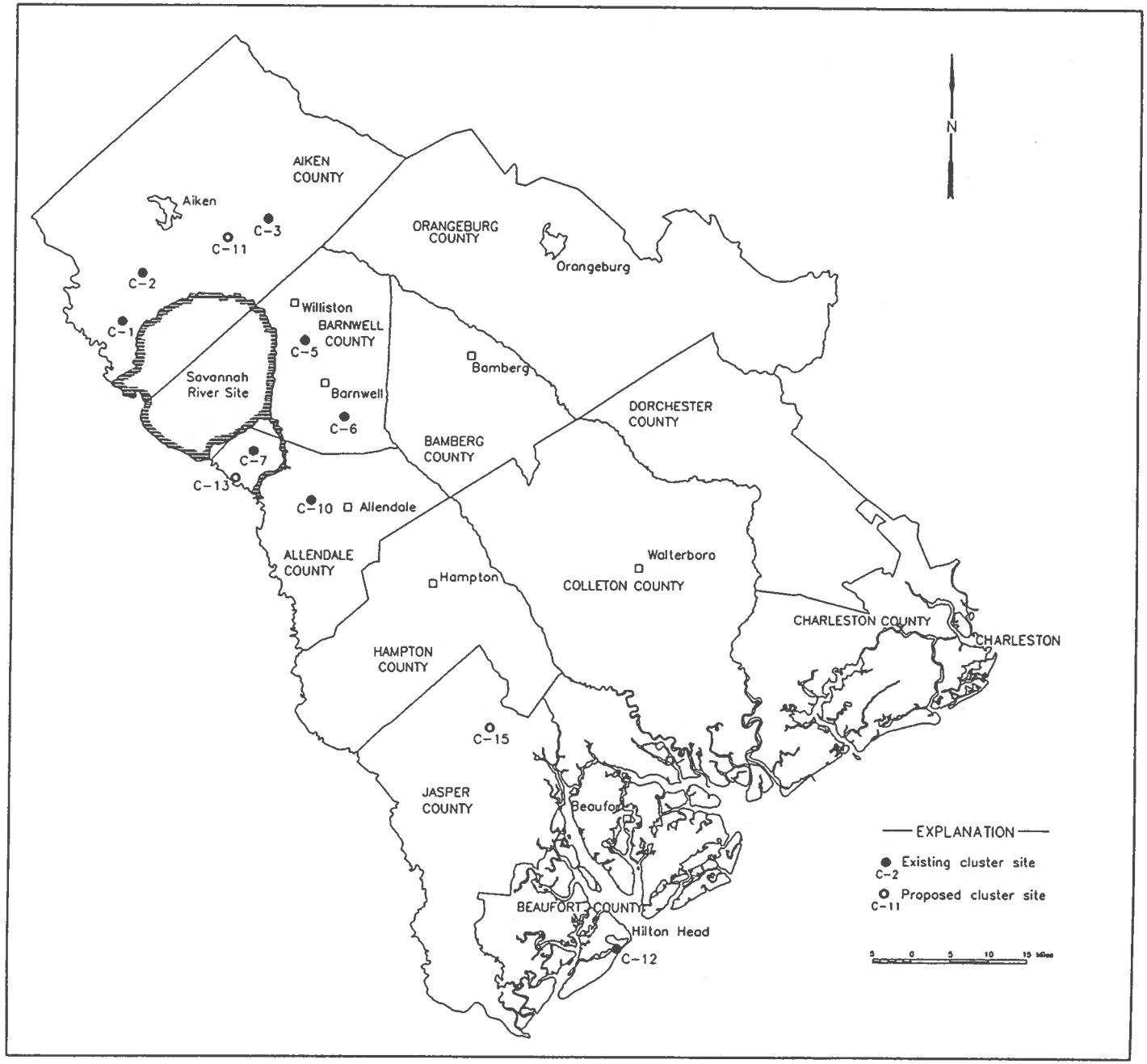

Figure 2. Location of existing well-cluster sites and newly acquired sites C-11, C13, and C-15.

Cluster Site C-10

Cluster site C-10 is located 5 mi west-northwest of the town of Allendale in Allendale County and 21 mi southeast of the center of SRS (Figs. 1 and 3). Work began at the site in July, 1988, during Phase III of the project. At that time, two deep boreholes were cored and completed as monitoring wells. Well ALL-347 was continuously cored from land surface to 1,482 ft and completed in the lower part of the Midville aquifer system (Middendorf Fm). Well ALL-348 was continuously cored from 1,086 to 1,734 ft and was completed in a clayey sand bed of the Appleton confining system (Cape Fear Fm). Drilling of these two wells was finished in January, 1989. Funding to complete the cluster was unavailable until the current phase of the project (1994).

In the second 5-year proposal, submitted to USDOE by SCDNR-WRD in January 1992, funding to complete C-10 was included. The proposal specified drilling 10 additional monitoring wells at the site, bringing the total to 12 wells. Since the time of submittal, however, much more information has become available regarding the hydrogeologic framework of the area (Aadland and others, 1995). Upon examination of this material and after consultation with hydrologists from USDOE and WSRC (Westinghouse Savannah River Company) a joint decision was made to place more emphasis on acquiring hydraulic-property estimates of the aquifers and confining units and less on the delineation of the hydrogeologic framework. This shift in thinking has resulted in a significant change in the design of the monitoring wells and in the number of wells required at each site. Up until this time, all wells in the network had been constructed with short screens (generally 10 ft) for the purpose of understanding vertical hydraulic gradients that exist within and between the aquifers. The vertical gradients provided insights into the hydraulic continuity of the system and thus enabled us to differentiate and map the hydrologic units in the area. Because we now have a greater knowledge of the vertical and lateral extents of the hydrologic units in the vicinity of C-10, we did not have to limit ourselves to short screen lengths except in those sections of the sedimentary sequence that were questionable, notably in the Tertiary section. As a consequence, the number of additional wells to be drilled was reduced from ten to seven and screen lengths in four of the wells were lengthened (Table 2; Fig. 4). The longer screen

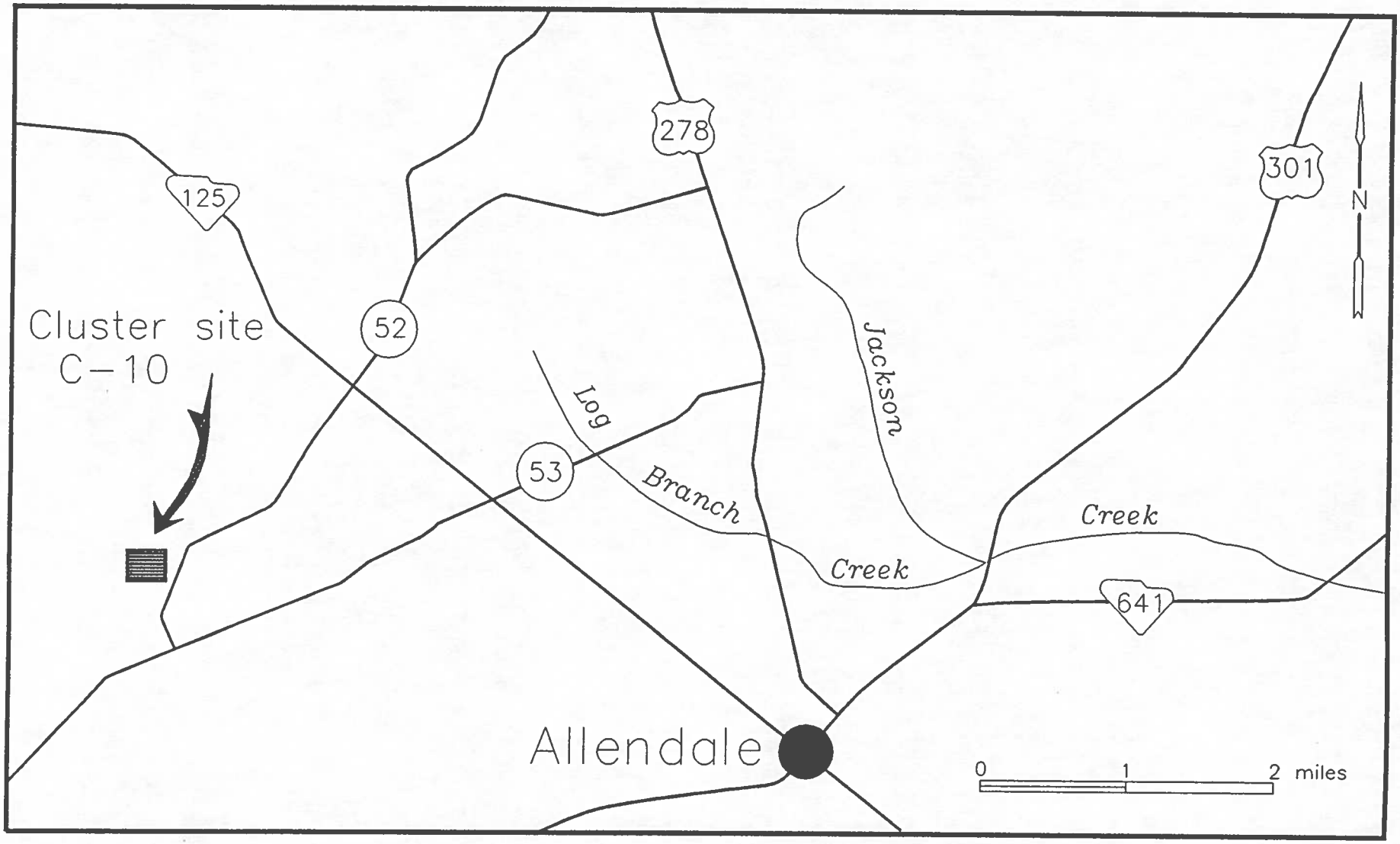

Figure 3. Location of well-cluster site C-10, Allendale County.

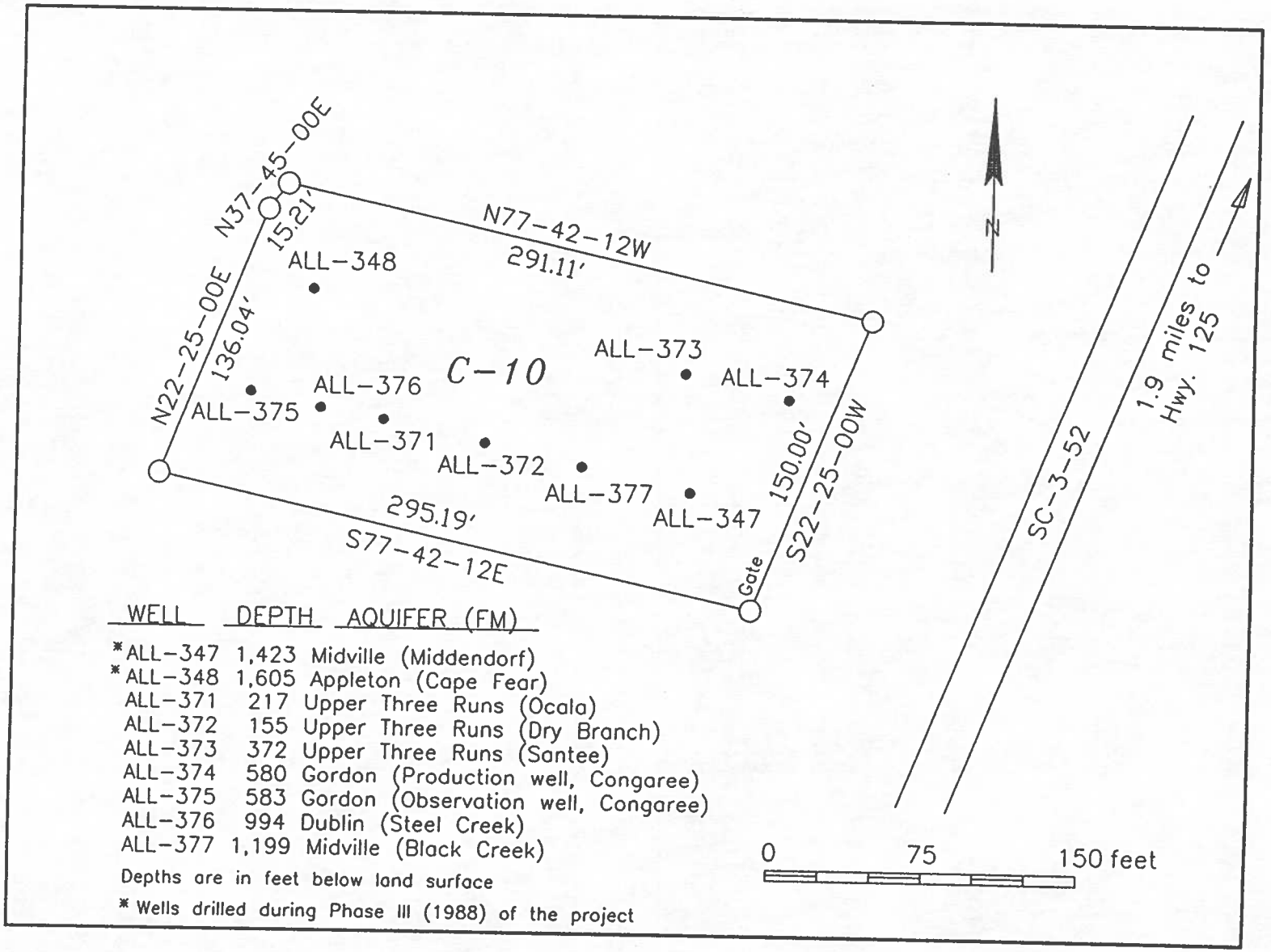

Figure 4. Well locations at C-10.

lengths allow for large-discharge pumping tests to be made without the complications of partial-penetration problems. The pumping tests will provide much-needed information on the hydraulic properties of the units, specifically the hydraulic conductivity, transmissivity, storage coefficient, and leakage coefficient.

Table 2. Proposed well-construction data for seven new wells at site C-10

WELL	TOTAL DEPTH	BOTTOM OF 6-IN CASING	TOP OF 4-IN CASING	BOTTOM OF 4-IN CASING	TOP OF SCREEN	BOTTOM OF SCREEN	SCREEN LENGTH	HYDROLOGIC UNIT
ALL-347*	1,423	1,392	1,093	1,408	1,408	1,418	10	MIDVILLE
ALL-348*	1,605	1,576	1,532	1,575	1,575	1,600	25	APPLETON
ALL-371	217	160	152	192	192	212	20	UTR
ALL-372	155	125	98	140	140	150	10	UTR
ALL-373	372	312	286	327	327	367	40	UTR
ALL-374	580	440	408	450	450	575	125	GORDON
ALL-375	583	440	411	453	453	577	125	GORDON
ALL-376	994	770	742	784	784	989	205	DUBLIN
ALL-377	1,199	1,150	1,132	1,174	1,174	1,194	20	MIDVILLE

* Drilled during Phase III (1988) of the project
UTR, Upper Three Runs aquifer
All measurements are in feet measured from land surface

Bids were received and a contract was awarded to Grosch Irrigation Company, Inc. Drilling began in July 1995 and concluded in January 1996. Results of the drilling activities will be documented in the next phase report (Phase IX: July 1, 1995 - June 30, 1996). Under the direction of Dr. David S. Snipes, Professor of Geology at Clemson University, three pumping tests will be made at fully penetrating wells. Two single-well pumping tests are scheduled, one of the Dublin aquifer system and one of the Upper Three Runs aquifer. One multiple-well pumping test is scheduled for the Gordon aquifer.

Cluster Site C-11

Cluster site C-11 will be located near the town of Oakwood at the Oakwood Fire Tower off U. S. Highway 78 in Aiken County (Figs. 2 and 5). The fire tower is no longer in use and the South Carolina Forestry Commission has granted SCDNR-WRD permission to use it as a drill site. At C-11, a borehole will be continuously cored and geophysically logged from land surface to 10 ft into crystalline basement rock (approximately 550 ft). These data will provide important stratigraphic and hydrostratigraphic information of the updip section of the Coastal Plain sequence and can be correlated with data from the P-16 cluster, which is located in the northern part of SRS. Owing to monetary constraints and to other project priorities, no permanent wells are scheduled to be constructed at this site. Upon completion of the coring and logging, the borehole will be plugged and abandoned. Specifications for coring C-11 have been completed and bids will be accepted in April, 1996.

Cluster Site C-13

Site C-13 will be located on the Savannah River flood plain at Little Hell Landing in Allendale County (Figs. 6 and 7). A 1/2-acre parcel of land is being leased by the SCDNR-WRD from the South Carolina Wildlife Department (SCWD) for the construction of the wells. The location of this site was selected in order to obtain information on hydrogeologic conditions in the flood plain. In addition, information gained from the site will be compared and correlated with data from wells drilled by the U.S. Geological Survey (USGS) at Brighams Landing and Stony Bluff Landing, which are located across the river in Georgia.

Three fully penetrating wells are scheduled to be drilled at C-13 during Phase IX of the study (Table 3), one each in the Dublin and Midville aquifer systems and one in the Gordon aquifer. Single-well pumping tests will be made of each well by Clemson University. No coring is scheduled for the site; however, geophysical logs will be made from land surface to basement (approximately 1,200 ft) and drill cuttings will be

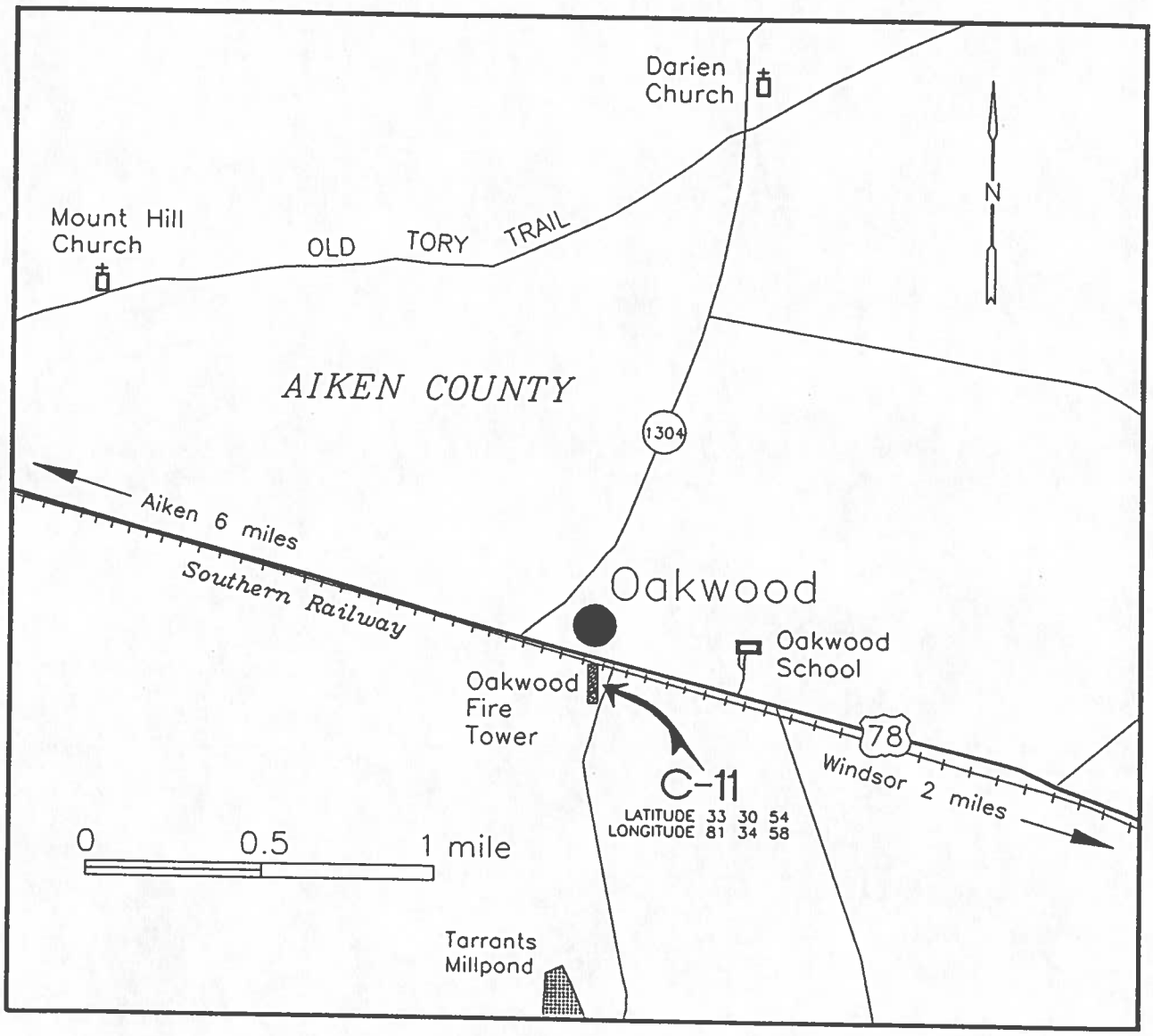

Figure 5. Location of future well-cluster site C-11, Aiken County.

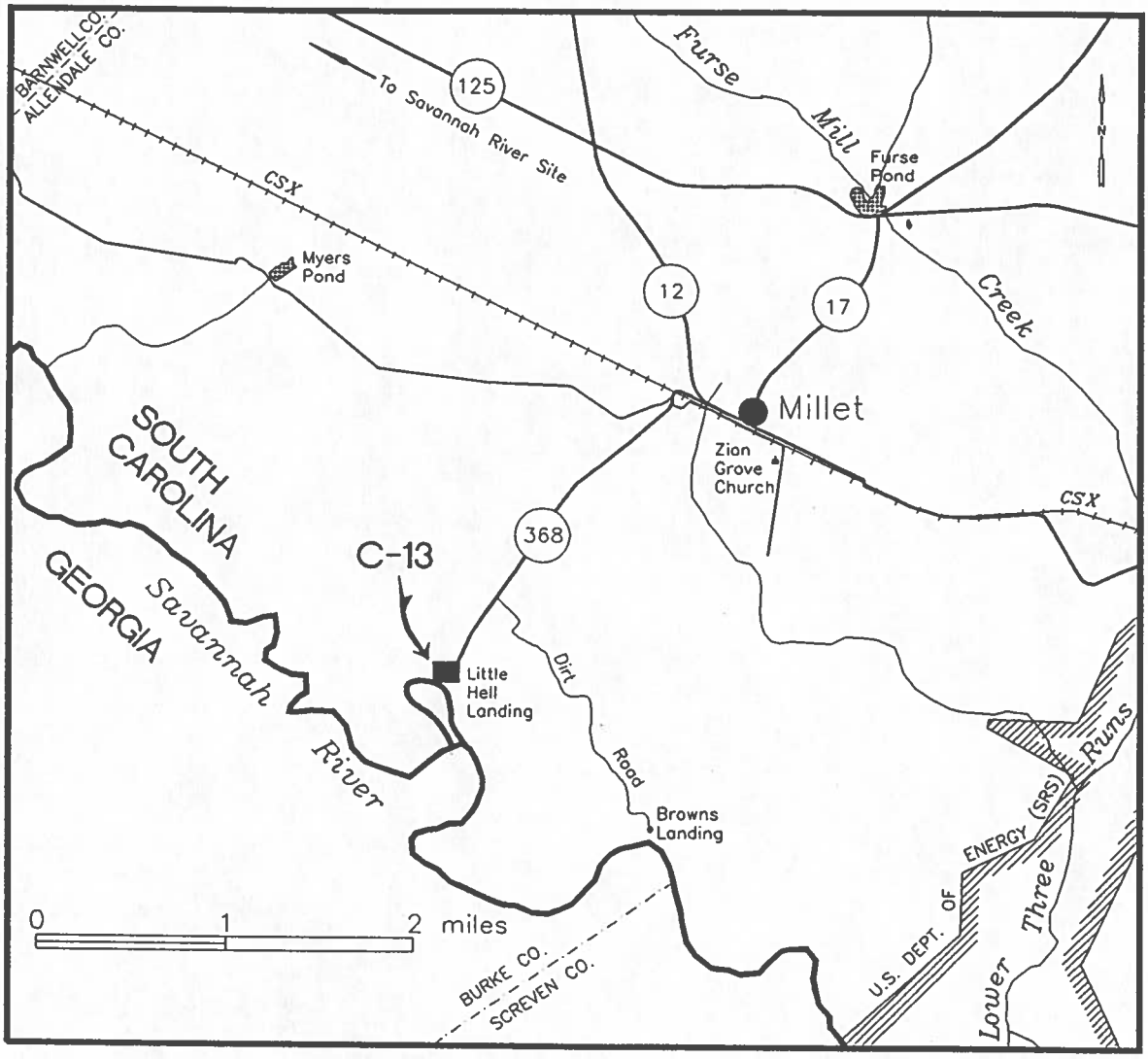

Figure 6. Location of future well-cluster site C-13, Allendale County.

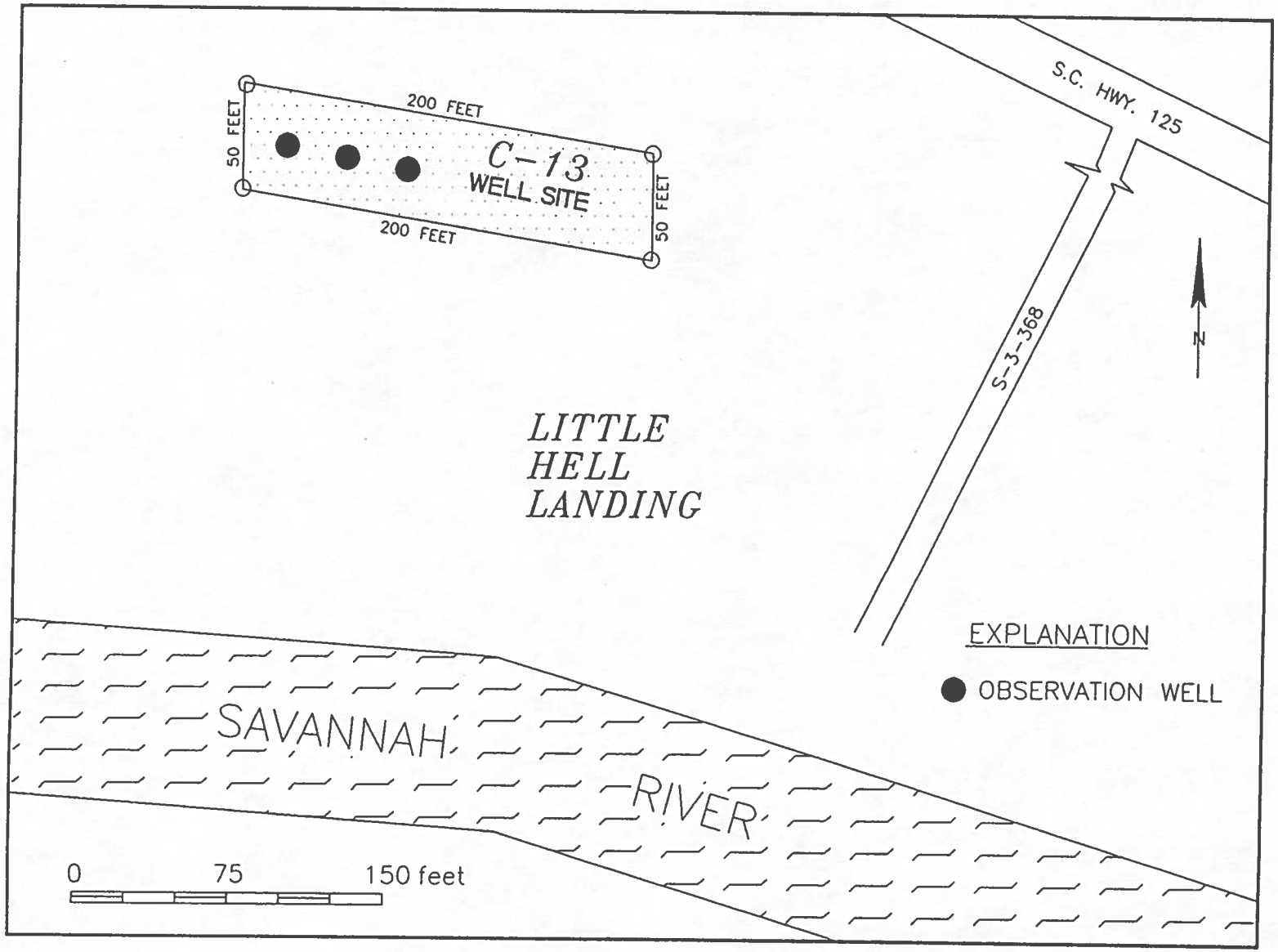

Figure 7. Site location map of C-13.

collected at 10-ft intervals. A contract was recently (November 1995) awarded to Graves Environmental, Inc. for the drilling of the three wells.

Table 3. Proposed well-construction data for three wells at site C-13

WELL	TOTAL DEPTH	BOTTOM OF 6-IN CASING	TOP OF 4-IN CASING	BOTTOM OF 4-IN CASING	TOP OF SCREEN	BOTTOM OF SCREEN	SCREEN LENGTH	HYDROLOGIC UNIT
1	1,010	780	753	795	795	1,005	210	MIDVILLE
2	625	365	338	380	380	620	240	DUBLIN
3	260	160	133	175	175	255	80	GORDON

All measurements are in feet measured from land surface

Cluster Site C-15

Site C-15 will be located north of Gillisonville in Jasper County, bordering U.S. Highway 278 and secondary road 53 (Figs. 8 and 9). This site was selected because of its strategic location midway between sites C-10 in Allendale County and C-12 in Beaufort County (Fig. 2). Information from the site will allow us to understand the hydrostratigraphy and head relationships of Jasper County and correlate hydrologic units from SRS to the coast.

Seven wells are scheduled to be drilled at this site. Owing to the expense of continuously coring such a deep hole (approximate depth to basement is 2,800 ft), sidewall cores will be collected in leiu of continuous core every 10 ft, or where necessary, such as at formation boundary contacts. In addition, a full suite of high-resolution geophysical logs will be obtained from land surface to basement.

During the current phase of the project, a 0.9-acre parcel of land was acquired from Westvaco, Inc., in Gillisonville. Specifications for drilling an Upper Floridan well and the deep test well have been completed. Contracts for drilling and geophysical logging will be awarded in February 1996 (Phase IX). The remainingfive wells will be drilled during Phase X of the study (1997).

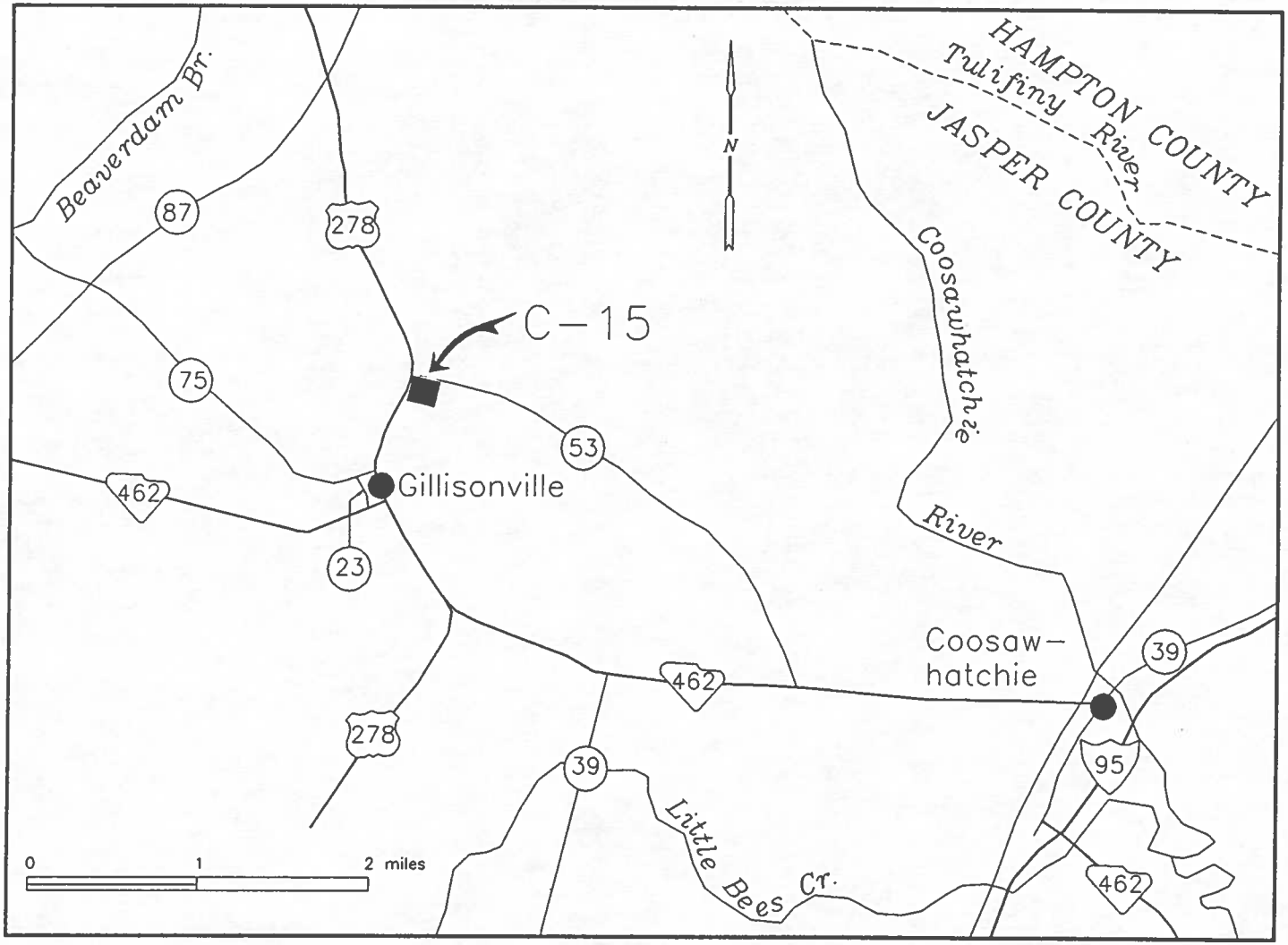

Figure 8. Location of future well-cluster site C-15, Jasper County.

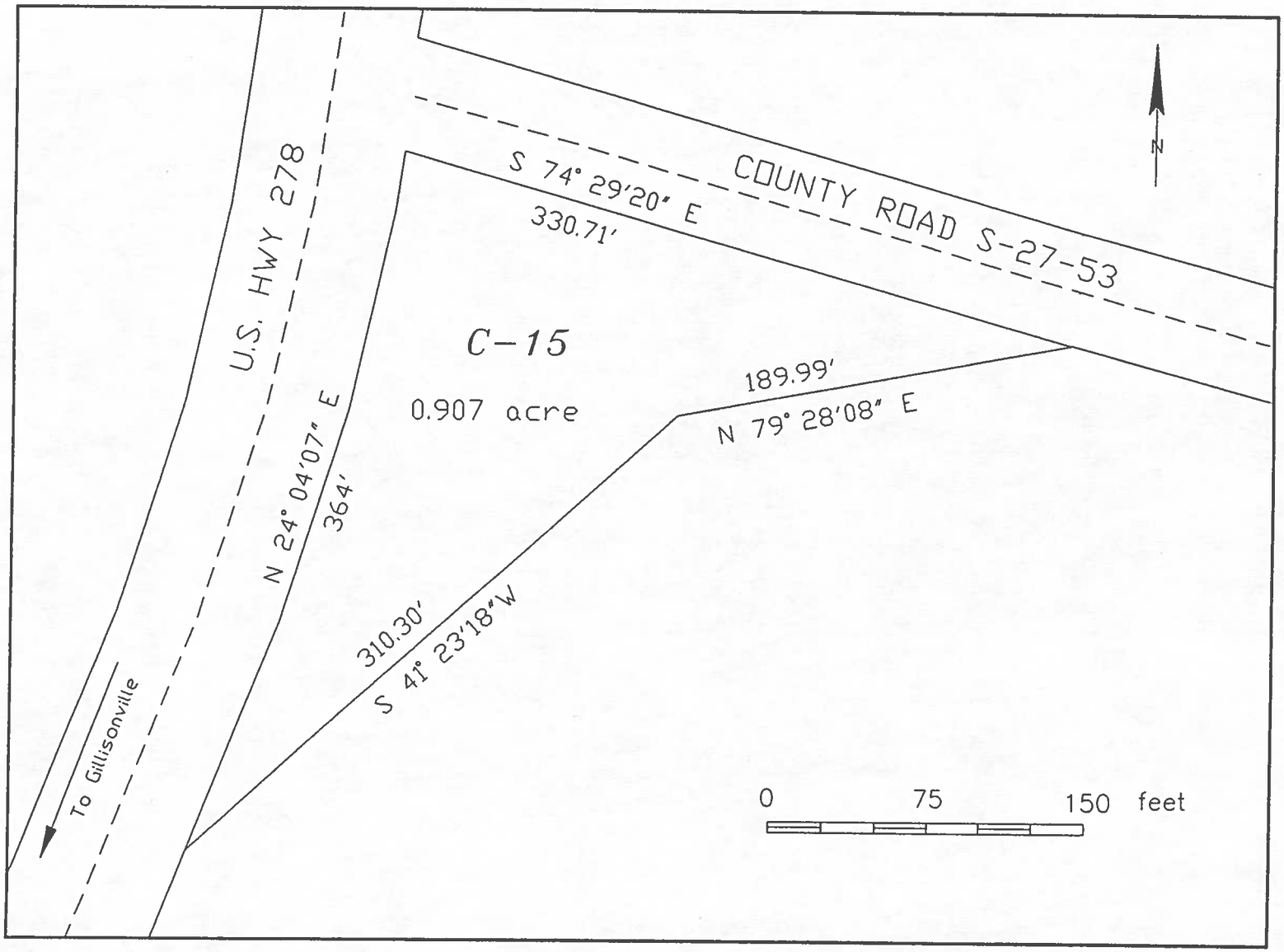

Figure 9. Site location map of C-15.

Cluster Site C-7

Existing site C-7 is located 4 mi northwest of the town of Martin in Allendale County and 12 mi east-southeast of the center of SRS (Fig. 10). During Phase VI of the project, Graves Well Drilling Company, Inc. cored a 1,417-ft test hole at the site and completed a deep well at the base of the Midville aquifer system (Gellici and others, 1995). During Phase VII, Grosch Irrigation Company, Inc., began work on the installation of eight additional monitoring wells at the site. Six of the eight wells were completed during Phase VII (Gellici and others, 1995); the final two wells (ALL-369 and ALL-370) were drilled in July and August of the current phase of the project (Fig. 11). Well ALL-369 was screened in the lower part of the Dublin aquifer system and ALL-370 in the upper part of the Midville aquifer system (Figs. 12 and 13). A 25.3-ft head difference exists between the two wells with the higher head occurring in the Midville system (Fig. 14). The head difference is the result of thick, laterally continuous clay beds of the the Allendale confining system that hydraulically isolate the two aquifer systems in the downdip section of the Coastal Plain sequence (Fig. 14).

Specific-Capacity Tests at Sites C-1 and C-7

Site C-1 is located 1/2 mi northwest of the town of Jackson in Aiken County and 11 mi west-northwest of the center of SRS (Fig. 15). Four monitoring wells were constructed at the site during Phases VI and VII of the project (Fig. 16; Gellici and others, 1995). During the current phase, low-discharge, short-term pumping tests were made at each well at sites C-1 and C-7 to determine specific capacities (Table 4). Specific-capacity values for nine wells at site C-7 ranged from 0.3 to 20.6 gpm/ft. Values for four wells at site C-1 ranged from 0.5 to 8.6 gpm/ft. These tests enabled us to determine horsepower requirements of submersible pumps. Pumps and automatic water-level recorders were purchased for all wells and have been installed.

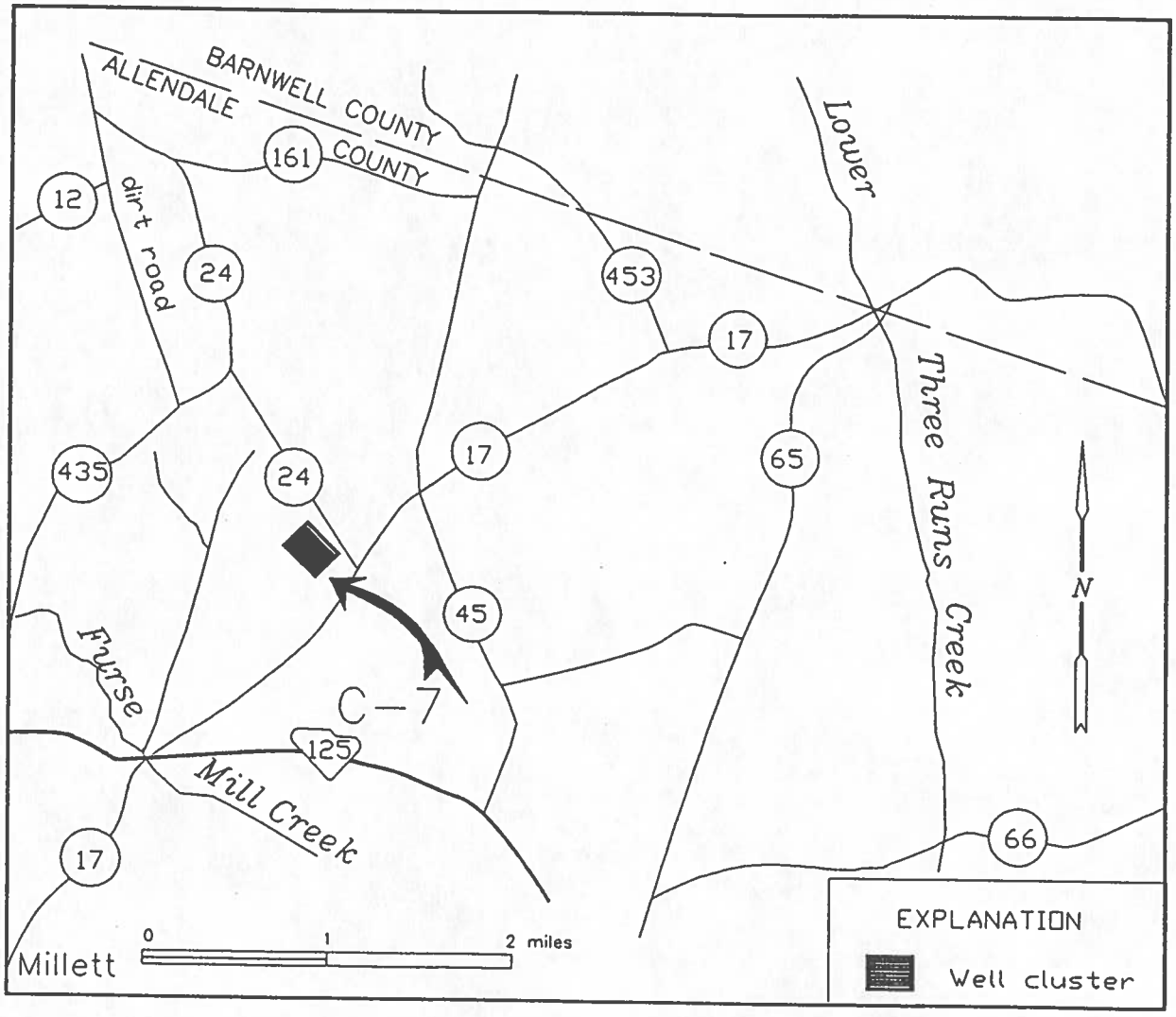

Figure 10. Location of well-cluster site C-7, Allendale County.

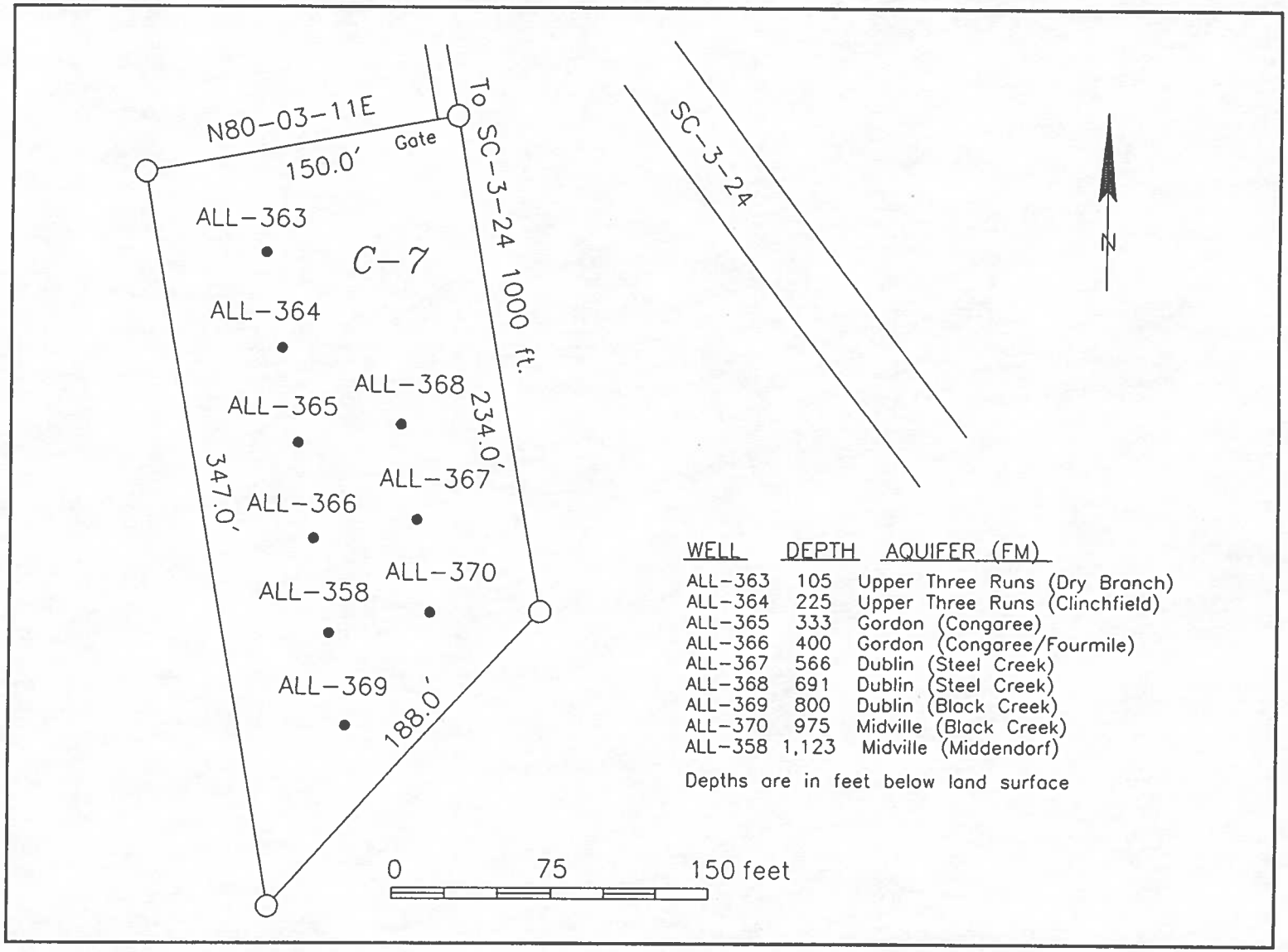

Figure 11. Well locations at C-7.

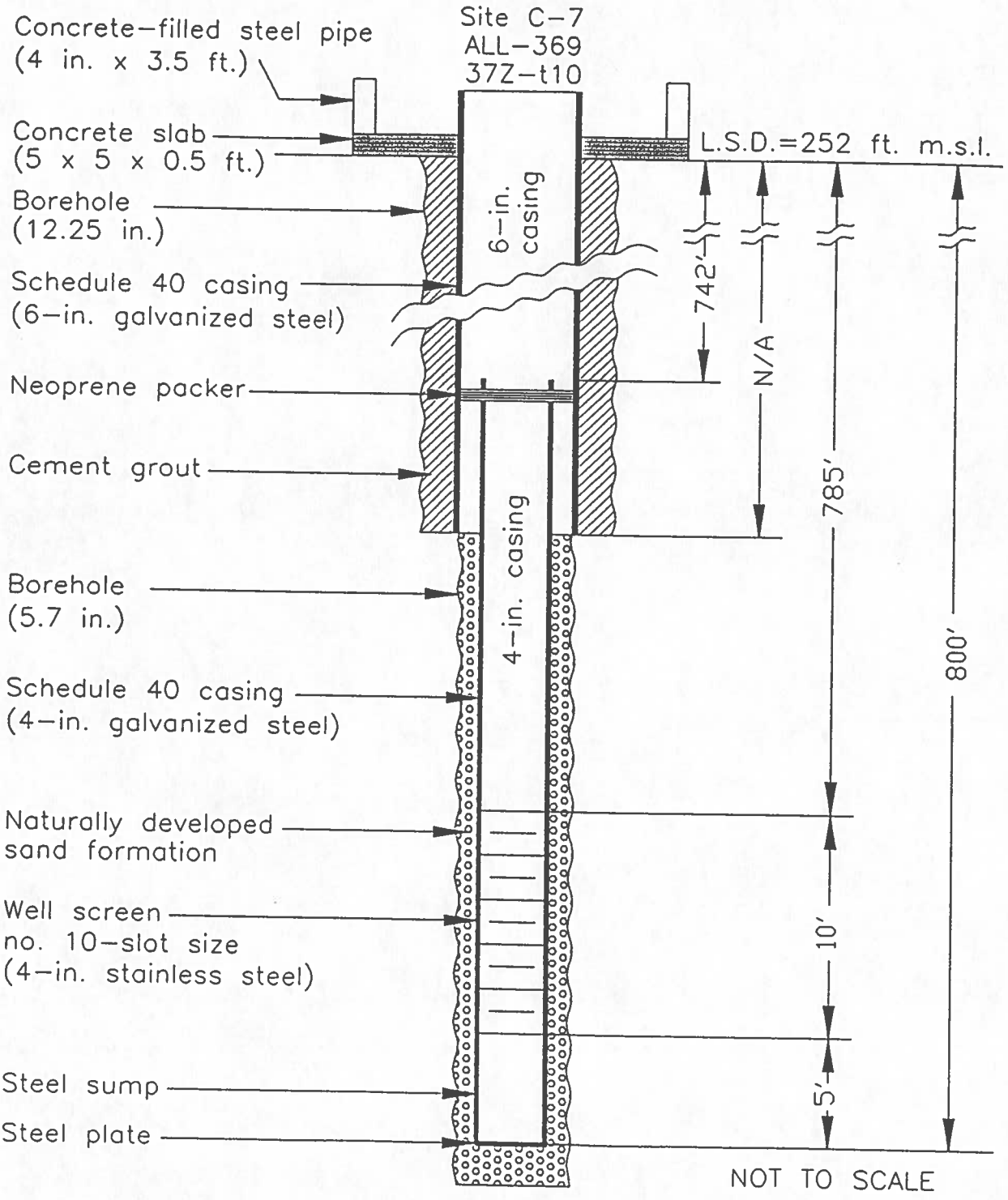

Figure 12. Well construction diagram of well ALL-369, site C-7.

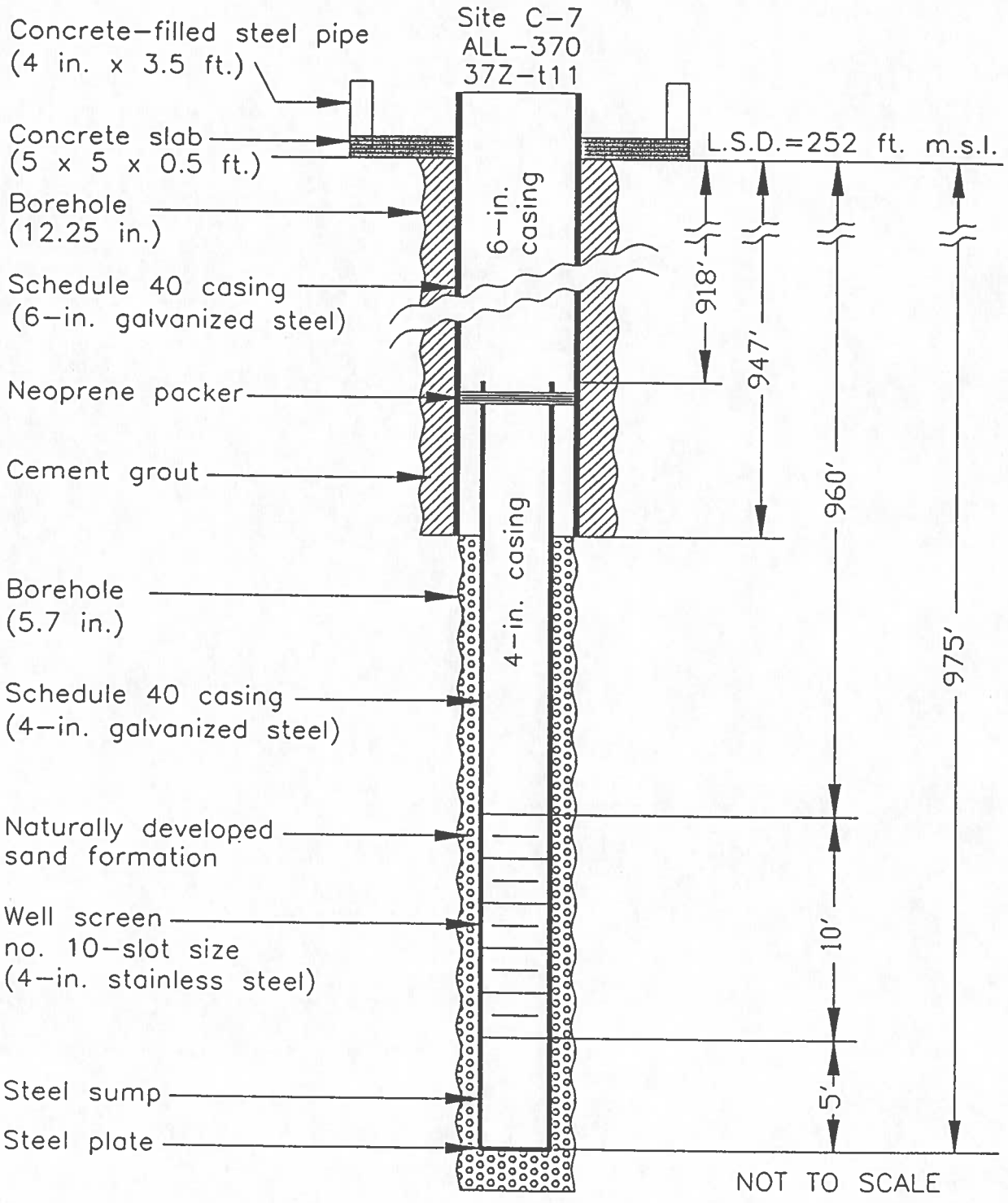

Figure 13. Well construction diagram of well ALL-370, site C-7.

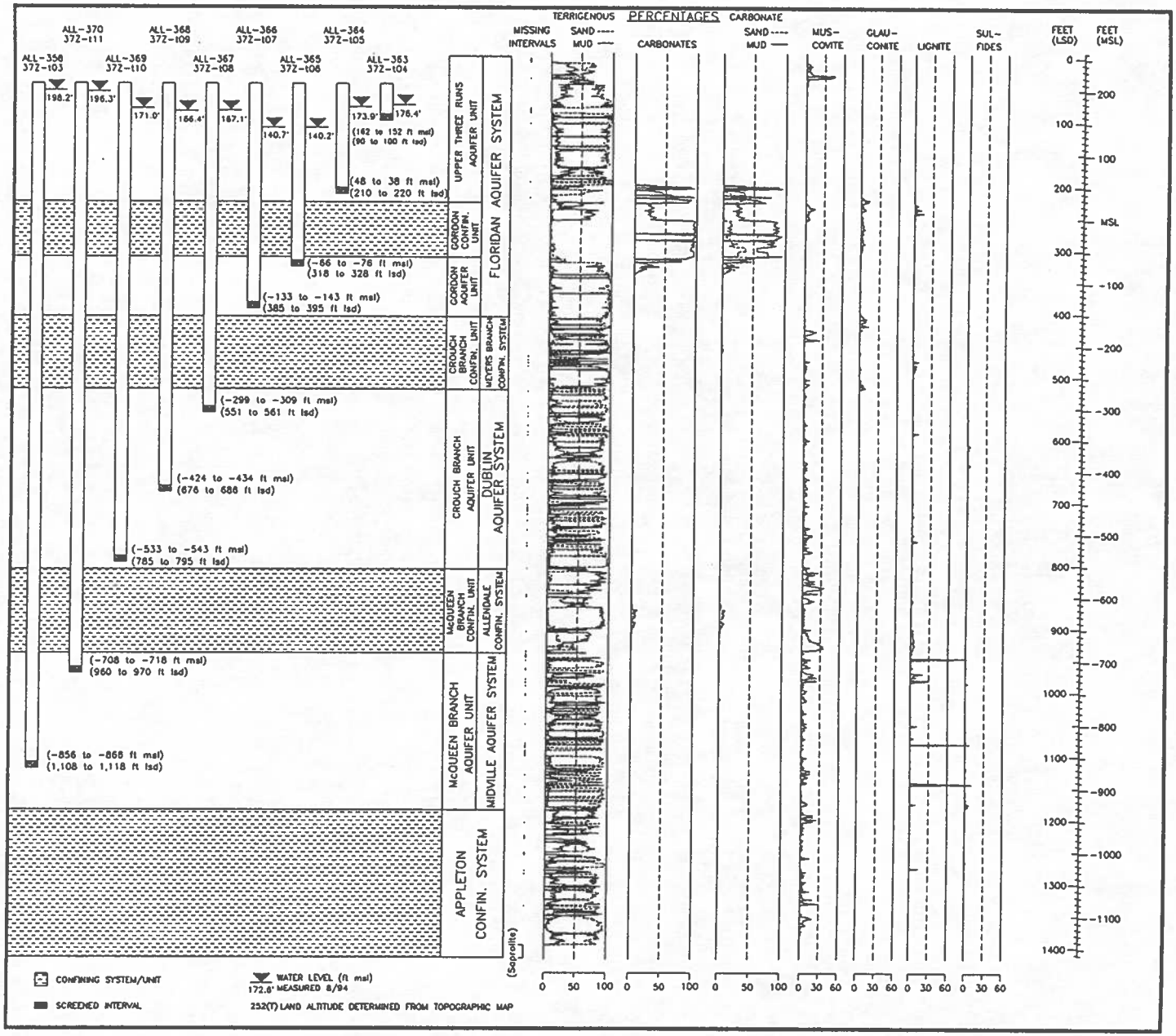

Figure 14. Head relationships among wells at site C-7.

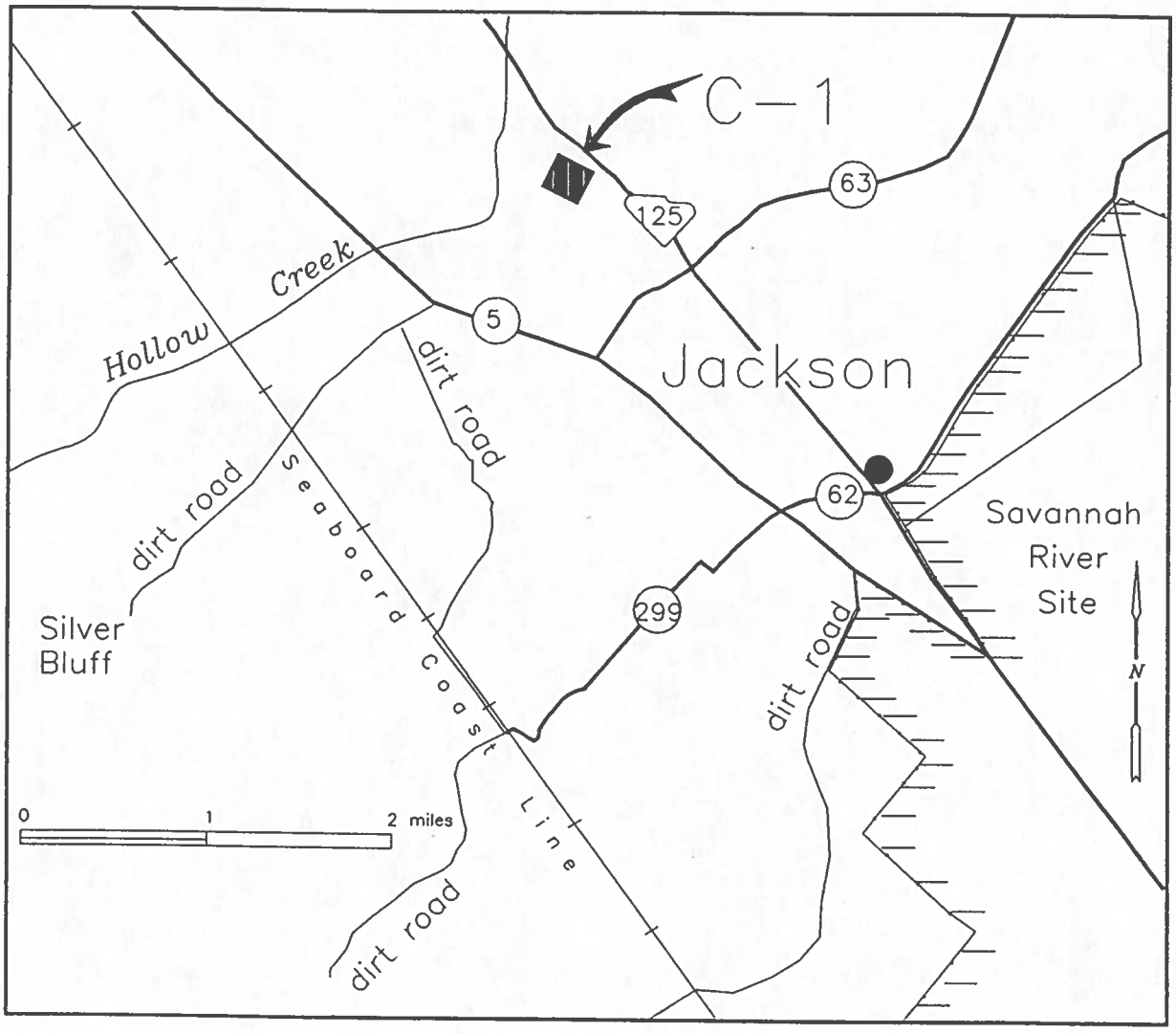

Figure 15. Location of well-cluster site C-1, Aiken County.

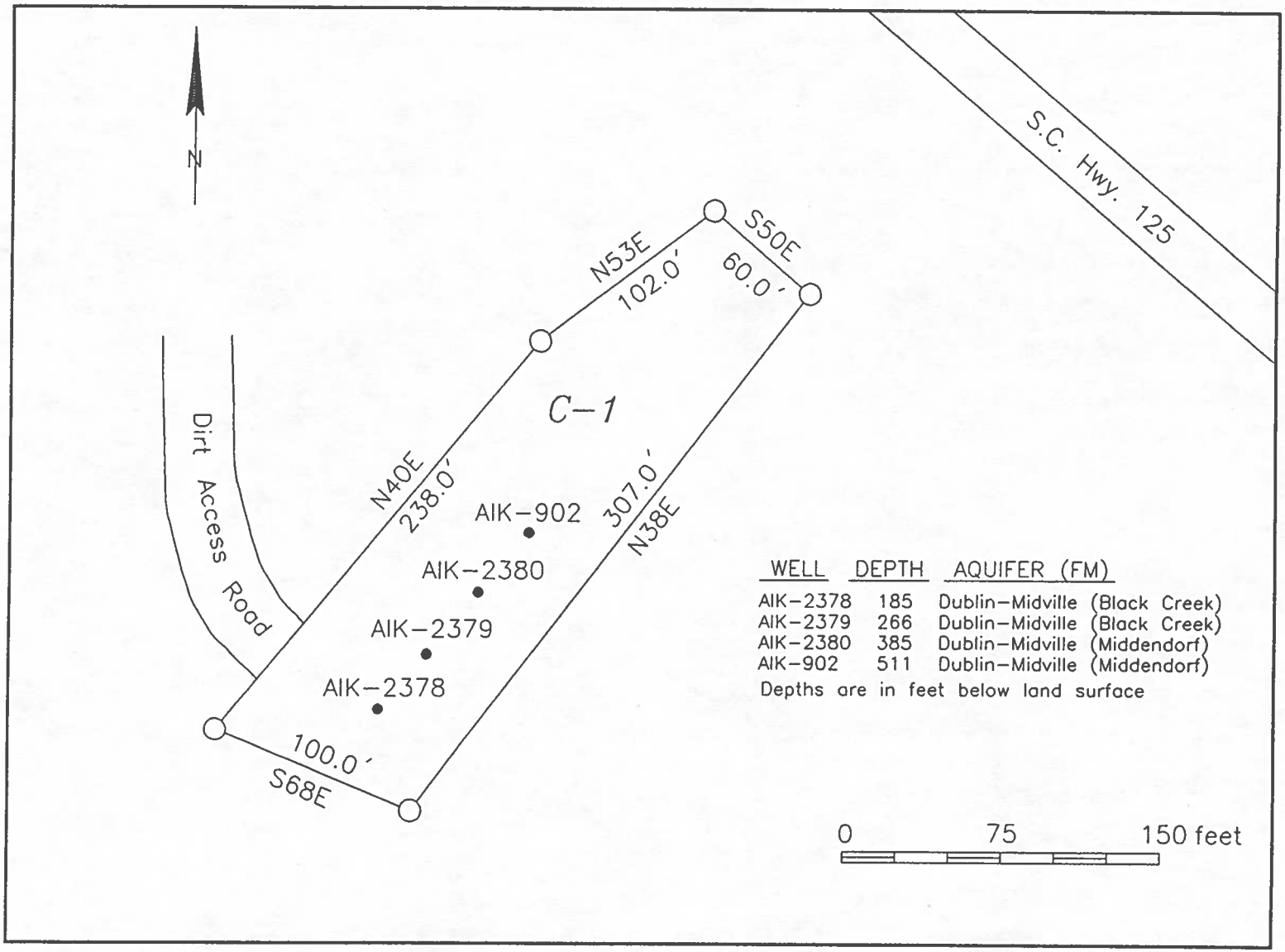

Figure 16. Well locations at C-1.

Table 4. Results of specific-capacity tests and pump models for wells at C-1 and C-7

SITE	WELL	STATIC WATER LEVEL*	PUMPING LEVEL (FT)*	DRAW-DOWN (FT)	TIME OF TEST (MIN)	DIS-CHARGE (GPM)	SPECIFIC CAPACITY (GPM/FT)	GRUNDFOS PUMP MODEL	HORSE POWER OF PUMP
C-1	AIK-902	65.42	68.10	2.68	5	23	8.6	25S05-3	1/2
C-1	AIK-2378	55.10	96.00	40.90	5	21	0.5	16S07-8	3/4
C-1	AIK-2379	58.90	99.70	40.80	5	21	0.5	16S07-8	3/4
C-1	AIK-2380	62.40	99.00	36.60	5	21	0.6	16S07-8	3/4
C-7	ALL-358	55.85	57.55	1.70	10	20	11.8	25S07-5	3/4
C-7	ALL-363	76.50	93.58	17.08	40	19	1.1	JS16-07	3/4
C-7	ALL-364	81.07	87.00	5.93	15	14	2.4	25S07-5	3/4
C-7	ALL-365	113.89	126.80	12.91	9	20	1.5	25S10-7	1
C-7	ALL-366	111.97	139.25	27.28	29	19	0.7	25S10-7	1
C-7	ALL-367	86.33	87.35	1.02	13	21	20.6	25S07-5	3/4
C-7	ALL-368	86.93	140.10	53.17	6	18	0.3	16S10-10	1
C-7	ALL-369	82.48	104.20	21.72	24	21	1.0	25S07-5	3/4
C-7	ALL-370	58.49	62.92	4.43	10	23	5.2	25S07-5	3/4

* Measured from top of well casing (ft)

Report Writing

Two comprehensive hydrologic reports were completed during this phase of the project. Gellici and others (1995) compiled data collected from the project since 1986. Data collected include 146 paleontologic and palynologic age dates, 100 x-ray diffraction analyses, 442 sieve analyses, 6,040 feet of detailed core description, mineral composition and porosity determined from thin-section analyses, and continuous water level data. The report also describes 14 lithostratigraphic units and 8 hydrostratigraphic units that occur in the study area.

Aadland and others (1995) presented a detailed description of the hydrogeologic framework of west-central South Carolina. A set of comparative chronostratigraphic, lithostratigraphic, and hydrostratigraphic charts and a series of lithostratigraphic and hydrostratigraphic sections, isopachous, and unit-surface maps, potentiometric-surface maps, and well-cluster profiles illustrate the hydrogeologic setting of the study area.

REFERENCES

Aadland, R. K., Gellici, J. A., and Thayer, P. A., *Hydrogeologic framework of west-central South Carolina:* South Carolina Department of Natural Resources, Water Resources Division Report 5, 200 p., 47 sheets.

Gellici, J. A., 1991, *Hydrogeologic investigation and establishment of a permanent multi-observational well network in Aiken, Allendale, and Barnwell counties, South Carolina—Phase IV*: South Carolina Water Resources Commission Open-File Report 39, 35 p.

Gellici, J. A., Reed, R. H., Logan, W. R., Aadland, R. K., and Simones, G. C., 1995, *Hydrogeologic investigation and establishment of a permanent multi-observational well network in Aiken, Allendale, and Barnwell counties, South Carolina—eight year interim report (1986-1994)*: South Carolina Department of Natural Resources, Water Resources Division Open-File Report 1, 417 p., 9 sheets.

Kuntz, G. B., and Griffin, W. T., 1988, *Hydrogeologic investigation and establishment of a multi-observational well network in Aiken, Allendale, and Barnwell Counties, South Carolina—Phase II:* South Carolina Water Resources Commission Open-File Report 28, 92 p.

Kuntz, G. B., Griffin, W. T.,. Greaney, Teresa, and Gellici, J. A., 1989, *Hydrogeologic investigation and establishment of a permanent multi-observational well network in Aiken, Allendale, and Barnwell Counties, South Carolina—Phase III:* South Carolina Water Resources Commission Open-File Report 32, 54 p.

Logan, W., R., 1987, *Geohydrologic investigation and establishment of a permanent multi-observational well network in Aiken, Allendale, and Barnwell Counties, South Carolina—Phase I:* South Carolina Water Resources Commission, Open-File Report 23, 70 p.

Simones, G. C., 1992, *Hydrogeologic investigation and establishment of a permanent multi-observational well network in Aiken, Allendale, and Barnwell Counties, South Carolina—Phase V:* South Carolina Water Resources Commission Open-File Report 41, 60 p.