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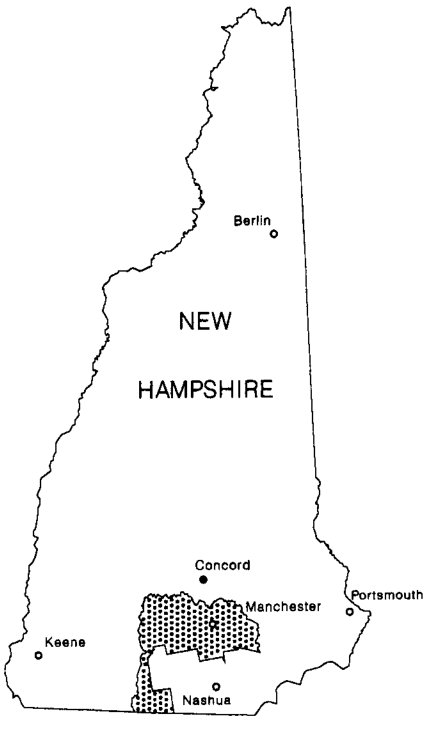
Geohydrology and Water Quality of Stratified-Drift Aquifers in the Middle Merrimack River Basin, South-Central New Hampshire

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 92-4192



Prepared in cooperation with the

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES,
WATER RESOURCES DIVISION

GEOHYDROLOGY AND WATER QUALITY OF STRATIFIED-DRIFT AQUIFERS IN THE MIDDLE MERRIMACK RIVER BASIN, SOUTH-CENTRAL NEW HAMPSHIRE

By Joseph D. Ayotte and Kenneth W. Toppin

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Bow, New Hampshire
1995

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CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATED WATER-QUALITY UNITS

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
	Area	
square mile (mi^2)	2.59	square kilometer
	Volume	
cubic foot (ft^3)	0.02832	cubic meter
gallon (gal)	3.785	liter
million gallons (Mgal)	3,785	cubic meter
	Flow	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second
cubic foot per second per square mile $(ft^3/s)/mi^2$	0.01093	cubic meter per second per square kilometer
gallon per minute (gal/min)	0.06309	liter per second
million gallons per day (Mgal/d)	0.04381	cubic meter per second
	Hydraulic Conductivity	
foot per day (ft/d)	0.3048	meter per day

CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATED WATER-QUALITY UNITS (continued)

	Transmissivity	
cubic foot per day per square foot times foot of aquifer thickness $[(ft^3/d)/ft^2]ft$ or ft^2/d	0.0929	cubic meter per day per square meter times meter of aquifer thickness

Sea Level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 --a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Abbreviated water-quality units used in this report: Chemical concentrations in water are expressed in milligrams per liter (mg/L) or micrograms per liter (μg/L). Milligrams per liter is a unit expressing the concentration of chemical constituents in solution as weight (milligrams) of solute per unit volume (liter) of water; 1,000 μg/L is equivalent to 1 mg/L. Water temperature in degrees Celsius (°C) can be converted to degrees Fahrenheit (°F) by use of the following equation:

$$^\circ F = 1.8(^\circ C) + 32$$

Geohydrology and Water Quality of Stratified-Drift Aquifers in the Middle Merrimack River Basin, South-Central New Hampshire

By Joseph D. Ayotte and Kenneth W. Toppin

ABSTRACT

The U.S. Geological Survey, in cooperation with the State of New Hampshire, Department of Environmental Services, Water Resources Division has assessed the geohydrology and water quality of stratified-drift aquifers in the middle Merrimack River basin in south-central New Hampshire. The middle Merrimack River basin drains 469 square miles; 98 square miles is underlain by stratified-drift aquifers. Saturated thickness of stratified drift within the study area is generally less than 40 feet but locally greater than 100 feet. Transmissivity of stratified-drift aquifers is generally less than 2,000 feet squared per day but locally exceeds 6,000 feet squared per day. At present (1990), ground-water withdrawals from stratified drift for public supply are about 0.4 million gallons per day within the basin. Many of the stratified-drift aquifers within the study area are not developed to their fullest potential.

The geohydrology of stratified-drift aquifers was investigated by focusing on basic aquifer properties, including aquifer boundaries; recharge, discharge, and direction of ground-water flow; saturated thickness and storage; and transmissivity. Surficial geologic mapping assisted in the determination of aquifer boundaries. Data from 757 wells and test borings were used to produce maps of water-table altitude, saturated thickness, and transmissivity of stratified drift. More than 10 miles of seismic-refraction profiling and 14 miles of seismic-reflection profiling were also used to construct the water table and saturated-thickness maps.

Stratified-drift aquifers in the southern, western, and central parts of the study area are typically small and discontinuous, whereas aquifers in the eastern part along the Merrimack River valley are continuous. The Merrimack River valley aquifers formed in glacial Lakes Merrimack and Hooksett. Many other smaller discontinuous aquifers formed in small temporary ponds during deglaciation.

A stratified-drift aquifer in Goffstown was analyzed for aquifer yield by use of a two-dimensional, finite-difference ground-water-flow model. Yield of the Goffstown aquifer was estimated to be 2.5 million gallons per day. Sensitivity analysis showed that the estimate of aquifer yield was most sensitive to changes in hydraulic conductivity. The amount of water induced into the aquifer from the Piscataquog River was most affected by changes in estimates of streambed conductance.

Results of analysis of water samples from 10 test wells indicate that, with some exceptions, water in the stratified-drift aquifers generally meets U.S. Environmental Protection Agency primary and secondary drinking-water regulations. Water from two wells had elevated sodium concentrations, water from two wells had elevated concentrations of dissolved iron, and water from seven wells had elevated concentrations of manganese. Known areas of contamination were avoided during water-quality sampling.

INTRODUCTION

The population of the 19 southern New Hampshire towns in the middle Merrimack River basin increased by 22 percent between 1980 and 1990 (New Hampshire Office of State Planning, 1985). Economic development has been rapid in south-central New Hampshire, partly because of the area's proximity to metropolitan Boston. This growth has steadily increased demands for water and has stressed the capacity of existing municipal water systems, some of which depend on ground water for part or all of their water supplies. The total withdrawal from stratified-drift aquifers for municipal supply in 1990 was about 0.4 Mgal/d and represents total withdrawal divided by 365 days per year to get average daily use as if the total withdrawal were spread out over a full year (New Hampshire Department of Environmental Services, Water Management Bureau, written commun., 1991). Two of the municipal water systems use ground water seasonally to supplement surface-water supplies. In addition, U.S. Environmental Protection Agency (USEPA) primary and secondary drinking-water regulations on the treatment requirements of surface-water supplies have prompted municipalities to look carefully at their ground-water resources.

Stratified-drift aquifers discontinuously underlie 98 mi^2 of the middle Merrimack River basin, which has a total drainage area of 469 mi^2. Many of the aquifers may be capable of supplying enough water to meet domestic, community, and municipal water needs.

The U.S. Geological Survey (USGS), in cooperation with the New Hampshire Department of Environmental Services, Water Resources Division (NHDES-WRD), has done a series of ground-water studies in New Hampshire to provide detailed geohydrologic information necessary for planning for optimal use of existing water supplies and for the development of new water supplies. The study described in this report encompasses the middle Merrimack River basin and its subbasins, which include the Piscataquog River basin and part of the Souhegan River basin (fig. 1). Major watershed divides were selected as study areas because they are the natural subdivision of the hydrologic system; only a few stratified-drift aquifers, in south-central New Hampshire, extend across major surface-water divides.

Purpose and Scope

The purpose of this report is to (1) describe the geohydrologic characteristics of the stratified-drift aquifers in the middle Merrimack River basin, including the areal extent of the aquifers, water-table altitudes, general directions of ground-water flow, saturated thickness, and transmissivity; (2) present a technique for evaluating the yield of an aquifer; and (3) describe the quality of ground water in the stratified-drift aquifers.

The study was limited to the collection, compilation, and the evaluation of data from the stratified-drift aquifers in the study area. The yield of a stratified-drift aquifer in Goffstown, currently used to augment a public surface-water supply, was evaluated using a numerical model. The modeling technique could be used to evaluate similar aquifers in New Hampshire.

Previous Investigations

Products of previous investigations include a reconnaissance map at a scale of 1:125,000 that shows the availability of ground water in the middle Merrimack River basin (Cotton, 1977). Surficial geology maps for parts of the study area are being produced at a scale of 1:24,000 as part of the Cooperative Geologic Mapping (COGEOMAP) program, a cooperative program between various states and the USGS. In New Hampshire, the Department of Environmental Services, Office of the State Geologist, is the cooperator for this program. Published 7.5-minute quadrangle maps within this study area include Candia (Gephart, 1985a), Derry (Gephart, 1985b), and Townsend, Mass. (Koteff and Stone, 1990). Four unpublished geologic quadrangles include Manchester North and Manchester South (Carl Koteff, U.S. Geological Survey, written commun., 1990), Greenfield, and Greenville (Carol Hildreth, Office of the New Hampshire State Geologist, written commun., 1990) and the New Hampshire parts of the Ashby, Mass.-N.H. and Ashburnham, Mass.-N.H. (Carol Hildreth, Office of the New Hampshire State Geologist, written commun., 1990). Koteff (1970) published the surficial geology of the Milford quadrangle at a scale of 1:62,500. Koteff and others (1984) discuss the surficial geology of the Merrimack Valley and the processes that led to the deposition of lacustrine and deltaic deposits. Numerous other studies were done by private consultants for local concerns.

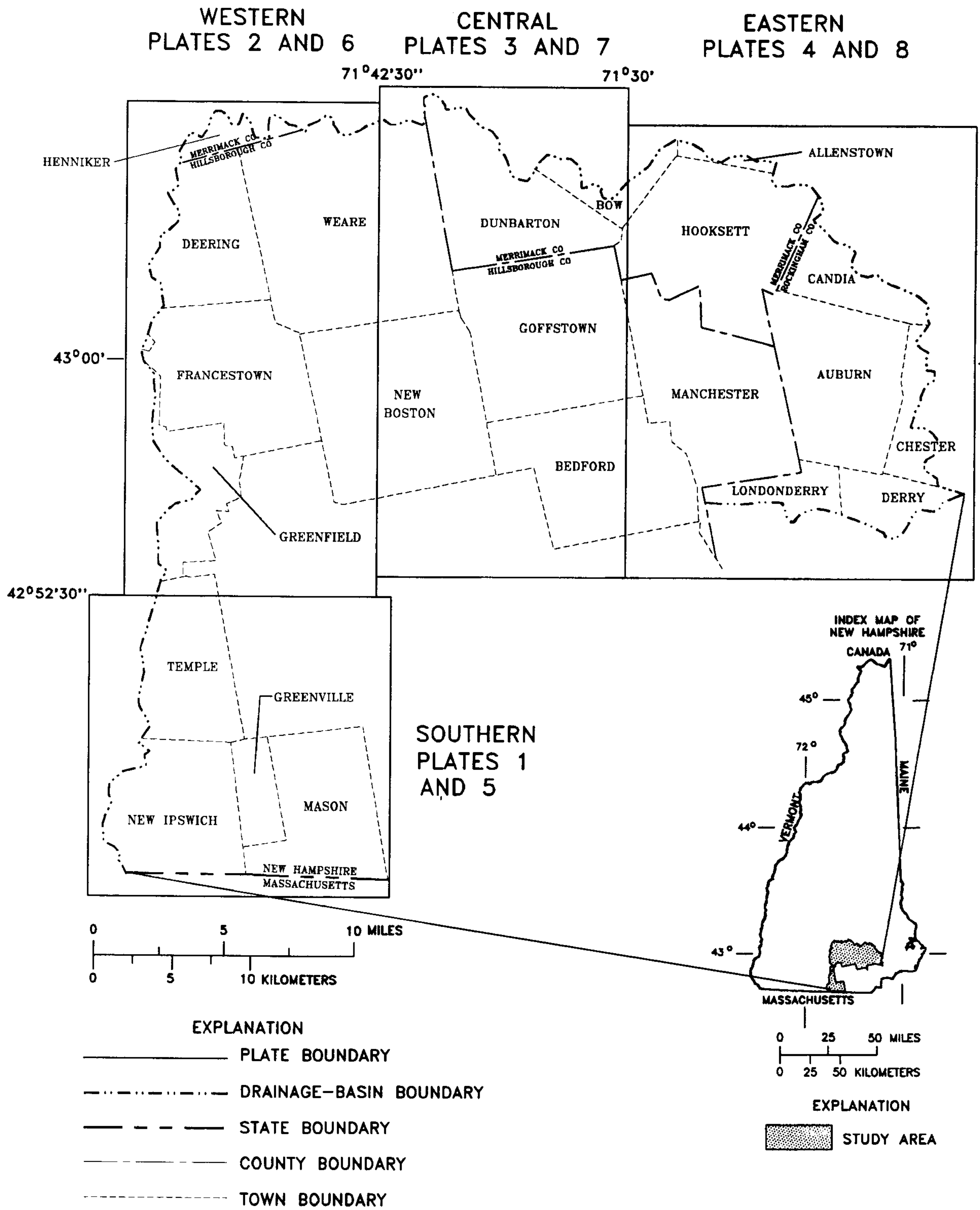


Figure 1.--The middle Merrimack River basin study area and locations of southern, western, central, and eastern plates in south-central New Hampshire.

Methods of Study

The following methods were used in this study:

1. Areal extent of the stratified-drift aquifers was mapped with the aid of soils maps from the U.S. Soil Conservation Service, surficial geologic maps, and data from the COGEOMAP program. Where no data were available, areal extent of stratified-drift aquifers was mapped by USGS personnel.
2. Published and unpublished subsurface data on ground-water levels, saturated thickness, and stratigraphy of the aquifers from the USGS, NHDES-WRD, and the New Hampshire Department of Transportation were compiled. Additional data were obtained from municipalities, local residents, well-drilling contractors, and geohydrologic consulting firms. The locations of wells, borings, and seismic lines were plotted on base maps, and pertinent well and boring data were added to the Ground Water Site Inventory (GWSI) data base maintained by the USGS. Each data point is cross-referenced to a site-identification number and to any other pertinent information about the site.
3. Seismic-refraction profiling, a surface geophysical technique, was used to determine depths to the water table and depths to the bedrock surface. (Locations of these profiles are shown on plates 1-4.) The seismic data were interpreted by using a time-delay, ray-tracing computer program developed by Scott and others (1972). Data from nearby wells and test holes were used to verify the interpretations. Actual depths to the bedrock surface are within 10 percent of the estimates from seismic-refraction profiling. Till is not identified in these interpretations because it is generally thin and cannot be distinguished from stratified drift by use of seismic-refraction methods. Where till is present but is not identified in the interpretation, the computed depth to bedrock is slightly less than the actual depth.
4. Seismic-reflection profiling, another surface-geophysical method, was used to determine depths to bedrock and to infer the sediment type of the aquifers that lie beneath water bodies. Haeni (1986, 1988b) outlines the methods for collecting seismic-reflection data. Seismic-reflection results differ from seismic-refraction results in that information about the texture of the subsurface can sometimes be inferred from the reflection records.
5. Test borings were made at more than 60 locations to improve definition of the thicknesses and geohydrologic characteristics of the stratified-drift aquifers. (Locations of test borings are shown on plates 1-4.) Split-spoon samples of the subsurface materials were collected at 5- to 10-ft intervals to estimate the horizontal hydraulic conductivity at those depths and to determine the stratigraphic sequence of materials comprising the aquifers. Where test borings were made in relatively productive aquifer materials, a 2-in.-diameter well with a polyvinyl chloride (PVC) casing and a slotted well screen was installed. Water levels were measured periodically in these wells, and water samples were collected from selected wells.
6. Data from items 2, 3, 4, and 5 were used to construct maps showing the water-table altitude and saturated thickness of the stratified-drift aquifers.
7. Hydraulic conductivities of the aquifer materials were estimated from grain-size distribution data from 454 samples of aquifer material collected during the completion of test borings and wells in southern New Hampshire. Transmissivities were estimated from logs of test borings and wells by assigning horizontal hydraulic conductivities to each interval sampled, multiplying the hydraulic conductivities by the saturated thickness of the interval, and summing these results. Additional transmissivities were obtained from reports by geohydrologic consultants and from analysis of aquifer-test data. This information was used to prepare maps showing the transmissivity distribution of the stratified-drift aquifers (pls. 5-8).
8. Flow-duration data from a long-term (1941-78) streamflow-gaging station on the South Branch Piscataquog River, in the middle of the study area, were analyzed and used to correlate miscellaneous low-flow measurements on ungaged streams. Streamflows measured where the stream flowed into and

out of major aquifers in the area during periods of low flow can be used to estimate potential aquifer yields.

9. An aquifer in Goffstown was selected to demonstrate a technique for estimating yield on the basis of a two-dimensional numerical model that simulates ground-water flow. The computer program, developed by McDonald and Harbaugh (1988), is a three-dimensional model that can be used to simulate flow in two dimensions. This model was used to estimate the potential yield and the sources of water to wells in the modeled area.
10. Samples of ground water from 10 wells constructed during this study were collected and analyzed. Selected physical properties (specific conductance, pH, temperature) were measured, and concentrations of inorganic constituents were determined. The data provided by these analyses were used to assess the general quality of water from the stratified-drift aquifers.

Numbering System for Wells and Borings

Local numbers assigned to wells and borings entered into GWSI consist of a two-letter town designation (table 1), a supplemental letter designation ("A" for borings done for hydrologic purposes, "B" for borings done primarily for construction purposes, and "W" for all wells in which a casing was set), and a sequential number within each town. For example, the first well in the town of Goffstown is GNW-1.

Acknowledgments

The authors thank the many State and Federal agencies, municipalities, residents, consulting firms, well-drilling companies, and private companies who provided data for this study.

GEOHYDROLOGIC SETTING

Three types of aquifers are present in the study area: (1) stratified drift, which can be a major source of ground water for municipalities; (2) till, which locally can supply minor amounts of water for domestic use; and (3) bedrock, which supplies water to most households in the study area that are not connected to a municipal supply.

Stratified Drift

Coarse-grained stratified drift, the focus of this study, consists of sorted, mostly coarse-grained sediments (sands and gravels) deposited by glacial meltwater at the time of deglaciation. Hydrologic characteristics of these sediments that affect ground-water storage and movement are related to the glaciofluvial environment in which the sediments

Table 1.--*Town codes used in the numbering system for wells and borings*

Town	Two-letter code	Town	Two-letter code
Allenstown	AF	Greenfield	GS
Auburn	AU	Greenville	GV
Bedford	BI	Hooksett	HT
Bow	BU	Manchester	MC
Candia	CD	Mason	MG
Deering	DE	New Boston	NC
Derry	DF	New Ipswich	NJ
Dunbarton	DN	Temple	TM
Francestown	FC	Weare	WG
Goffstown	GN		

were deposited. Stratified-drift deposits are composed of distinct layers of sediments with different grain-size distributions, sorted according to the depositional environment. For example, fast-moving meltwater streams deposit coarse-grained sediments with large pore spaces between grains while fine-grained sediments are washed downstream and deposited in slow moving meltwater. If saturated, these sediments will store and transmit water readily. Fine-grained deposits, which include very fine sand, silt, and clay, were deposited in lacustrine (lake) environments characterized by slow-moving and (or) ponded meltwater; these fine-grained deposits do not transmit water as readily as do the coarse-grained deposits.

The deglaciation process had a pronounced effect in determining the type of stratified-drift deposit that was formed. Deglaciation of the study area is believed to have been a systematic process of stagnation-zone retreat (Koteff and Pessl, 1981). As the active glacial ice receded to the north, zones of stagnant ice remained in contact with the active ice margin that was in the valleys. As the ice continued to recede, new sediment was continuously being brought forward to the active margin and was available for deposition. Most of the stratified-drift aquifers in the study area are valley-fill deposits that can be identified as lacustrine deposits, eskers, kames, kame terraces, kame deltas, outwash, and outwash deltas.

Stratified drift deposited during the deglaciation of the Merrimack River valley was affected by the presence of two large glacial lakes--glacial Lake Merrimack and glacial Lake Hooksett. Thick layers of fine-grained sediment accumulated in the lakes while meltwater from the glacier deposited relatively coarse-grained deltaic sediments within the same lacustrine environment. The maximum probable extent of glacial-lake sediments associated with glacial Lake Merrimack and glacial Lake Hooksett is shown in figure 2. Elevations of glacial-lake levels were projected from measured altitudes of the contact between topset and foreset beds in remnant deltas in the Merrimack River valley. The contacts represent the maximum probable level of the glacial lakes in that area (Carl Koteff, U.S. Geological Survey, written commun., 1990).

Glacial-Lake Deposits

Coarse sand and gravel near the Merrimack River was deposited as deltas and outwash plains, ice-contact deltas or kame deltas, or other fluvial deposits that graded to what was once glacial Lake Merrimack and glacial Lake Hooksett. These two large glacial lakes occupied the present day Merrimack Valley and extended into numerous tributary valleys including those now occupied by the Piscataquog River and Cohas Brook (Koteff and others, 1984). Lacustrine silt and clay do not transmit water readily and impede ground-water flow. The coarse-grained deltaic deposits that are found within the fine-grained lacustrine deposits form coarse-grained aquifers that store and transmit water readily. A large delta in the town of Hooksett, a good example of this type of aquifer, is currently used to supply water for the town. A block diagram of the development of a typical glaciolacustrine deltaic aquifer is shown in figure 3.

Upland Valley-Fill Deposits

The various types of deposits that comprise valley-fill aquifers in the upland parts of the study area are shown in a block diagram in figure 4. The best examples of these aquifers are in Weare, New Boston, and Goffstown, where they are associated with the drainage of the Piscataquog River and the South Branch Piscataquog River. Valley-fill aquifers in this area can be characterized by morphosequence deposition of kames and eskers grading into deltas and outwash plains that are associated with the retreat of the ice margin in an ice-stagnation zone; such deposition commonly resulted in formation of small, temporary glacial lakes near the ice margin (Koteff and Pessl, 1981). The aquifers are coarse grained at the ice-contact end and become progressively fine grained and better sorted where the sediment-laden meltwater lost energy downstream from the ice margin and within the glacial lakes. Where stratified drift is found in small discontinuous deposits, aquifers tend to have consistent texture.

Till

Till is an unsorted mixture of clay, silt, sand, gravel, and rock fragments deposited directly by glacial ice. In this study, till covers most of the bedrock surface and is overlain locally by stratified drift and recent stream deposits. The thickness of till in southern New Hampshire is commonly less than 15 ft but locally can be as much as several tens of feet thick (Bradley, 1964, p. 21). In south-central New Hampshire, till can be divided into an upper till and a lower till (Koteff, 1970, Goldthwait and others,

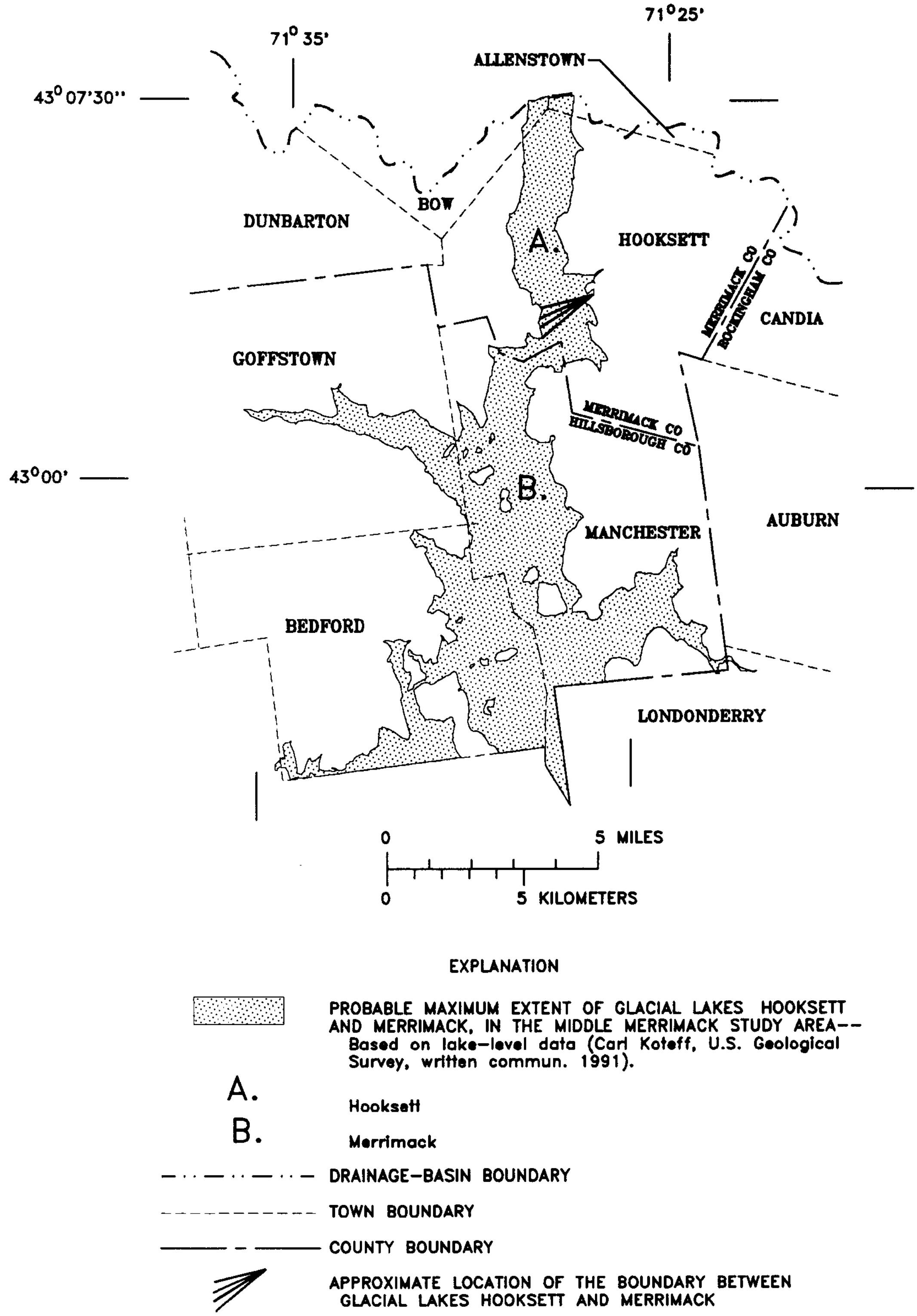


Figure 2.--Probable maximum extent of glacial Lakes Merrimack and Hooksett.

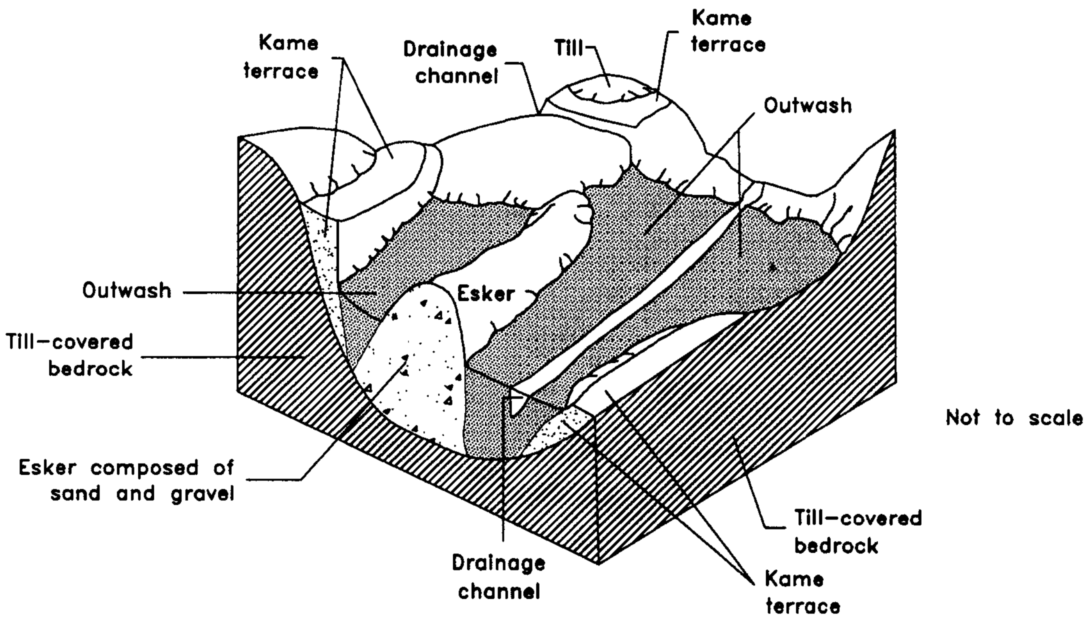


Figure 3.--A glaciolacustrine deltaic aquifer.

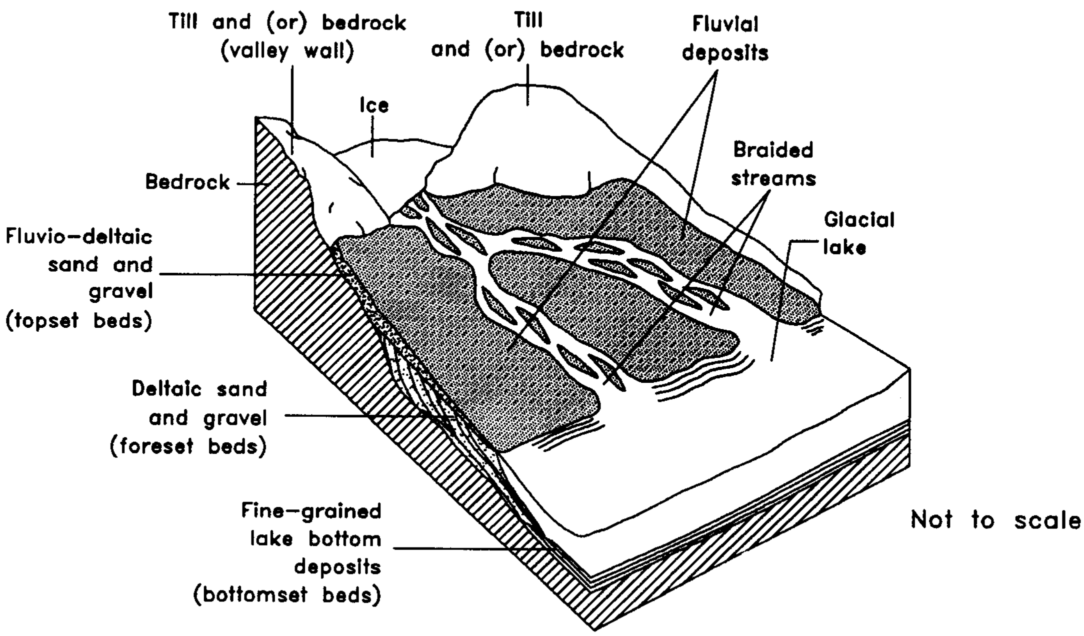


Figure 4.--A valley-fill aquifer composed of outwash and ice-contact deposits.

1951). The two tills are thought to represent two separate major ice advances over the area (Koteff, 1970).

Till is generally not considered to be a major source of ground water because of its low hydraulic conductivity. Large-diameter dug wells completed in till can provide modest amounts of water (commonly less than 3 gal/min) for household needs, but water-level fluctuations within till can be large enough to make these wells unreliable during dry seasons.

Bedrock

Bedrock in the southeastern part of the study area, southeast of the Campbell Hill Fault, consists primarily of metamorphic rocks of pre-Silurian and Precambrian age, including gneiss, slate, schist, quartzite, and metavolcanic rocks (Lyons and others, 1986). Towns or municipalities in this area are Auburn, Bedford, Candia, Manchester, and southeastern parts of Goffstown, Hooksett, and Mason (fig. 1). Bedrock in the northwestern part, northwest of the Campbell Hill Fault, consists primarily of Ordovician to Silurian schist, gneiss, and quartzite. In both sections of the study area, these rocks were intruded by granite, granodorite, syenite, monzonite, and diorite of Devonian and Silurian age (Lyons and others, 1986). The rocks trend in northeasterly belts that parallel the region's structural grain (Lyons and others, 1986). Major fault zones trend northeasterly and are parallel to regional structure. Secondary fractures cut across the primary fractures.

Ground water enters wells completed in bedrock through fractures that are intersected by the well. The yields of these wells depend on the number, size, and degree of interconnection of the fractures. Wells that tap bedrock commonly yield small supplies of water suitable for drinking and other domestic uses. The yields of bedrock wells inventoried for this study ranged from 0.25 to 150 gal/min; the median yield was 7 gal/min. Bedrock wells are capable of yields sufficient for municipal supply where fractures are large and numerous (Cotton, 1985).

GEOHYDROLOGY OF STRATIFIED-DRIFT AQUIFERS

The geohydrology of stratified-drift aquifers was described by identifying (1) aquifer boundaries, (2) direction of ground-water flow from recharge to discharge areas, (3) aquifer thickness and storage, and (4) aquifer transmissivity. Data sources in this investigation included surficial geology maps, records of wells and test borings, and seismic-refraction and seismic-reflection data. Results of the geohydrologic investigation are presented on plates 1-8 and in the text that follows.

Delineation of Aquifer Boundaries

Stratified-drift aquifers in the study area are composed of fine- to coarse-grained sands or sands and gravels deposited by glacial meltwaters; these deposits, in part, are now sufficiently saturated to yield significant quantities of water to wells and springs. The lateral boundaries of the aquifers are defined as the contacts between the stratified drift and till or bedrock valley walls. The position of the contact was determined by use of surficial geology maps, soil maps, test-boring logs, and field mapping done specifically for this study. The bottom boundary is the till and (or) bedrock surface and was determined from analysis of data from seismic-refraction and seismic-reflection surveys, test borings, and domestic water wells. The upper boundary is the water table.

Areal Extent of Aquifers

The areal extent of the stratified-drift aquifers is shown on plates 1-8. Because of the regional scale of this investigation, aquifer boundaries are approximate. The approximate limits of lacustrine deposits associated with glacial Lakes Merrimack and Hooksett are shown in figure 2. Coarse-grained stratified-drift aquifers may be present beneath fine-grained lacustrine deposits but may not have been identified because of the complexity of the stratigraphy and the lack of data. Available data for coarse sediment underlying fine-grained sediment are discussed in the section "Descriptions of Selected Stratified-Drift Aquifers." Although the lacustrine clay, silts and very fine sands are not capable of supplying adequate amounts of water for domestic and community use, the coarse-grained deposits that may lie below could be productive aquifers.

All aquifer boundaries are shown as solid lines. In the explanation on the plates, solid lines represent "approximately located" boundaries. The lateral boundaries of stratified-drift aquifers were delineated from the previously cited published and unpublished surficial geology maps and by interpretation of soil maps of Rockingham, Hillsborough, and Merrimack Counties (Koteff, 1970; Gephart, 1985a,b; Carol Hildreth, Office of the New Hampshire State Geologist, written commun., 1990; Carl Koteff, U.S. Geological Survey, written commun., 1990; Koteff and Stone, 1990).

Stratigraphy of Geohydrologic Units

Data used to define the stratigraphy of geohydrologic units were obtained from existing records of subsurface exploration within the project area. Other test drilling and surface geophysical exploration (seismic refraction and marine seismic reflection) were done to delineate texturally different geohydrologic units within the stratified drift.

Well and boring data

Subsurface data from wells and borings were inventoried, and data locations within the stratified-drift aquifers are plotted on plates 1-4. Geohydrologic data for approximately 3,350 sites have been added to the GWSI data base and checked for accuracy. Data for approximately 2,600 of the 3,350 sites were transferred to GWSI from the NHDES-WRD well-inventory data base. Approximately 420 of the 2,600 NHDES-WRD sites are within stratified-drift aquifer areas. Approximately 750 sites of the 3,350 total sites added to the data base are located in the stratified-drift aquifer areas. Appendix A contains selected data from the GWSI data base for wells and borings within the stratified-drift aquifer areas that were used to construct the accompanying map plates. These data include an identification number for the well, latitude and longitude, depth of the well, water level, and yield of the well. Appendix B contains stratigraphic logs of selected wells and borings in stratified drift. These data were used primarily for estimating the transmissivity of the aquifers where no aquifer-test data or grain-size data were available.

Seismic-refraction data

Seismic-refraction profiles, totaling over 10 mi, were completed at 76 locations to determine depths to the water table (pls. 1-4) and depths to the bedrock surface (pls. 5-8). A 12-channel, signal-enhancing seismograph was used to record arrival times of compressional wave energy generated by a sound source. The data were collected and interpreted according to methods described by Haeni (1988a). The interpretations, made with the aid of a computer program developed by Scott and others (1972), are shown in appendix C. Estimated depths to the water table and to the bedrock surface are generally compared with control data, such as nearby well or boring logs and water-table and bedrock-outcrop observations. The accuracy of the depths to water table and bedrock are within 10 percent of the true depth, as determined from test borings made along selected profiles.

Seismic-reflection data

High-resolution, continuous seismic-reflection data were collected according to methods described by Haeni (1986) along the approximately 14-mi-long reach of the Merrimack River within the study area. Data were also collected on navigable reaches of the Piscataquog River from near its mouth upstream to the town of Goffstown. These data were used to map depths to the bedrock surface beneath the two rivers. During data collection, an array of receivers was towed behind a boat that traveled slowly up or down the river. Compressional waves, generated from a sound source, penetrated the river bottom and were reflected back to the surface in response to the physical differences in the geologic strata. The reflected sound waves were received at the water surface and converted to an electrical signal displayed on a graphic recorder. Data-collection was often affected by the presence of strong reflectors at the water bottom causing multiples of the water-bottom record to obscure any data below. This technique is discussed in detail by Haeni (1988b) and by Morrissey and others (1985).

Altitude of the Water Table

The approximate altitude of the water table within the stratified drift is shown on plates 1-4. These maps were constructed from (1) altitudes of streams, ponds, rivers, and lakes as shown on 1:24,000-scale USGS topographic maps; (2) water-level data from wells stored in GWSI; and (3) analysis of seismic-refraction data. Ground-water altitudes in fine-grained lacustrine deposits represent the ground-water altitude in those deposits only. Saturated coarse-grained stratified drift may be present below fine-grained material in some areas, and a second, deeper potentiometric surface (in confined aquifers) may be present.

Water-level measurements were made seasonally at selected wells in the study area during 1988 and 1989 and were stored in GWSI. Long-term hydrographs showing water levels in two representative wells (MOW-36 and CVW-4) near the study area are shown in figure 5. Well MOW-36 represents water-level fluctuations in a medium- to coarse-grained stratified-drift aquifer. Well CVW-4 represents water-level fluctuations in fine sands, silts, and clay. The data from these wells support the conclusion reached for other parts of New Hampshire (Cotton, 1987; Toppin, 1987; Moore, 1990; Mack and Lawlor, 1992; Moore and others, in press) that natural water-level fluctuations in coarse-grained stratified drift are usually less than 5 ft but can be as much as 10 ft; therefore, a 20-ft contour interval for water-table altitudes under natural conditions is reasonable for a generalized water-table map constructed from water-level measurements made at different times.

Recharge, Discharge, and Direction of Ground-Water Flow

Ground-water recharge includes natural recharge from precipitation that falls directly on the aquifer and infiltrates the water table, lateral inflow from adjacent till and bedrock areas, and, in some places, leakage from streams that traverse the aquifer. Natural recharge is the difference between precipitation and the amount of water lost to evapotranspiration and to surface runoff.

Recharge to stratified-drift aquifers in this study can be estimated from stream-discharge measurements made during periods in which there is no change in ground-water storage, as indicated by the position of the water table. Such estimates require the assumption that the ground-water discharge consists of mostly ground-water runoff. During periods of low flow and after several days without precipita-

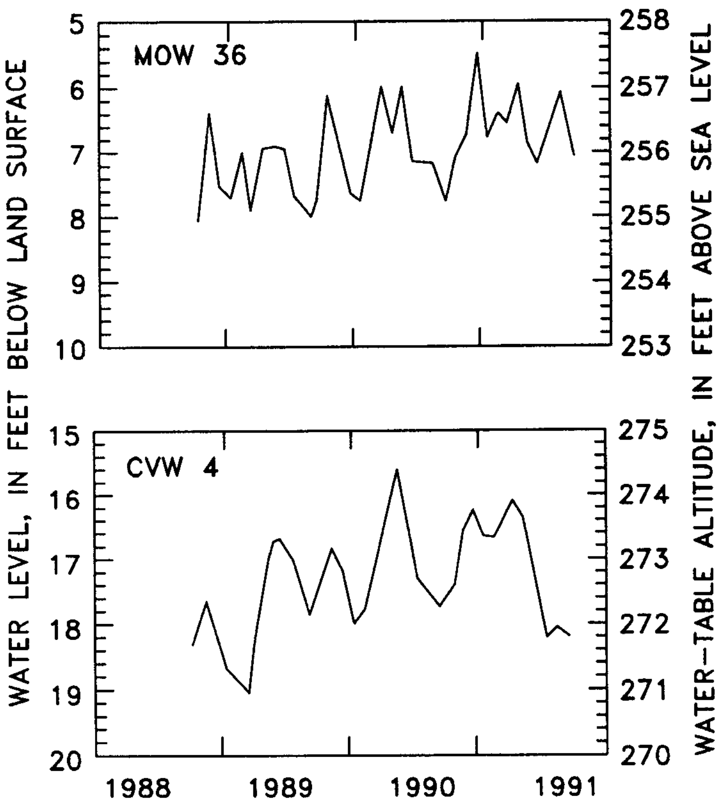


Figure 5.--Water-level hydrographs of observation wells MOW-36 and CVW-4.

tion, the assumption is reasonable. This method probably gives conservative estimates of natural recharge to aquifers.

Streamflow-gaging station 01091000, on the South Branch Piscataquog River in the central part of the study area (pl. 3), was used to monitor flow conditions in the basin. On September 6, 1989, streamflow at this site was at a rate equaled or exceeded 93 percent of the time after 5 days without precipitation. Under these conditions, flow within the basin was low, and ground-water discharge was assumed to be natural recharge from ground-water runoff.

Recharge to stratified-drift aquifers from streams that lose water to the aquifer through permeable streambeds was documented by Randall (1978) and by Morrissey and others (1989). This type of recharge was not observed in any of the base-flow measurements made in this study, although it probably occurs on a small scale within the ±5-percent error associated with base-flow measurements. Such tributary-stream infiltration is common where the tributary streams flow into aquifers that have a deep water table at the stratified-drift, till, and (or) bedrock contact relative to the streambed altitude (D.J. Morrissey, U.S. Geological Survey, written commun., 1989).

Recharge to the stratified-drift aquifers comes, in part, from adjacent till and (or) bedrock uplands. Lateral inflow from upland areas not drained by perennial streams recharges the stratified-drift aquifer at the till and (or) bedrock contact. Recharge to stratified-drift aquifers from upland areas not drained by streams can be estimated by measuring ground-water discharge from till and (or) bedrock uplands that are drained by streams. For a stream in Maine, the estimated average annual lateral inflow of ground water from upland areas to a stratified-drift aquifer was 0.5 $(ft^3/s)/mi^2$ (Morrissey, 1983). Upland areas not drained by streams are generally small but may contribute a significant amount of recharge to aquifers.

Ground-water discharge includes natural leakage into streams, lakes, and wetlands; ground-water evapotranspiration; and withdrawal from wells. During periods of low streamflow, usually in late summer and early fall and after several days without rainfall, streamflow consists almost entirely of ground-water discharge. Streamflow measurements were made during such periods in October 1988 and September 1989 (appendix D). These measurements represent approximately 90-percent flow duration and 93-percent flow duration, respectively. Most of this discharge is assumed to be ground-water runoff, and, thus, it can be used as an estimate of recharge to aquifers in the study area. Further discussion of these measurements is found in the section of the report titled "Description of Selected Stratified-Drift Aquifers."

Direction of ground-water flow in an unconfined aquifer is determined by the water-table gradient. Water-table gradients differed throughout the study area depending on topography and hydraulic conductivity of the stratified-drift deposits. Water-table gradients in fine-grained stratified drift commonly exceeded 5 percent in areas of high topographic relief. Water-table gradients in coarse-grained stratified drift in areas of low topographic relief were less than 0.1 percent. Potentiometric surfaces within confined aquifers (coarse-grained deposits beneath fine-grained deposits) were not contoured because of insufficient data.

Aquifer Characteristics

The geohydrology of stratified-drift aquifers shown on plates 5-8 is based partly on aquifer characteristics that include saturated thickness, storage, and hydraulic conductivity. Estimates of saturated thickness and hydraulic conductivity were used to calculate transmissivity (pls. 5-8). These properties can be used to assess the water-supply potential of stratified-drift aquifers. Values of aquifer storage can be used to estimate aquifer yield.

Saturated Thickness and Storage

Saturated thickness of an unconfined stratified-drift aquifer is the vertical distance between the water table and the base of the aquifer. For many stratified-drift aquifers, the bottom is the till or bedrock surface; for other aquifers, the bottom is the contact between the upper coarse-grained deposits and the underlying fine-grained lacustrine deposits. Saturated thicknesses depicted on plates 5-8 include these fine-grained deposits. Saturated-thickness contours were constructed from test-boring and well data and seismic-refraction and seismic-reflection profiles. The saturated thickness multiplied by the specific yield of an unconfined aquifer determines the amount of ground water that can be released from storage.

The storage coefficient of an aquifer is defined as the volume of water released from or taken into storage per unit surface area of aquifer per unit change in head (Lohman and others, 1972). In unconfined aquifers, the storage coefficient is approximately equal to the specific yield--the amount of water released by gravity drainage from a unit volume of aquifer per unit decrease in hydraulic head. A value of 0.2 is commonly used for specific yield for stratified-drift aquifers in New England (Moore, 1990) and for unconsolidated deposits in other areas (Freeze and Cherry, 1979). Specific yields of 13 samples of stratified drift from southern New Hampshire ranged from 0.14 to 0.34, with an average of 0.26 (Weigle and Kranes, 1966). On the basis of data collected during a 3-day aquifer test done for this study in the Goffstown aquifer, the specific yield ranged from 0.21 to 0.29.

Water released from storage in confined aquifers results from expansion of water and compression of the aquifer as hydraulic head declines. Storage coefficients for confined aquifers, which are significantly smaller than specific yields for unconfined aquifers, range from 0.00005 to 0.005. Small storage coefficients indicate that the amount of water derived from expansion and aquifer compression is much less than that from dewatering by gravity drainage.

Saturated-thickness maps can be used to estimate the amount of ground water stored in an aquifer that is available for use. The saturated volume of an unconfined aquifer is approximately equal to the sum of the products of the areas between successive pairs of saturated-thickness contours multiplied by the average saturated thickness for each area. The actual volume of ground water stored in the aquifer is the product of the saturated volume multiplied by the porosity.

Saturated-thickness maps (pls. 5-8) were constructed from data obtained from surficial geologic maps, seismic-refraction and seismic-reflection profiles, and records of well and test borings. Saturated thicknesses exceeded 120 ft in places. The values calculated for saturated thicknesses included the thickness of all stratified drift regardless of grain size. Layers of clay, silt, and fine sand that overlie, underlie, or are interfingered with the aquifer deposits are included in the thicknesses depicted on plates 5-8. This inclusion of fine material is important to note where glacial Lake Merrimack and glacial Lake Hooksett deposits are present along the Merrimack River and associated tributaries (fig. 2).

Transmissivity and Hydraulic Conductivity

Aquifer transmissivity is defined as the rate at which water at the prevailing kinematic viscosity can be transmitted through a unit width of an aquifer under a unit hydraulic gradient (Lohman and others, 1972). The transmissivity (T) of an aquifer is equal to the saturated thickness (b) multiplied by the horizontal hydraulic conductivity (K, a directional measure of the permeability) and is expressed in feet squared per day; thus,

$$T = Kb, \tag{1}$$

Aquifer transmissivity at a specific site was derived from estimates of hydraulic conductivity of lithologic units in the aquifers. Hydraulic conductivity, in turn, was estimated from grain-size distributions of samples of aquifer materials by use of the regression equation developed by Olney (1983). Hydraulic conductivity, however, which has a vertical and a horizontal vector component, is not accounted for by this equation. In this relation, an effective grain size (D_{10}, in Phi units) was used to estimate hydraulic conductivity (K, in feet squared per day) with the following equation:

$$K = 2{,}100 \times 10^{-0.655(D_{10})}, \tag{2}$$

The effective grain size (D_{10}) is a controlling factor for the hydraulic conductivity of stratified drift in New Hampshire. Effective grain size is defined as that grain size where 10 percent of the sample is finer than the effective grain size and the remaining 90 percent is coarser than the effective grain size. Olney (1983) developed this relation from the results of permeameter tests of stratified-drift samples from Massachusetts. Moore (1990) found that this relation yielded results that fall within the range of results from other relations that have been developed between grain size-size distribution and hydraulic conductivity (Krumbein and Monk, 1942; Bedinger, 1961; and Masch and Denney, 1966). Comparisons with aquifer-test data, however, indicate that equation 2 may not give accurate results for very coarse-grained sand and (or) gravel. Estimates of hydraulic conductivity for aquifers with coarse sands and gravels were, in part, based on comparisons to aquifer-test data for similar deposits. Hydraulic conductivity (and transmissivity) based on grain-size relations are only estimates and may differ significantly from results of aquifer tests.

Hydraulic conductivity was estimated for 454 samples of stratified drift from southern New Hampshire by means of equation 2. The samples were collected in the Exeter and Lamprey River basins (Moore, 1990); in the seacoast area and the lower Merrimack River basin (Flanagan and Stekl, 1990); in the Bellamy, Cocheco, Salmon Falls River basins (Mack and Lawlor, 1992); in the lower Connecticut River basin (Moore and others, in press); in the Contoocook River basin (P.T. Harte and others, U.S. Geological Survey, written commun., 1991), and for this study. The grain-size distribution and the effective grain size (D_{10}) were determined for these 454 samples.

Hydraulic conductivities calculated from equation 2 were plotted against median grain size in phi groups, and the resulting plot was divided into three categories of degree of sorting (fig. 6). These categories are strictly relative and are used to describe the types of stratified-drift aquifer deposits found in New Hampshire. The degree of sorting was based on the standard deviation of each individual sample. These relative categories are described in the following paragraph.

If standard deviations were large (greater than 1.75 phi), the samples were considered "poorly sorted"; if standard deviations were intermediate (1.25 phi to 1.75 phi), the samples were considered "moderately sorted"; and if standard deviations were small (less than 1.25 phi), the samples were considered "well sorted." A regression equation was developed for each of the three categories to determine the relation between hydraulic conductivity and median grain size (fig. 6). The coefficient of determination (R^2) was 0.93 for the "well sorted" samples, 0.72 for the "moderately sorted" samples, and 0.54 for the "poorly sorted" samples. The calculated hydraulic conductivity, grouped by ranges of median grain size and by ranges of standard deviation (degree of sorting), is shown in table 2.

Hydraulic conductivities were calculated for each median phi group and were averaged to determine a mean hydraulic conductivity per group. For example, the mean hydraulic conductivity of sediment samples whose median grain size was described as medium sand and "well sorted" was 38 ft/d (the average of 25 and 51 ft/d; table 2).

Very fine sand, silt, and clay deposits in the study area were not analyzed for grain-size distribution because their hydraulic conductivities are typically low (less than 4 ft/d) and, therefore, considered insignificant (Todd, 1980). Estimates of horizontal hydraulic conductivity for coarse sand and gravel were determined by analysis of aquifer-test data from municipal wells in Goffstown and Hooksett. Such data were not available elsewhere.

The values in table 2 were used to estimate hydraulic conductivities from lithologic descriptions given in logs from test borings and wells. For example, for a lithologic description of 10 ft of

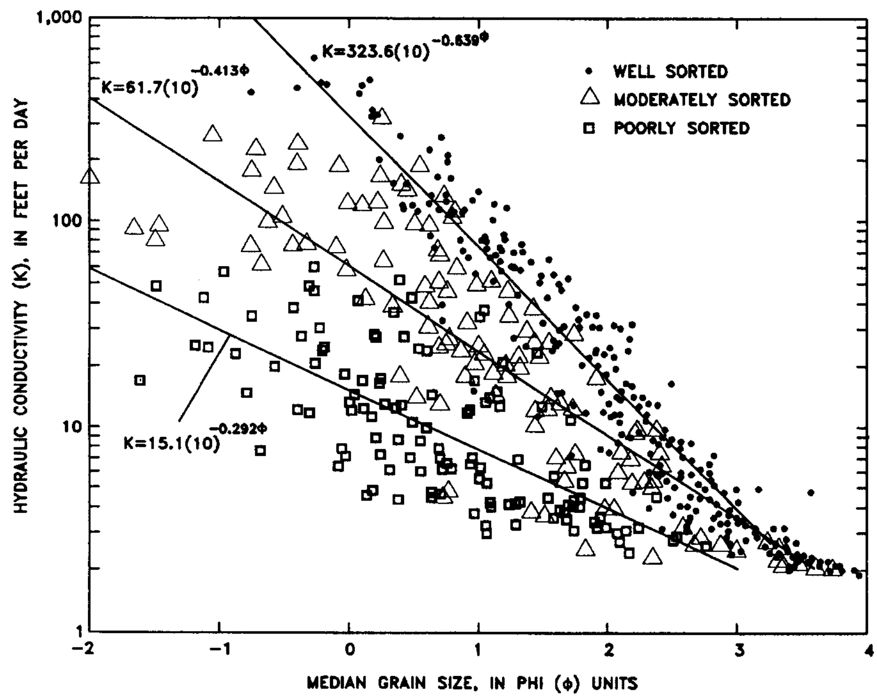


Figure 6.--Relation between estimated hydraulic conductivity, median grain size, and degree of sorting.

Table 2.--*Relation of mean hydraulic conductivity to median grain size and degree of sorting of aquifer material*

[<, less than; >, greater than; --, no data]

Median grain size (phi units)	Median grain description	"Well sorted" standard deviation <1.25 phi	"Moderately sorted" standard deviation 1.25 phi to 1.75 phi	"Poorly sorted" standard deviation >1.75 phi
		Mean hydraulic conductivity (K), in feet per day		
-1.75	granules	--	320	49
-1.25	granules	--	200	35
-.75	very coarse sand	970	120	25
-.25	very coarse sand	470	78	18
.25	coarse sand	220	48	13
.75	coarse sand	110	30	9
1.25	medium sand	51	19	7
1.75	medium sand	25	12	5
2.25	fine sand	12	7	3
2.75	fine sand	6	4	2
3.25	very fine sand	3	3	--
3.75	very fine sand	2	2	--

"moderately sorted" coarse sand overlying 20 ft of "well sorted" fine sand overlying bedrock, the hydraulic conductivities assigned would be 39 ft/d (the average of 30 and 48 ft/d) and 9 ft/d (the average of 12 and 6 ft/d), respectively. The estimate of transmissivity, based on the same description, would be (10 ft $\times$ 39 ft/d) + (20 ft $\times$ 9 ft/d) or 570 ft^2/d.

Descriptions of Selected Stratified-Drift Aquifers

The most extensive and most productive stratified-drift aquifers in the study area (fig. 7) are discussed in this section. Aquifers are discussed from south to north and from west to east, beginning at the southwestern part of the area.

Stratified-drift aquifers that are shown on the southern plate (pl. 1) are characteristically thin and discontinuous and may contain fine-grained glaciolacustrine sediment. Whereas these aquifers may not be useful for a municipal supply, they may be adequate for domestic supply. Accordingly, many old homes in the area have shallow dug wells. The most productive aquifers are described below.

Gould Mill Brook Aquifer

The Gould Mill Brook aquifer, largely in the eastern part of the town of Mason and partly in the town of Brookline (pl. 1, fig. 7), is composed of sand, gravel, and minor silt deposited in a glaciolacustrine environment. The aquifer can be as much as 70 ft thick (Koteff and Stone, 1990). Test drilling of well MGW-1 (pl. 1) revealed 40 ft of saturated sand and a transmissivity greater than 1,000 ft^2/d. This deposit is thinner south of MGW-1.

Smithville Aquifer

The Smithville aquifer is in the town of New Ipswich, 0.4 mi west of Smithville at the Smithville Flood Control dam (pl. 1, fig. 7). Saturated thickness of this aquifer exceeds 60 ft, and the transmissivity ranges from 1,000 to 2,000 ft^2/d. Water retained behind an earthen dam may enhance recharge and storage in the aquifer and increase its potential for ground-water resources.

Upper Stony Brook Aquifer

The upper Stony Brook aquifer, at Russell Station Road in the town of Greenfield (pl. 2, fig. 7), is 2.6 mi southeast of Greenfield Village center at the headwaters of Stony Brook. This small, isolated aquifer is mainly composed of coarse-grained stratified drift. The saturated thickness is approximately 20 ft throughout much of the aquifer and is greater than 40 ft in the center of it. Although the aquifer is small, the coarse-grained, uniform sediment make this a potentially productive aquifer for a domestic or small community water supply. Estimated transmissivities exceeded 4,000 ft^2/d in the deep, central zone. A small part of the aquifer is within the town of Lyndeborough (Toppin, 1987; pls. 1-2).

Upper South Branch Piscataquog River Aquifer

The upper South Branch Piscataquog River aquifer, which begins in Francestown near the headwaters of the South Branch Piscataquog River (pl. 2, fig. 7), extends along the river valley south into Lyndeborough and heads northeast from there into New Boston. The saturated thickness of this aquifer is generally greater than 20 ft but exceeds 80 ft in the deeper sections near the Lyndeborough-New Boston town line. Part of the aquifer fills an overdeepened channel scoured by glacial ice along the Francestown Turnpike. Saturated thicknesses range from 40 to 60 ft (pl. 6). Test borings south of Francestown along the Francestown Turnpike indicate that fine-grained lacustrine deposits are present throughout the entire saturated thickness of the aquifer. Similar fine-grained sediment is also present at the southernmost part of the aquifer near the confluence of Cold Brook. To the northeast, test borings (NCW-186) and surface observations indicate coarse-grained deposits and saturated thicknesses that exceed 40 ft. Cobble gravel at the surface prevented drilling and sampling in the area adjacent to Lyndeborough Road, 1 mi southwest of New Boston. Kames and eskers in this area indicate the likelihood of coarse-grained deposits below the surface. Transmissivity in this part of the aquifer is probably less than 2,000 ft^2/d, but exceeds 1,000 ft^2/d, indicating the potential for domestic or small community water supply.

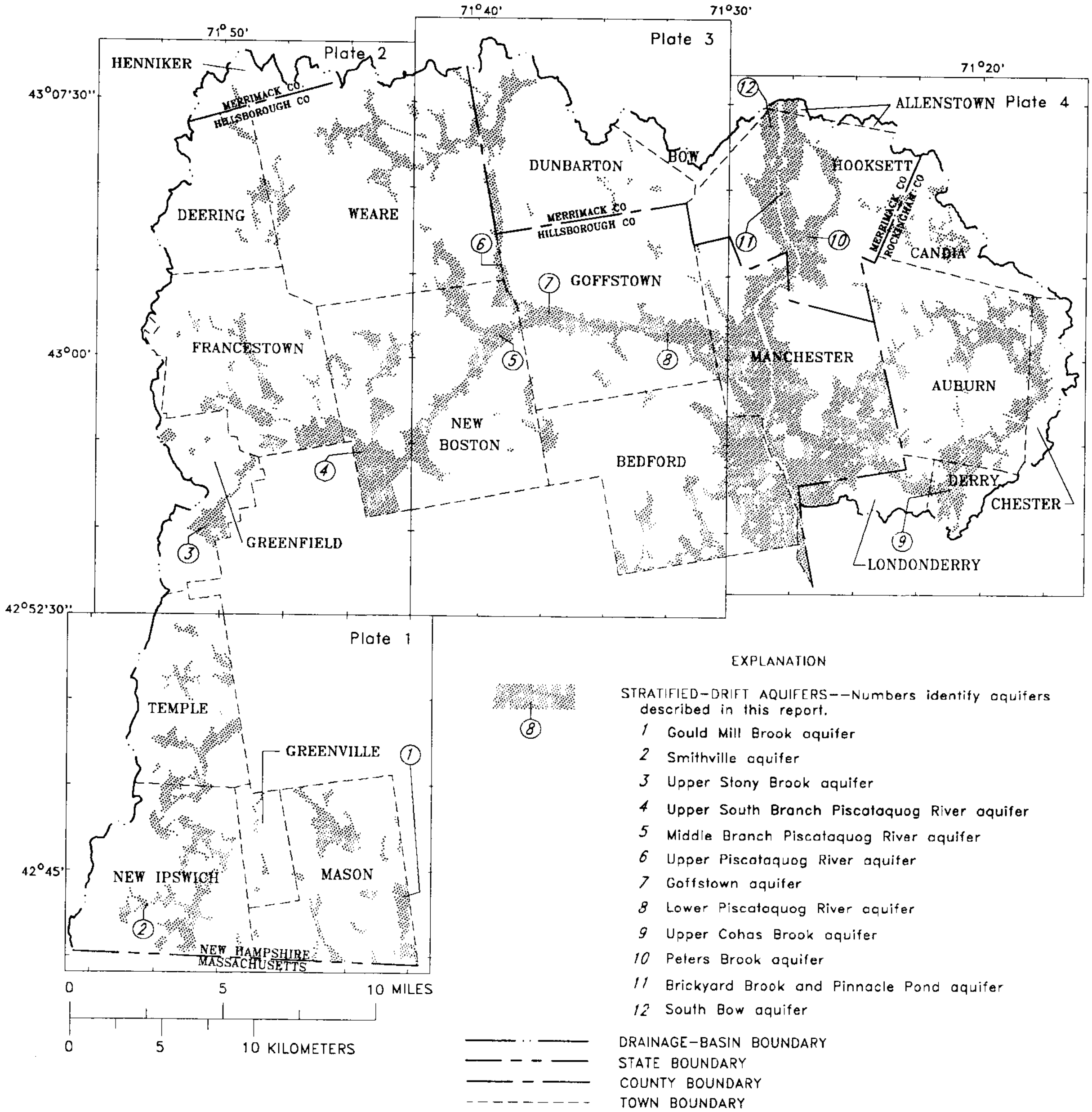


Figure 7.--Locations of aquifers.

Middle Branch Piscataquog River Aquifer

The Middle Branch Piscataquog River aquifer (pl. 3, fig. 7) extends north up the valley of the Middle Branch Piscataquog River from the confluence of the Middle Branch Piscataquog River and the South Branch Piscataquog River in New Boston. An extensive delta at the confluence is thought to be coarse grained and a potentially productive area within the aquifer; however, no data are available because of lack of access to the property. Saturated thickness near the delta may exceed 60 ft. Saturated thicknesses are greater than 20 ft in the middle and upper parts of the stratified-drift aquifer and exceed 40 ft in the northern part. Estimated transmissivity for the northern area exceeds 1,000 ft^2/d. Several year-round and seasonal residents currently withdraw water from shallow dug wells.

Upper Piscataquog River Aquifer

The upper Piscataquog River aquifer in Weare (pl. 3, fig. 7) below Everett Lake is bounded by Everett Dam to the north and by Riverdale Dam to the south (pl. 2). This narrow, north-south valley-fill aquifer has an average width of 1,500 ft and consists of less than 10 ft of medium to coarse-grained saturated valley-fill deposits overlying thick fine-grained sands and silt. The saturated thickness of this deposit is greater than 90 ft in places, despite the narrowness of the valley. The estimated transmissivity of fine-grained deposits is less than 2,000 ft^2/d. An aquifer with this transmissivity may not be adequate to support a municipal water supply, but it is suitable for a domestic or small community water supply. Currently (1992), the Kuncanowet Hills Mobile Home Park withdraws approximately 5,000 gal/d (M.A. Horn, U.S. Geological Survey, written commun., 1992) from two shallow dug wells in this aquifer to supply water to about 80 people (New Hampshire Water Supply and Pollution Control Division, written commun., 1991).

Flow measurements made on the Piscataquog River at sites 11 and 13 (appendix D) on September 6, 1989, indicate an approximate increase in flow of 1.13 ft^3/s (500 gal/min) in 3.6 mi. These flow measurements can be used as an index of aquifer yield.

Goffstown Aquifer

The Goffstown aquifer is immediately west of the Goffstown town center and underlies an area of approximately 1.2 mi^2 (pl. 3, fig. 7). The aquifer is situated at the confluence of the Piscataquog River and the South Branch Piscataquog River. Saturated thicknesses in this aquifer exceed 60 ft in places and average 40 ft (fig. 8). Transmissivities for the coarse-grained sediments exceed 8,000 ft^2/d in the center of the aquifer and average greater than 2,000 ft^2/d for most of the aquifer. The aquifer is thought to be composed of deltaic sands and gravels that were deposited in glacial Lake Merrimack when it occupied this part of the Piscataquog River valley.

A 3-day aquifer test was done by the USGS by pumping well GNW-1 at a well field owned by the Goffstown Water Precinct. Time, distance, and drawdown data obtained during the test were analyzed according to a method by Neuman (1974) that accounts for partially penetrating wells. Horizontal hydraulic conductivities near well GNW-1 ranged from 250 to 350 ft/d. The average ratio of horizontal to vertical hydraulic conductivity was 10:1. Transmissivities were determined to be greater than 9,000 ft^2/d at GNW-1. Two wells at this site are currently used to augment water withdrawals from a surface-water reservoir and average daily withdrawals in 1990 were about 0.071 Mgal/d for August, September, and October (New Hampshire Department of Environmental Services, Water Management Bureau, written commun., 1991). This small aquifer may be capable of supplying large amounts of water for municipal use. The yield of this aquifer is discussed in detail in the section "Estimation of Aquifer Yield for the Goffstown Aquifer."

Lower Piscataquog River Aquifer

The lower Piscataquog River aquifer is downstream from Goffstown village and is almost entirely within the area formerly occupied by glacial Lake Merrimack (pl. 3, fig. 7). Generally, this aquifer has low potential for ground-water withdrawal because of the extent of fine-grained lacustrine deposits associated with the former glacial lake. Most of the fine-grained stratified drift is overlain by thin, medium to coarse-grained delta and (or) outwash sands and gravel. Throughout the aquifer, the Piscataquog River has eroded to the bedrock surface, which defines the aquifer bottom in this area. Most of the lower Piscataquog River stratified-drift

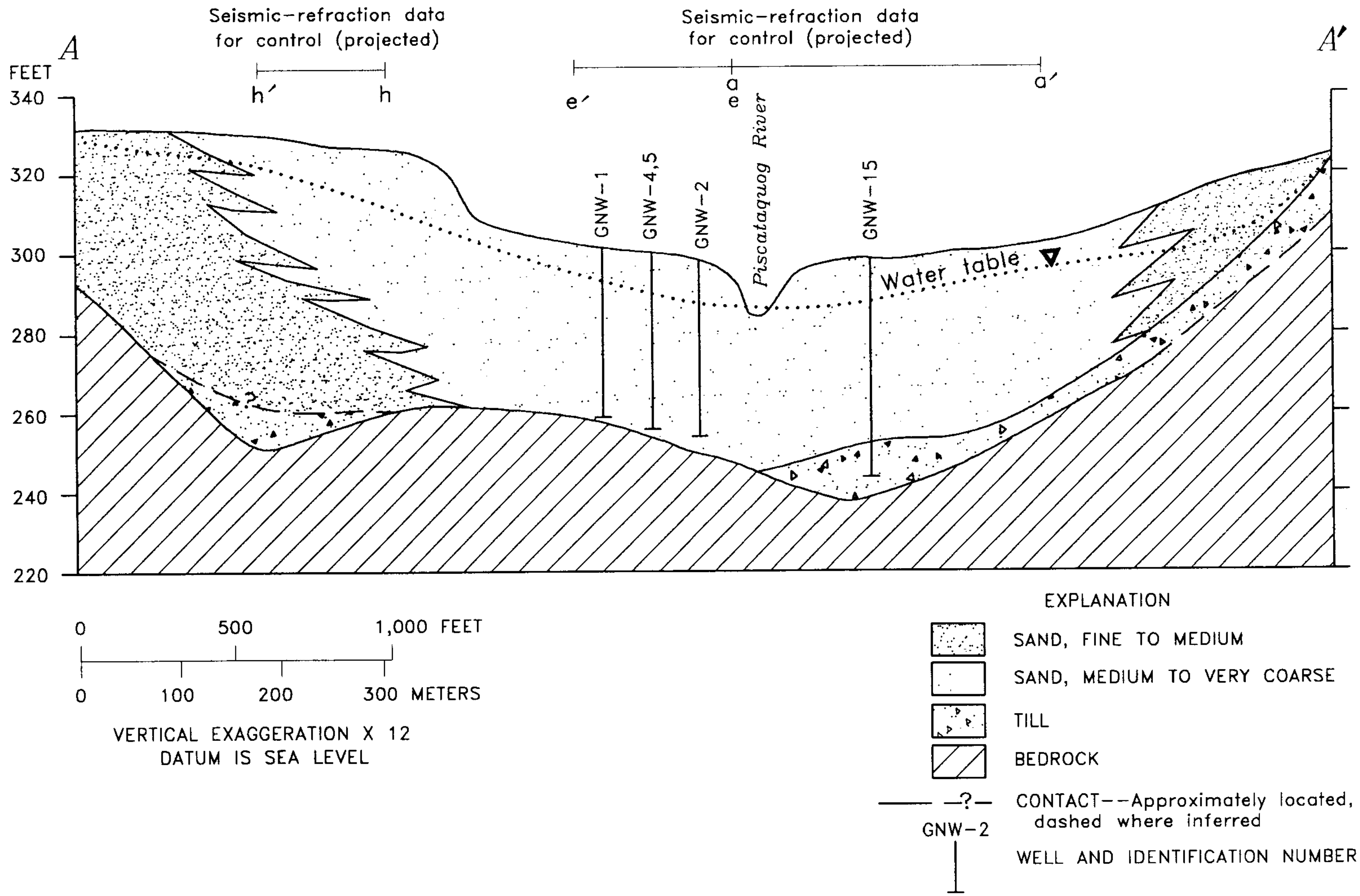


Figure 8.--Geologic section through the Goffstown aquifer.

deposits are terraced and are composed of unsaturated thin coarse-grained sediments overlying saturated fine-grained sediments. Water-table gradients of 5 percent are found in this area. Where saturated, however, the coarse-grained stratified drift may be a valuable aquifer for a domestic or small community water supply.

Upper Cohas Brook Aquifer

The upper Cohas Brook aquifer is in the northeastern corner of Londonderry (pl. 4, fig. 7). The aquifer is composed of coarse-grained ice-contact sand and gravel overlying glaciolacustrine fine sands. Transmissivities exceeded 2,500 ft^2/d in parts of the aquifer. Contamination from buried drums containing volatile organic carbons (VOC's) may limit the use of this aquifer as a potable water supply. This site is on the National Priority List of hazardous-waste sites (U.S. Environmental Protection Agency, 1986) and the contamination problem is discussed in a report by Stekl and Flanagan (1992).

Peters Brook Aquifer

The Peters Brook aquifer is approximately 2 mi south of Hooksett Village in Hooksett along the Merrimack River valley (pl. 4, fig. 7). Meltwater, flowing south along what is now the Peters Brook drainage, deposited deltaic sediments that built across glacial Lake Merrimack and eventually closed off the valley. This delta became a stratified-drift dam that created glacial Lake Hooksett (Koteff and others, 1984). The water surface of glacial Lake Hooksett was approximately 15 ft higher than the water surface of glacial Lake Merrimack to the south. Deltas that formed later, to the north of this delta, were graded to the level of glacial Lake Hooksett (Koteff and others, 1984). Test borings HTW-18, HTW-19, and HTW-20 drilled in the delta show that coarse-grained sand and gravel overlies fine sand and silt; however, most of the coarse-grained deposits have been excavated. The borings also show that the bedrock surface is relatively flat but deepens sharply near the present day Merrimack River (fig. 9). For example, test borings at wells HTW-18 and HTW-19 (pl. 4) indicate that bedrock is present 50 ft below the surface. Test boring HTA-3 (500 ft to the west) indicates bedrock is present 114 ft below the surface. Additional data pertaining to the surficial geology and hydrogeology can be found in a report by BCI Geonetics and Caswell (1980).

The saturated thickness of the Peters Brook aquifer increases from less than 20 ft in the east to greater than 100 ft near the Merrimack River. The large saturated thickness near the river does not contribute significantly to the transmissivity of the aquifer because most of the thickness consists of fine-grained lacustrine sediments. The zones of highest transmissivity (up to 4,000 ft^3/s) are where the saturated ice-contact, deltaic sand and gravel is thickest. This area is immediately east and west of N.H. Route 3 near well HTW-268 (pl. 4). The average saturated thickness of coarse-grained sand in this area ranged from 20 to 40 ft.

The Central Hooksett Water Precinct currently (1992) withdraws ground water from wells HTW-1 and HTW-2 on the eastern side of N.H. Route 3 and from well HTW-268 on the western side of N.H. Route 3. Wells HTW-2 and HTW-268 are close to Peters Brook, and pumping may induce flow from the brook into the aquifer. Base-flow measurements of Peters Brook in 1988 and 1989 indicate that ground-water discharge was about 0.8 ft^3/s or 550,000 gal/d (appendix D, site 3). Water withdrawn from well HTW-1 comes primarily from storage, because no surface-water sources are nearby. The average daily withdrawal from the three wells in 1989 was approximately 389,900 gal/d. The combined average daily withdrawal from the three wells was approximately 75,900 gal/d in January, February, and March 1990 and from HTW-1 was 18,200 gal/d in July 1990 (New Hampshire Water Management Bureau, written commun., 1990).

Brickyard Brook and Pinnacle Pond Aquifer

The Brickyard Brook and Pinnacle Pond aquifer is just west and south of Hooksett Village on the west side of the Merrimack River. A segmented esker, in place before the deposition of glacial-lake sediment, is traceable south of Pinnacle Pond and then again south and west of interchange 11 on Interstate 93 (pl. 4). The Brickyard Brook part of the aquifer was probably found in the waters of glacial Lake Hooksett, which was dammed by the Peters Brook delta. The elevation of the top of the Brickyard Brook delta is approximately 300 ft above sea level. Test borings at wells HTW-15 and HTW-17 (pl. 4) indicate coarse-grained ice-contact sand and gravel buried beneath the deltaic sands and associated lacustrine sediments (appendix B). Medium sand was found at about 186 ft above sea level in samples from well HTW-15, and coarse to very coarse sand was found at an altitude of 130 to 180 ft in well HTW-17 (appendix

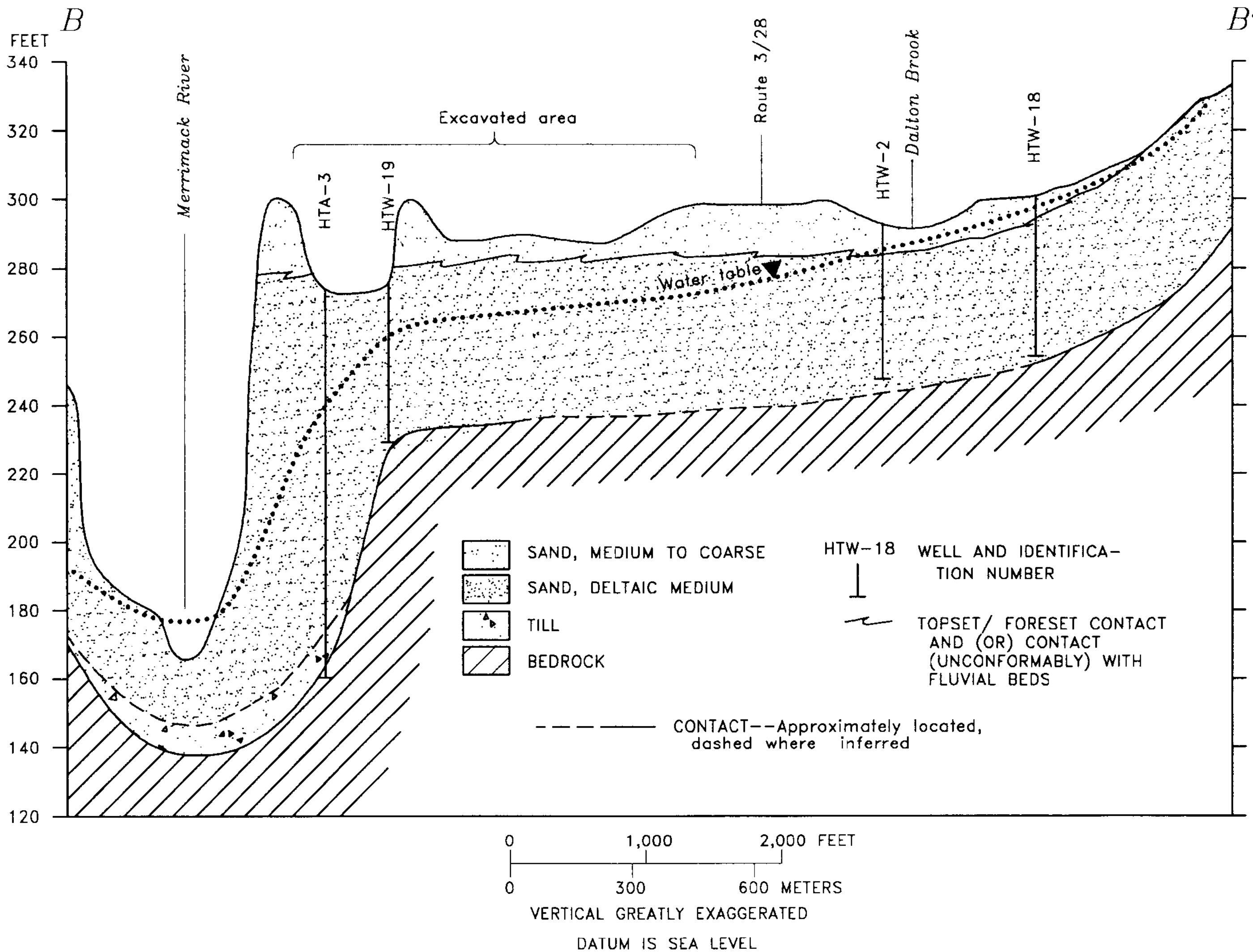


Figure 9.--Geologic section through the Peters Brook aquifer.

B). These data indicate the presence of a buried esker that may be hydraulically connected to the Merrimack River. The saturated thickness of the aquifer exceeds 62 ft at well HTW-15 and is 47 ft at well HTW-17. Further exploration is needed to determine if this deposit is a viable aquifer for water supply.

The Pinnacle Pond part of the aquifer (0.4 mi to the north) may also contain coarse-grained esker deposits; it is currently (1992) used by the Hooksett Village Water Precinct for water supply. In 1991, approximately 143,460 gal/d was withdrawn from well HTW-265 at the northern end of the pond. Approximately 95,438 gal/d was withdrawn from well HTW-10 at the southern end of the pond in 1990 (New Hampshire Water Management Bureau, written commun., 1991).

South Bow Aquifer

The South Bow aquifer is located along the northern boundary of the study area, which is adjacent to the Merrimack River in Bow and in part of Hooksett. Well BUW-8 (pl. 4) penetrated 50 ft of lacustrine very fine to medium sand overlying 18 ft of coarse-grained ice-contact sand and gravel (appendix B). The log of well BUW-9 (1,000 ft to the east) also showed that 20 ft of medium to very coarse ice-contact sand underlies lacustrine fine sand, which is underlain by 46 ft of very fine to medium sand. Aquifer transmissivity in this area ranges from 2,000 to 4,000 ft^2/d. These deposits are associated with a large delta that formed at the edge of glacial Lake Hooksett. Most of this delta deposit is outside of the study area.

Estimation of Yield for the Goffstown Aquifer

A two-dimensional ground-water-flow model was used to evaluate estimates of aquifer yield and to delineate drawdown due to ground-water withdrawal from a stratified-drift aquifer in Goffstown, N.H., west of the town center (pl. 3). The hydraulic characteristics of this aquifer are described in the section entitled "Description of Selected Aquifers," and a geologic section of the aquifer is shown in figure 8. The model is a numerical representation of the ground-water-flow system defined by a system of equations governing ground-water flow. The computer program used was developed by McDonald and Harbaugh (1988).

Conceptual and Numerical Model

In order to represent the ground-water-flow system in numerical form, one must describe the system by a conceptual model. Conceptualization of the system accounts for the processes involved in, and factors that influence, ground-water flow such as recharge, horizontal hydraulic conductivity of the aquifer, and stream-aquifer interaction. A conceptual model of the ground-water-flow system is shown in figure 10.

The saturated part of the stratified-drift aquifer consists of unconsolidated sand and gravel bounded by till and bedrock on the sides and bottom and by the water table on the top. Recharge to the stratified-drift aquifer is by infiltration of precipitation and lateral ground-water inflow from the upland till and (or) bedrock areas. The aquifer may also receive recharge from infiltration of stream water to the aquifer depending on the relative altitude of the water table and the stream surface.

The variability of aquifer properties and the difficulty of accurately measuring them results in a simplified representation of the stratified-drift aquifer. Several simplifying assumptions used to construct the model of the Goffstown aquifer are as follows:

1. **Two-dimensional horizontal flow is adequate to represent the flow system.** In the real system, ground-water flow is horizontal and vertical, but predominantly horizontal. Flow in the aquifer is always in response to a hydraulic gradient--a difference in hydraulic head divided by the distance between the heads. Vertical hydraulic gradients are generally downward in areas of ground-water recharge and upward in areas of ground-water discharge, such as to rivers. Strong vertical gradients also are present near discharging wells. The magnitude of vertical-flow gradients near a pumped well diminishes rapidly with distance from the well. The margin of error associated with simulating ground-water heads by considering only two-dimensional horizontal flow in the aquifer is small except in the area near the pumped wells.

2. **Ground water is withdrawn from wells that are fully penetrating and 100 percent efficient.** Wells used for supply are generally not fully penetrating but are commonly screened in the bottom 25 percent of the

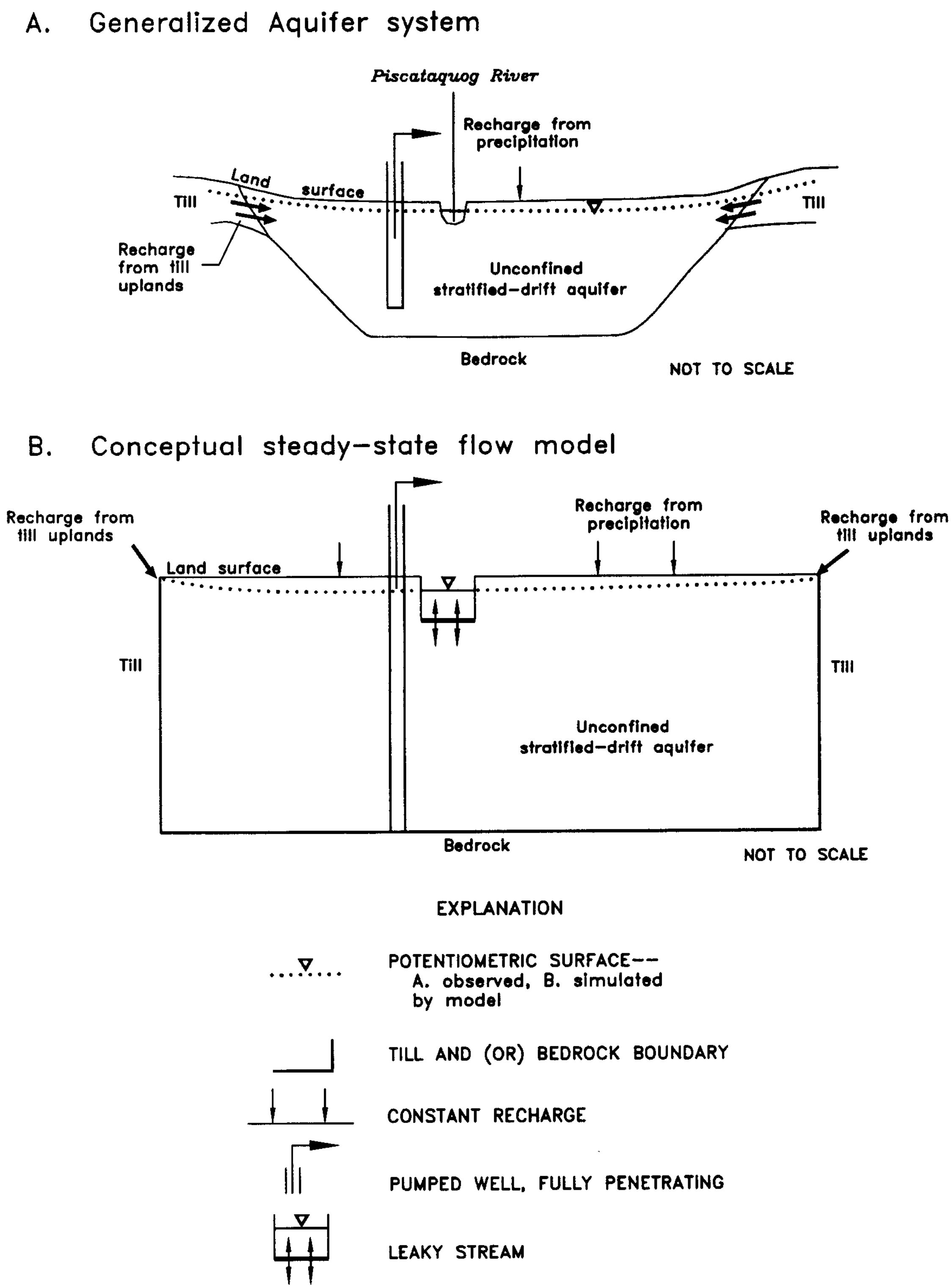


Figure 10.--Generalized aquifer system and conceptual model of steady-state ground-water flow in the Goffstown aquifer, Goffstown, New Hampshire.

aquifer. In addition, these wells are not 100 percent efficient. Increased drawdown in the well results from energy loss between the aquifer and the well, which is a function of well design and construction. The net effect of applying the simplifying assumptions related to fully penetrating wells to well efficiency is that slightly less drawdown is simulated than would occur in the natural system.

3. **There is no flow of ground water between till and (or) bedrock and stratified drift.** The model area is a valley-fill, stratified-drift aquifer that occupies a till-covered bedrock valley. In an aquifer where horizontal and vertical gradients are found in stratified drift and the till and (or) bedrock below, groundwater may flow between the aquifer and the surrounding geologic units. Measurements of aquifer discharge reflect the amount of water assumed to be recharging the aquifer from natural recharge and do not indicate that any additional water is flowing into or out of the aquifer from the bedrock. Because of this observation and the lack of vertical-gradient data, it was assumed that ground water did not flow between the stratified-drift and till and (or) bedrock boundary. Lateral inflow from till uplands adjacent to the edge of the stratified drift was simulated and applied to the edge cells of the model, as discussed in the section "Selection of Input Parameters."

4. **Finite-difference approximation of the nonlinear, partial differential equations governing two-dimensional flow result in reasonable values of head at any given site within the aquifer.** Flow in the conceptual model is described by differential equations that are solved numerically by use of a finite-difference approximation. The aquifer is discretized in space or divided into discrete blocks (cells) and hydraulic properties are assumed to be constant within each cell. For unconfined systems, the linear equations are not strictly applicable because changes in the potentiometric surface affect the transmissivity, and changes in the transmissivity with time result in nonlinear aquifer response. Because the changes in transmissivity are small throughout most of the aquifer, inaccuracies that result from this approximation are minimal. Exact solutions to the linear equations are impossible; therefore, the solutions are determined by solving the series of linear equations, through the process of iteration, until the greatest change in the solution (greatest change in the head) is less than some stated limit. A limit of 0.01 ft was used to end the iteration process.

   The analysis was performed in steady-state which was sufficient for the purposes of this yield estimate. Transient analyses were beyond the scope of this model and might be appropriate for management purposes.

Model grid

The model grid for the Goffstown aquifer is composed of 45 rows and 75 columns. This grid is superimposed on the long axis of the Piscataquog River valley. A variable-size grid was used in this model whereby the cell dimensions ranged from 200 ft by 200 ft (over most of the model) to 50 ft by 50 ft in areas where wells were to be simulated because of the high density of the data in these areas.

Boundary conditions

The Goffstown aquifer is bounded by till-covered bedrock valley walls on the north and south sides and by till and (or) constrictions in the valley where the Piscataquog River and South Branch Piscataquog River flow into the aquifer system on the western boundary at Goffstown center (pl. 3, fig. 7). In the numerical model, these physical features that limit the aquifer are represented by constant-flux boundaries and account for the small amounts of inflow into the stratified-drift aquifer from adjacent till-covered uplands.

Rivers and streams within the model are simulated as head-dependent flux boundaries. A head-dependent flux boundary specifies the amount of water allowed to move from the river into the aquifer or from the aquifer into the river as dependent on the head in the river and the head in the aquifer for any given model cell (Franke and others, 1987). Water can flow either into the stream from the aquifer or from the stream into the aquifer depending on the hydraulic gradient between the stream and aquifer. Stream widths, lengths, and stages were obtained from 1:24,000-scale topographic maps and from field measurements. Streambed thickness was estimated to average 2 ft based on measurements made near the well field and streambed hydraulic conductivity was estimated to be 3 ft^3/s by grain-size analysis of sediment cores collected at selected locations along the stream. The water table is simulated as a free-surface boundary and is free to move up and down in response to changes in head at any given cell (Franke and others, 1987).

Selection of input parameters

Input parameters consist of (1) position of the potentiometric surface, (2) gains in streamflow, (3) recharge to the aquifer, (4) hydraulic conductivity of the aquifer, and (5) aquifer saturated thickness. Input parameters for the numerical model were based on field measurements made between March 1988 and October 1989.

Annual water-table fluctuations were generally small (1-2 ft) near the center of the aquifer where the water-table gradient was low (0.2 percent) and somewhat greater (3-4 ft) toward the edge of the aquifer where the water-table gradient was steeper (2.0 percent). Water-table altitudes measured during September 1989 define the potentiometric surface used as initial heads in the model (table 3).

Streamflow measurements were made concurrently with water-table measurements to quantify stream-aquifer interaction. Flows were measured in all streams as they entered and left the model area and at points in between. Gains in streamflow over the 1.2-mi length of the model area ranged from 2.19 to 24.9 ft^3/s. No streamflow losses were measured for any of the reaches, although streamflow losses are likely in some reaches.

Recharge to the aquifer was based on measured stream gains during a period of low flow on September 6, 1989. These flows represented 93-percent flow duration on the basis of long-term records (1940-78) from a USGS streamflow-gaging station (01091000) on the South Branch Piscataquog River. (Use of low-flow measurements is a means of conservatively estimating recharge to the aquifer and is not representative of long-term average conditions.) The gain of 2.19 ft^3/s over the 1.2-mi^2 model area is equal to a recharge rate of 19.8 in/yr. This gain is approximately equal to the ±5-percent error associated with the measurements used to compute the value of 2.19 ft^3/s. The recharge rate of 19.8 in/yr is approximately one-half of the average-annual precipitation recorded in this area (National Oceanic and Atmospheric Administration, 1987).

Lateral recharge is ground-water recharge from upland till and (or) bedrock that does not discharge to a stream before it flows into the aquifer. This ground water effectively recharges the edges of the modeled aquifer. Lateral inflow to the aquifer at the stratified-drift and till and (or) bedrock boundary was estimated by measuring ground-water discharge to several small tributaries that drain till-covered bedrock uplands. The flow values were divided by the drainage areas to estimate the ground-water discharge per square mile of upland drainage basin. Ground-water discharge ranged from 0.065 to 0.27 $(ft^3/s)/mi^2$. The average discharge of 0.09 $(ft^3/s)/mi^2$ was used in the model. This is relatively consistent with the average discharge of 0.205 $(ft^3/s)/mi^2$ used by Harte and Mack (1992).

The estimated horizontal hydraulic conductivity of the aquifer ranged from 3 to 150 ft/d. The lowest hydraulic conductivity is near the edges of the aquifer at the stratified drift and till and (or) bedrock contact. The highest hydraulic conductivity, at the center of the stratified-drift aquifer, reflects the presence of coarse-grained kame and delta deposits. These hydraulic conductivities were largely estimated from relations between hydraulic conductivity and grain size distribution of aquifer sediments that are described in the section of the report on "Transmissivity and Hydraulic Conductivity." Hydraulic conductivity in the coarse-grained deposits was estimated from results of a 3-day aquifer test done by the USGS at a well (GNW-1, pl. 3) owned by the Goffstown Water Precinct.

Saturated thickness was determined from test drilling and from extensive seismic-refraction profiling over most of the model area (pl. 3). The saturated thickness averages 30-40 ft and exceeds 60 ft locally.

Calibration of steady-state model

Model calibration is the process of adjusting input parameters until model-computed heads closely agree with observed heads (water levels). In the model, wells used to simulate actual observation wells represented the average head for the entire cell. Water levels observed in 10 wells during late August and early September 1989 were used as the reference heads in calibrating the model. Streamflow into and out of the aquifer was measured simultaneously during a period of 93-percent flow duration.

Aquifer horizontal hydraulic conductivities, streambed conductances, and river stage were varied in model zones, based on reasonable ranges of uncertainty, around values of aquifer characteristics observed in the field. The process was continued until the absolute difference between observed head and computed head at each of the 10 observation wells was less than 3 ft. The absolute differences between observed and computed heads in the calibrated model ranged from 0.11 to 2.95 ft, and the average absolute difference was 0.37 ft (table 3). The recharge to the model area from precipitation and from lateral seepage from till uplands was not varied during calibration because recharge values reflected streamflow measurements made during periods of base flow. Ground-water discharge from the aquifer to the stream was equal to the amount of recharge applied to the model and was set at 2.19 ft^3/s, the discharge measured during base flow.

The steady-state water-table configuration computed by the model is shown in figure 11. This head distribution was adopted as the starting-head array in the model simulations used to estimate the yield of the Goffstown aquifer. The steady-state water budget computed by the model is shown in table 4.

Sensitivity analysis of nonstressed steady-state model

Sensitivity analysis shows the effect of variations in parameters on model results. The analysis indicates which parameters have the most effect on ground-water-flow simulations and where future data-collection efforts can be concentrated.

Principal input parameters (recharge, streambed conductance, and horizontal hydraulic conductivity) were increased and decreased independently throughout the model to observe the effect on computed water levels. Input parameters were varied over a reasonable range of values that reflects the uncertainty of correctly estimating them. Observed heads minus the computed heads were analyzed statistically, and the results are shown in figure 12 as a series of boxplots.

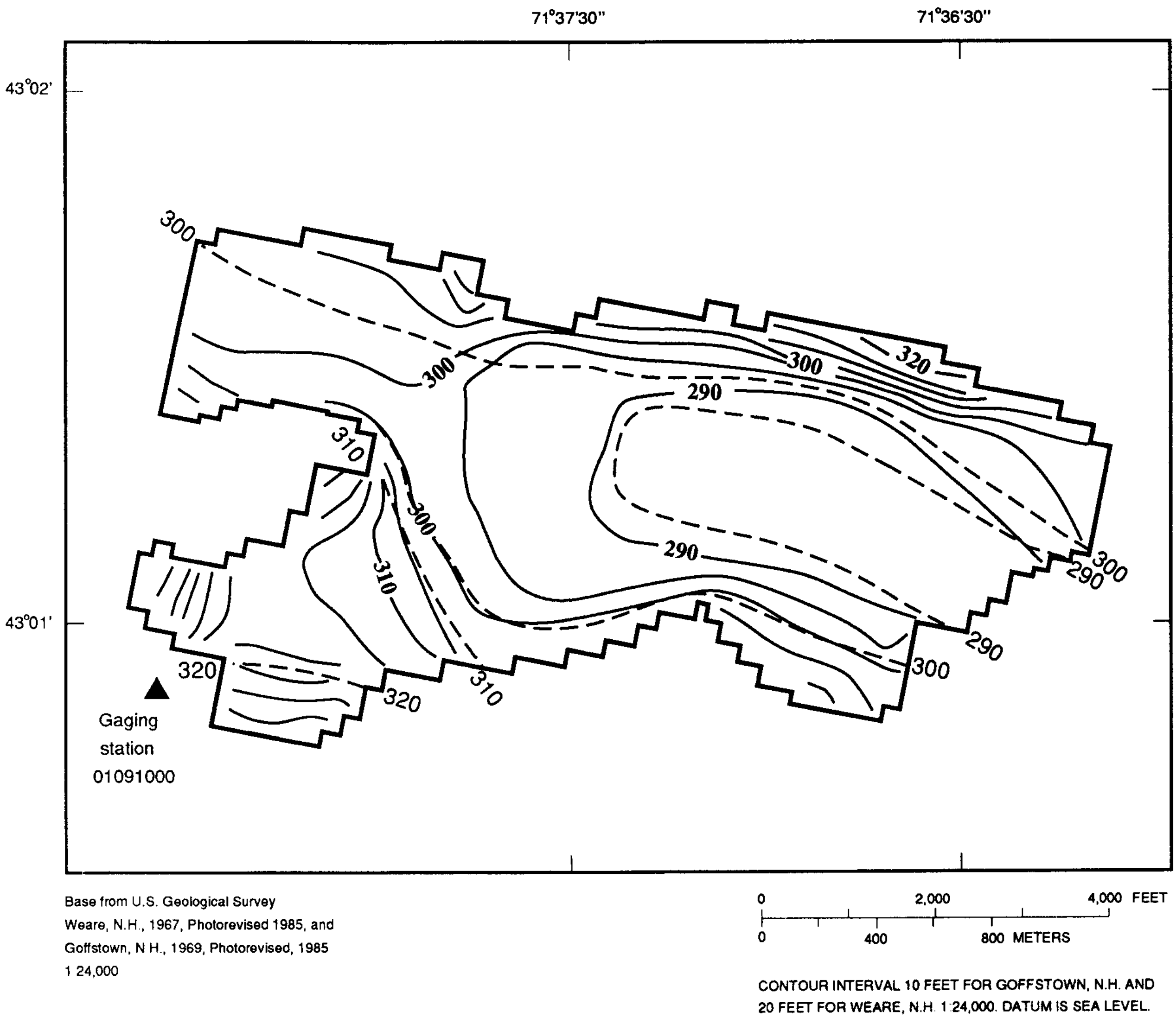
The boxplots show the interquartile range (IQR), which is the range of the central 50 percent of data as well as the position of extreme values. A comparison of boxplot 1 (calibrated heads) with boxplot

Table 3.--*Differences between observed and computed heads in the calibrated steady-state model for the Goffstown aquifer*

[ft, feet]

Well location in model row, column	Local well number (plate 3)[1]	Observed water level (ft)	Computed water level (ft)	Observed minus computed (ft)
04,07	GNW-17	299.80	302.75	-2.95
14,43	GNW-1	285.50	286.20	-.70
15,47	GNW-7	285.60	286.05	-.45
16,45	GNW-4	285.60	286.01	-.41
18,41	GNW-9	285.50	285.91	-.41
20,35	GNW-8	285.80	285.69	.11
20,45	GNW-2	285.40	285.73	-.33
26,20	GNW-14	295.00	292.25	2.75
27,52	GNW-15	286.00	286.11	-.11
31,31	GNW-16	289.10	290.25	-1.15

[1] Wells are shown on plate 3.



EXPLANATION

(boundary symbol)	MODEL BOUNDARY
—— 290 ——	SIMULATED POTENTIOMETRIC SURFACE CONTOUR--Shows simulated altitude of water table under steady-state conditions. Contour interval 5 feet.
290 — — — —290	INTERPRETED POTENTIOMETRIC CONTOUR--Contour interval 10 feet. National Geodetic Vertical Datum 1929.

Figure 11.--Water-table configuration for the simulation of the Goffstown aquifer.

Table 4.--*Model-calculated steady-state water budget for the Goffstown aquifer*

[ft^3/s, cubic feet per second]

Sources of water	Inflow (ft^3/s)	Outflow (ft^3/s)
Natural recharge;		
Precipitation	2.2	0
Lateral recharge from till and (or) uplands	.2	0
River leakage	1.8	4.2
Total	4.2	4.2

5 (hydraulic conductivity x 0.6) indicates that reasonable decreases in the hydraulic conductivity tend to elevate the overall potentiometric surface and produce more variation in the water levels (fig. 12). The greatest variations are on the edges of the model, where the water-table gradient is the steepest. In addition, a comparison of boxplot 1 with boxplot 3 (recharge times 1.5) indicates that heads increase proportionally and vary over a wider range by increasing the amount of recharge to the model. Nonstressed model results are shown to be less sensitive to changes in streambed conductance (boxplots 4 and 5) than to changes in other parameters.

Estimate of aquifer yield

Aquifer yield was estimated by simulation of the total ground-water withdrawal that could be simultaneously pumped from a series of wells distributed throughout the aquifer. The amount of water discharged from a given well was limited by hydrologic constraints discussed in the following paragraph. The total aquifer yield was the sum of the withdrawals from the individual wells. Hypothetical withdrawal wells, located on town-owned and undeveloped and (or) agricultural land, were restricted to zones of high transmissivity.

Natural recharge and induced infiltration from streams are the two main sources of water to the hypothetical wells. The total water available from natural recharge was 2.4 ft^3/s (table 4). Water available to the wells from the stream was limited by a conservative withdrawal scheme to maintain a minimum streamflow. The minimum-streamflow scheme is only one of many possible withdrawal schemes and was used only as an example. This scheme allows the streamflow that is equaled or exceeded 99 percent of the time (99-percent-flow duration) to flow in the stream and uses the streamflow that is equalled or exceeded 95 percent of the time (95-percent-flow duration) minus the flow that is equalled or exceeded 99 percent of the time. For the Goffstown aquifer, the 95-percent-flow duration minus the 99-percent-duration flow is equal to 6.4 ft^3/s for all streams flowing into the aquifer.

The total water potentially available to wells is equal to the total natural recharge (2.4 ft^3/s) and the available streamflow (6.4 ft^3/s) or 8.8 ft^3/s, which seems high for the approximately 1.2-mi^2 aquifer. The available streamflow is probably high because the aquifer is at the confluence of two major river drainages entering the area from the west and north.

For each hypothetical well in the aquifer, simulated drawdown produced by pumping was limited to 50 percent of the saturated thickness at the well. For a given cell containing a well, the final computed head is the average for the entire cell; the head in the well is less than this average value. The actual drawdown in the cell was calculated by a method described by Trescott and others (1976).

Ground-water-withdrawal wells were simulated at four locations that met the previously discussed well-location criteria. Steady-state simulations were run to determine the rate that water could be pumped simultaneously from all four wells without reducing the saturated thickness by more than 50 percent at any well and without inducing infiltration of more than 6.4 ft^3/s of streamflow. The four wells yielded 0.8 ft^3/s (0.52 Mgal/d), 1.1 ft^3/s (0.71 Mgal/d), 0.9 ft^3/s

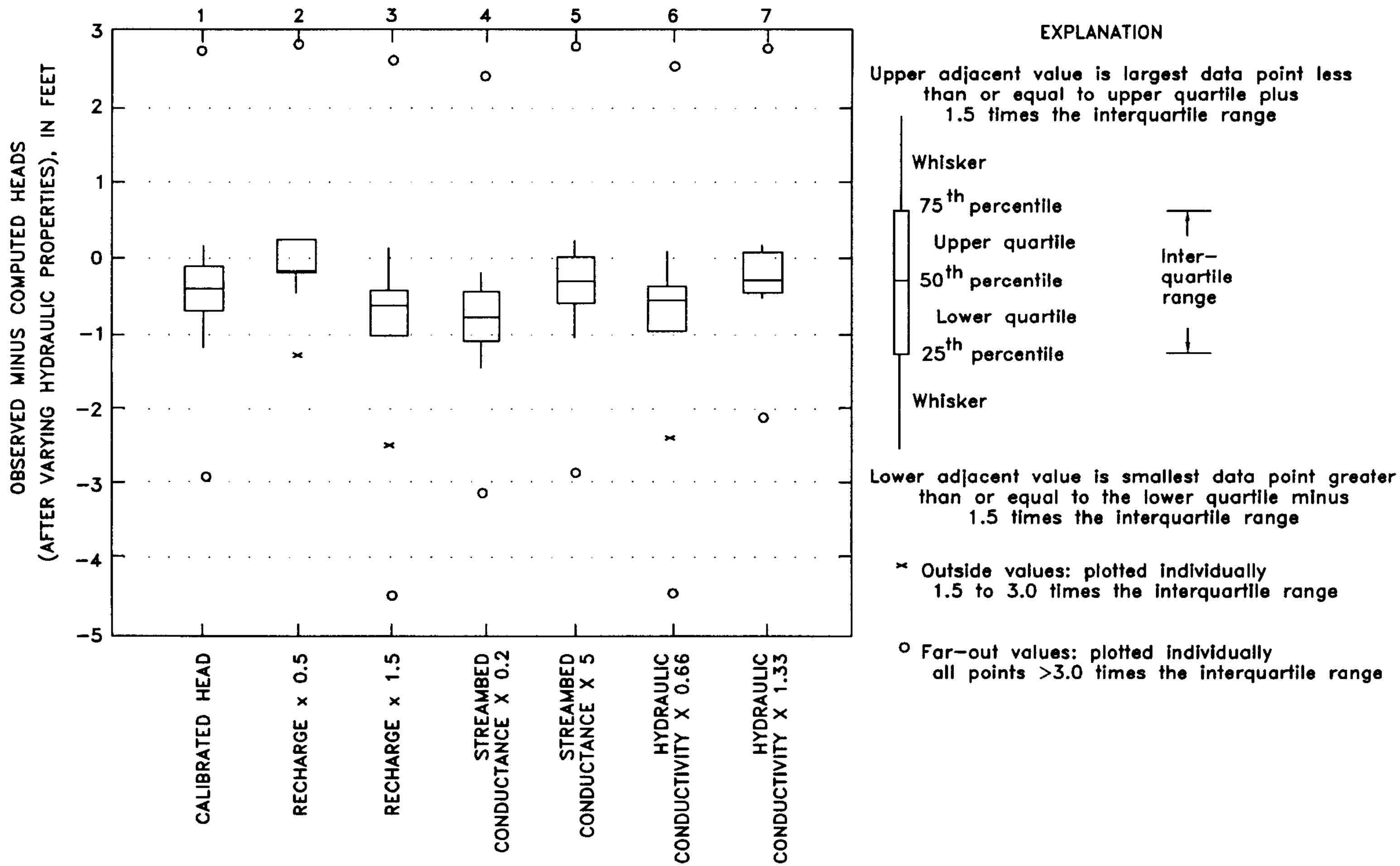


Figure 12.--The statistical distribution of the difference between observed and computed heads for sensitivity tests of the nonstressed steady-state flow model.

(0.58 Mgal/d), and 1.1 ft^3/s (0.71 Mgal/d) for a total of 3.9 ft^3/s (2.5 Mgal/d). Lines of equal drawdown for this simulation are shown in figure 13.

The estimated yield of the Goffstown aquifer was not limited by the water available for induced infiltration but by the limit for drawdown of 50 percent of the saturated thickness and by the number of hypothetical wells in the model. Additional wells would likely increase the yield. By adding more wells in different locations or in different configurations, additional streamflow could possibly be induced to infiltrate the aquifer. The simulation results in this report are considered to be conservative and only one of several options that can be used for estimating aquifer yield. The final steady-state potentiometric surface under the yield-estimate simulation during pumping is shown in figure 14. The final water budget for the yield estimate is shown in table 5.

The estimated aquifer yield is 3.9 ft^3/s; 1.5 ft^3/s is from induced recharge from the river and 2.4 ft^3/s is from natural recharge (table 5). Water captured by the wells (aquifer yield) is equal to the decrease in ground-water discharge plus the increase in recharge (Lohman and others, 1972, p. 3).

Sensitivity analysis of stressed steady-state model

A second sensitivity analysis was done to the Goffstown model to test the effects of the yield estimate to changes in input parameters. The ranges in parameter values tested were similar to those used in the steady-state calibrated nonstressed model. The results of the analysis of each change in input value are shown in figure 15.

Heads at the 10 observation wells (table 3) were compared for each simulation in the steady-state stressed sensitivity analysis. The results are summarized in figure 15. The data from which the boxplots were constructed represent the difference between the heads computed for the final yield-estimate simulation and the heads computed for each change in the input-parameter values. Three parameters--recharge, streambed conductance, and horizontal hydraulic conductivity--were varied over the same range as in the sensitivity analysis of the steady-state nonstressed model. Large reductions in streambed conductance appear to have a small but noticeable effect on the magnitude of the head differences (boxplot 3, fig. 15) and reduced recharge produces lower heads than were expected. Variations of horizontal hydraulic conductivity cause noticeable changes in the magnitude of the head differences; for example, when horizontal hydraulic conductivity is decreased, the magnitude of the heads increases.

The changes in input-parameter values also affected the estimated aquifer yields. The parameter changes and resulting changes in estimated yield are shown in table 6. The changes in recharge and streambed-conductance values have little effect on the total yield of the aquifer compared to changes in the horizontal hydraulic conductivity (table 6).

Changes in the horizontal hydraulic conductivity have the largest effect on estimated yield. For example, a 33-percent decrease in horizontal hydraulic conductivity results in a 36-percent decrease in the yield. Similarly, a 33-percent increase in horizontal hydraulic conductivity causes a 22-percent increase in yield.

Varying the input parameters also changes the percentage of water coming from each source. As recharge is decreased, more water must come from the stream to produce the same yield. As the streambed conductance is decreased, flows between the stream and aquifer decrease, whereas the total estimated yield drops only to 3.7 ft^3/s.

This sensitivity analysis indicates that, within the selected ranges of parameter values, uncertainty in the values of horizontal hydraulic conductivity assigned in the model causes the greatest range of estimated aquifer yields. Future data-collection to refine the distribution of horizontal hydraulic conductivity could substantially improve the model-derived estimates of aquifer yield. The effect on aquifer yield of streambed conductance, a parameter for which there is little field data, is highly variable throughout the model and not well defined. Additional streambed-conductance data, in combination with base-flow measurements of streams, would increase confidence in the model-derived water budget and the sources of water to pumped wells.

Appraisal of Yield Estimate

The estimate of aquifer yield and its sensitivity to changes in the values of selected input parameters for one particular withdrawal scheme is summarized in tables 5 and 6. Several other alternative withdrawal plans were not considered. For example, the estimated yield of 3.9 ft^3/s (2.5 Mgal/d) was shown to be constrained by limiting drawdown to 50 percent of the saturated thickness. The number and location of wells simulated in the model may also affect yield.

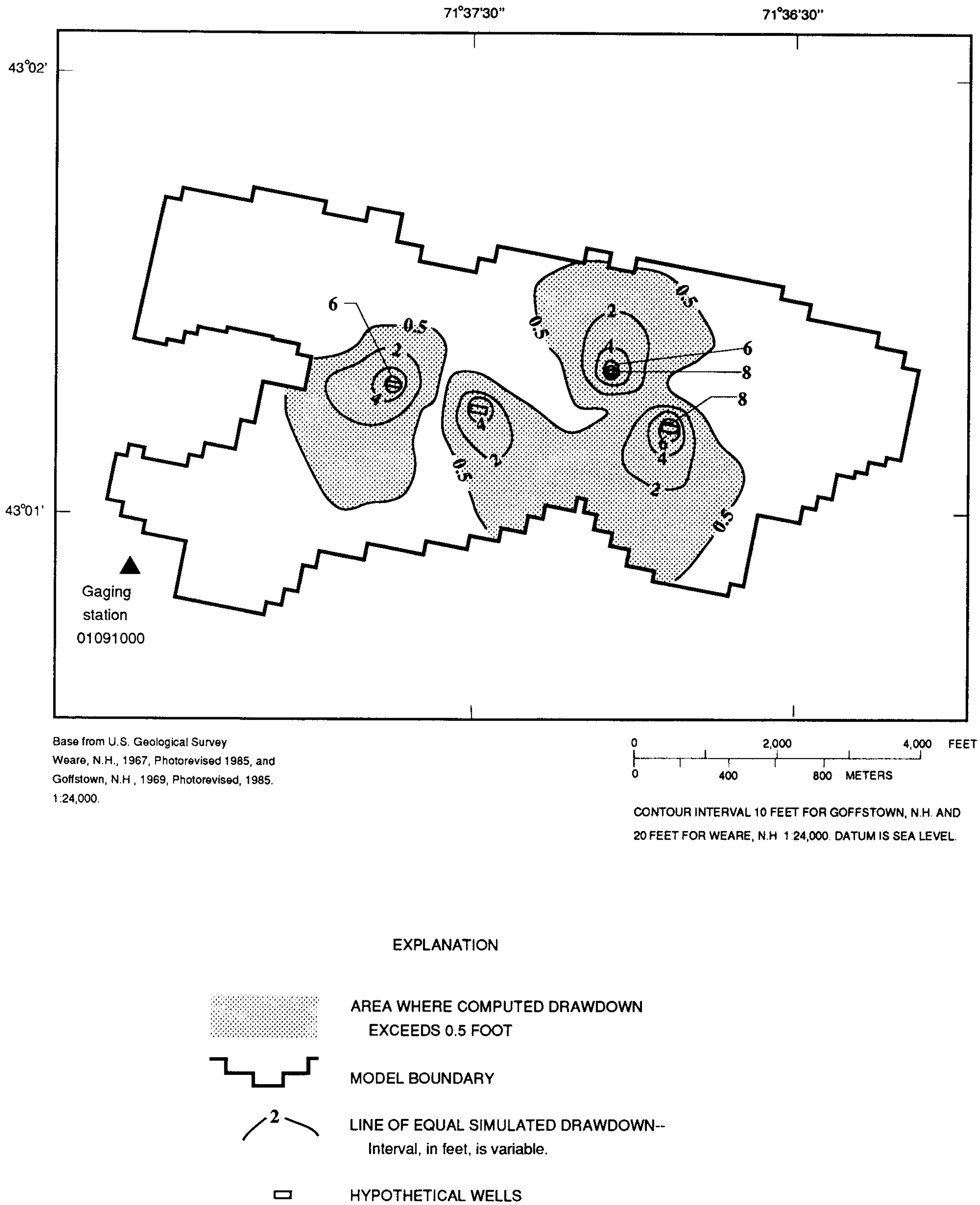
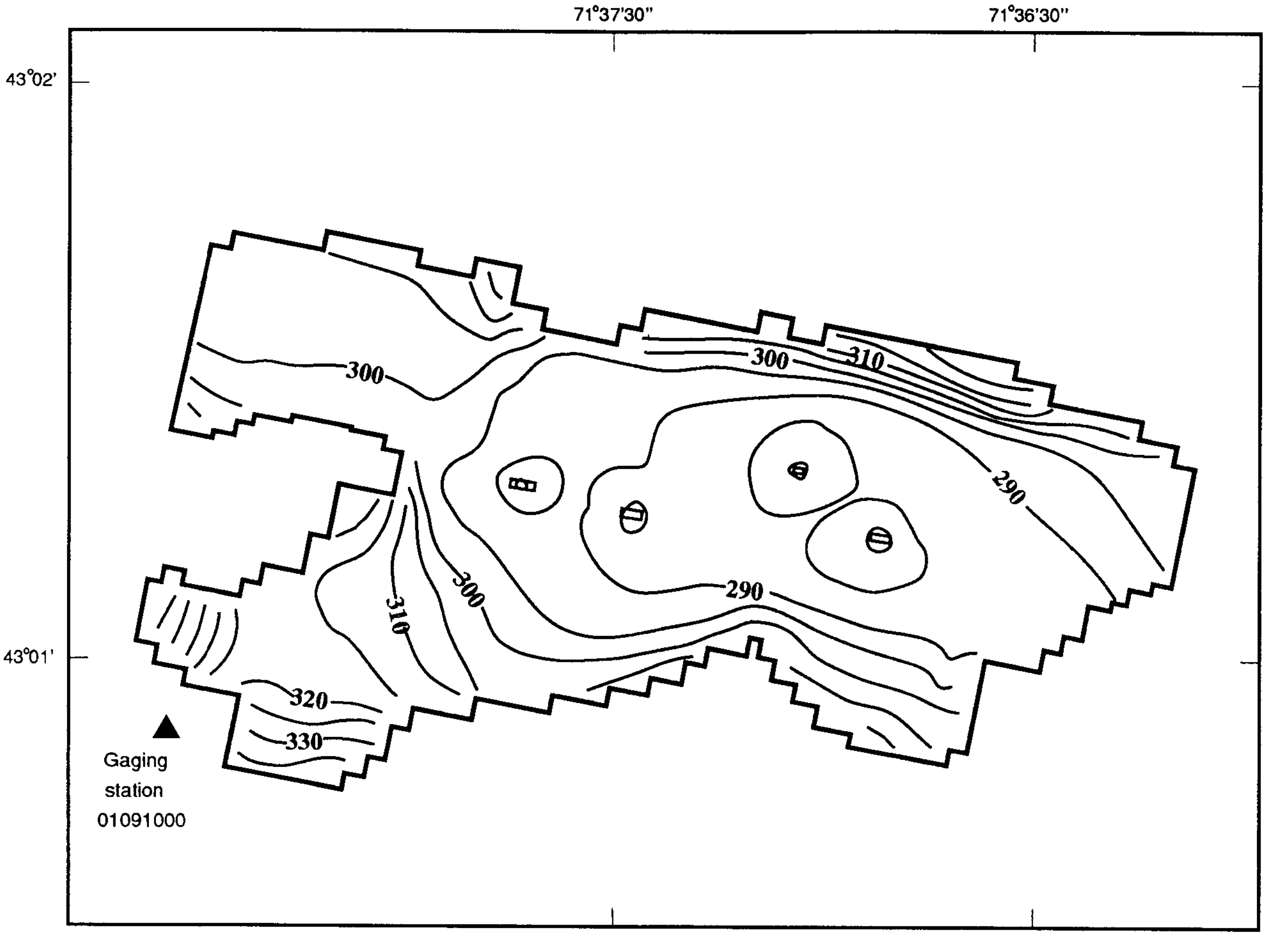


Figure 13.--Simulated drawdown near four hypothetical wells in the Goffstown aquifer.



Base from U.S. Geological Survey
Weare, N.H., 1967, Photorevised 1985, and
Goffstown, N.H., 1969, Photorevised, 1985
1:24,000.

0 2,000 4,000 FEET
0 400 800 METERS

CONTOUR INTERVAL 10 FEET FOR GOFFSTOWN, N.H AND
20 FEET FOR WEARE, N.H. 1:24,000. DATUM IS SEA LEVEL

EXPLANATION

MODEL BOUNDARY

290 — POTENTIOMETRIC SURFACE CONTOUR--Shows simulated altitude of water table during pumping of hypothetical wells. Contour interval 5 feet. National Geodetic Vertical Datum of 1929.

HYPOTHETICAL WELLS

Figure 14.--Steady-state water-table configuration, during pumping, for the Goffstown aquifer.

Table 5.--*Model-calculated steady-state water budget for the yield estimate with simulated withdrawal of 3.9 cubic feet per second*

[ft^3/s, cubic feet per second]

Source of water	Inflow (ft^3/s)	Outflow (ft^3/s)
Natural recharge:	2.2	0
Lateral recharge from till and (or) bedrock uplands	.2	0
River leakage		
captured by wells	1.5	0
not captured by wells	2.5	2.5
Wells	0	3.9
Total	6.4	6.4

Sensitivity analysis of the model indicates that the estimates of yield can range from 2.5 to 5.0 ft^3/s (1.6 to 3.2 Mgal/d) primarily because of uncertainty in the horizontal hydraulic conductivities used in the model. Whereas changes in the input data for recharge and streambed conductance do not significantly affect the yield, changes in these parameters could affect not only the percentage of water that comes from each source but also the total water budget. If recharge from precipitation is decreased, additional water to sustain withdrawals could come from decreases in ground-water discharge to streams and from induced infiltration from streams. As streambed conductance was decreased, the total flow between the stream and aquifer decreased, but enough water was induced into the aquifer to sustain the estimated yield.

Only 3.9 ft^3/s of the 8.8 ft^3/s can be withdrawn under the modeled conditions. Other withdrawal schemes may allow for more or less water to be withdrawn. This model considered only two sources of water available to wells: (1) areal and lateral recharge and (2) intercepted and induced ground-water discharge (streamflow). Additional yield from aquifer storage may be available to wells over short periods of time (high-demand times) with the assumption that the water will be replaced during times of low demand and (or) times of greater than average recharge to the aquifer (such as periods of high rainfall).

WATER QUALITY

Water samples from 10 wells were collected, from June to November 1988, and analyzed for inorganic and organic compounds. The results were used to evaluate the background water quality of the stratified-drift aquifers in the middle Merrimack River basin area. During the sampling phase of this study, areas where ground water was known to be contaminated (CERCLA sites) were avoided.

The choice of sampling procedure depended on the source of the water sampled. All the sampled wells were developed either with compressed air or with a centrifugal pump to remove water introduced during drilling, foreign material, and sediment and to improve the hydraulic connection with the aquifer. Wells were allowed to stabilize for at least 1 month before sampling. Just before sampling, the wells were pumped until temperature and specific conductance stabilized and at least three times the volume of water in the well was evacuated. This procedure helped ensure that the sampled water represented water from within the aquifer.

Results of the chemical analyses are presented and compared with the USEPA (1992) primary and secondary drinking-water regulations and the New Hampshire Department of Environmental Services, Water Supply Engineering Bureau drinking-water recommendations (New Hampshire Department of Environmental Services, Water Supply Engineering

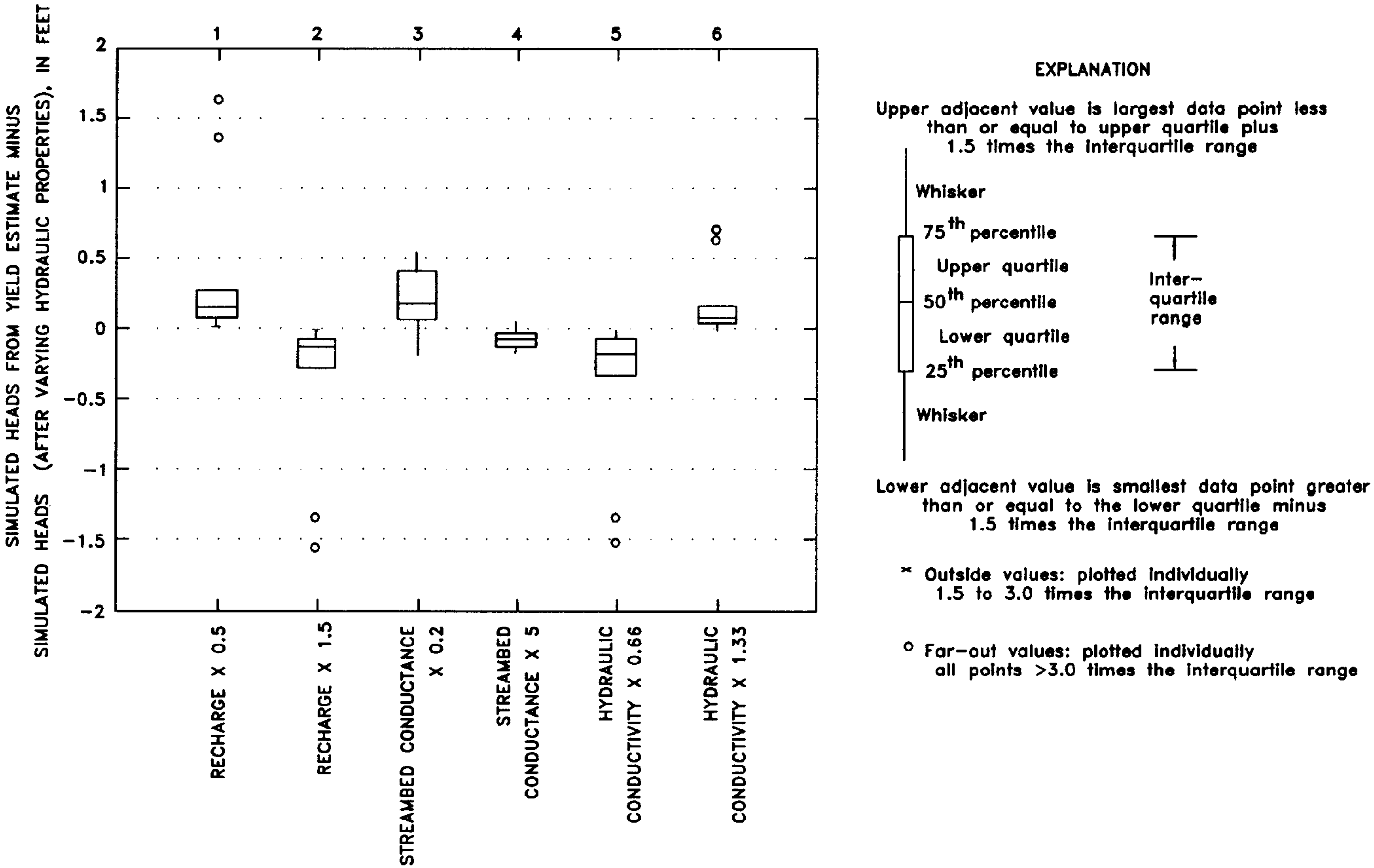


Figure 15.--The statistical distribution of differences between simulated heads during pumping and simulated heads during pumping after varying hydraulic properties in the model.

Table 6.--*Changes in the model-calculated yield estimate resulting from variation of hydraulic properties*

[Individual and total well yields in cubic feet per second]

Model run	Yield of hypothetical well				
	1	2	3	4	Total
Calibrated model	0.8	1.1	0.9	1.1	3.9
Recharge × 0.5	.8	1.0	.9	1.1	3.8
Recharge × 1.5	.8	1.1	1.0	1.1	4.0
Streambed conductance × 0.2	.8	1.0	.9	1.0	3.7
Streambed conductance × 5.0	.8	1.1	1.0	1.1	4.0
Hydraulic conductivity × 0.66	.5	.7	.6	.7	2.5
Hydraulic conductivity × 1.33	1.0	1.4	1.2	1.4	5.0

Bureau, written commun., 1990) in table 7. Naturally occurring constituents that have no recommended limits, but whose concentrations are generally less than a few micrograms per liter, also are included in table 7. Many of the constituents listed in table 7 were not detectable in water samples from the stratified-drift aquifers in the study area.

Results of the sample analyses indicate that water from the stratified-drift aquifers is generally suitable for drinking and other domestic uses. Water from two wells (GSW-101 and WGW-19) had sodium concentrations that exceeded 20 mg/L (milligrams per liter), water from two wells (FCW-3 and WGW-19) had concentrations of dissolved iron that exceeded 300 μg/L (micrograms per liter), and water from eight wells (FCW-3, GNW-14, GSW-101, NCW-8, NJW-1, NJW-4, NJW-5, WGW-19) had concentrations of manganese greater than 50 μg/L. Individual constituents and properties are discussed in the following paragraphs.

Specific conductance--a measure of the ability of water to conduct electrical current--ranged from 53 μS/cm (microsiemens per centimeter at 25 degrees Celsius) in water from well NJW-1 to 410 μS/cm in water from well WGW-19. The median (84 μS/cm) for all water samples was less than the median (132 μS/cm) of the entire State for public supply wells completed in stratified-drift aquifers (Morrissey and Regan, 1987).

Total dissolved-solids (solids residue, table 7) concentrations in water include all ionized and unionized dissolved solids in solution. The total dissolved-solids concentrations of all water samples from stratified-drift aquifers ranged from 39 (well NJW-1) to 216 mg/L (well WGW-19) and were less than the maximum recommended limit for drinking water of 500 mg/L established by the New Hampshire Water Supply Engineering Bureau (1990). The low concentration of dissolved solids in these stratified-drift aquifers can be attributed to the low solubility of the aquifer matrix and the relatively short time that the water is in contact with the aquifer (Morrissey and Regan, 1987).

Sodium (Na) and chloride (Cl) can be introduced into ground water from nonindigenous sources (wet or dry deposition such as sea salt and aerosols) and anthropogenic sources. The major anthropogenic source of both sodium and chloride is NaCl used in road salting. On the basis of limited data, it is estimated that New Hampshire towns and cities used about 33,000 tons per year of NaCl for deicing roads, (Hall, 1975). The highest concentra-

Table 7.-- *Chemical analyses of ground-water samples*

[ft, feet; μS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; mg/L, milligrams per liter; μg/L, micrograms per liter; <, less than; --, no data]

Local well number	Date of sample location	Water level in depth below land surface (ft)	Depth of well, total (ft)	Depth to top of sample interval (ft)	Specific conductance, field (μS/cm)	pH, field (standard units)	Temperature of water (°C)	Oxygen, dissolved (mg/L as O_2)	Hardness (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Alkalinity, lab (mg/L $CaCO_3$)
FCW-3	11-08-88	11.9	20	17.5	65	6.8	10.5	--	15	4.1	1.2	5.0	1.8	22
GNW-1	06-10-88	--	40	30.0	106	5.9	8.5	4.4	18	5.5	.91	13	1.4	10
GNW-14	11-08-88	.61	55	50.0	92	6.0	9.0	4.9	26	8.6	1.2	6.8	.90	14
GSW-101	11-08-88	6.13	35	32.5	280	5.6	9.0	1.6	15	4.8	.62	32	1.3	9.0
MGW-1	11-07-88	5.91	32	30.0	71	6.2	9.5	8.9	14	4.5	.74	7.4	2.2	13
NCW-8	11-08-88	22.93	50	48.0	75	6.3	8.7	1.4	25	7.7	1.5	4.6	2.0	25
NJW-1	11-07-88	7.01	55	52.5	53	6.7	9.1	2.2	13	4.0	.65	4.1	1.7	15
NJW-4	11-07-88	7.45	40	37.5	110	5.8	9.6	3.6	14	4.4	.76	16	1.4	11
NJW-5	11-07-88	14.26	35	32.5	69	6.5	9.1	--	20	4.2	2.4	4.8	2.0	16
WGW-19	11-08-88	4.46	30	27.5	410	5.4	9.8	.7	16	5.1	.87	75	1.6	10
U.S. Environmental Protection Agency drinking-water regulations for listed property or chemical constituent														
SMCL[1]	--	--	--	--	--	--	--	--	--	--	--	[4]20 - 250	--	--
MCL[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 7.-- *Chemical analyses of ground-water samples--Continued*

Local well number	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 180 °C, dissolved (mg/L)	Sulfate, dissolved (mg/L as SO_4)	Nitrogen, nitrate, dissolved (mg/L as N)	Nitrogen, $NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia, dissolved (mg/L as N)	Phosphorus, dissolved (mg/L as P)	Aluminum, dissolved (μg/L as Al)	Arsenic, dissolved (μg/L as As)	Barium, dissolved (μg/L as Ba)	Beryllium, dissolved (μg/L as Be)	Boron, dissolved (μg/L as B)
FCW-3	3.4	0.1	13	44	12	[3]<0.09	<0.10	0.02	0.01	<10	3	5	<0.5	<10
GNW-1	20	.3	10	63	7.0	[3]<.50	.51	.01	<.01	20	<1	10	<.5	<10
GNW-14	12	.1	14	59	5.1	1.09	1.10	<.01	.01	10	<1	8	1	<10
GSW-101	46	<.1	8.3	101	9.4	.67	.69	<.01	.01	40	<1	29	1	<10
MGW-1	8.8	<.1	11	47	4.6	.94	.96	<.01	.01	<10	<1	3	2	<10
NCW-8	6.1	.1	21	58	5.4	[3]<.09	<.10	.02	<.01	<10	3	5	<.5	<10
NJW-1	1.5	.1	15	39	8.8	[3]<.13	.14	.02	.03	<10	6	<2	1	<10
NJW-4	20	<.1	12	63	8.1	[3]<.22	.23	.01	<.01	<10	<1	8	<.5	<10
NJW-5	2.1	<.1	19	43	14	.15	.16	.03	<.01	<10	1	8	<.5	<10
WGW-19	120	.1	9.4	216	8.0	[3]<.09	<.10	.04	<.01	90	1	74	<.5	<10
U.S. Environmental Protection Agency drinking-water regulations for listed property or chemical constituent														
SMCL[1]	[4]250	[4]2.0	--	[4]500	[4]250	--	--	--	--	50-200	--	--	--	--
MCL[2]	250	4.0	--	500	--	10	10	--	--	--	50	2,000	4	--

Table 7.-- *Chemical analyses of ground-water samples*--Continued

Local well number	Cadmium, dis-solved (μg/L as Cd)	Cobalt, dis-solved (μg/L as Co)	Copper, dis-solved (μg/L as Cu)	Iron, dis-solved (μg/L as Fe)	Lead, dis-solved (μg/L as Pb)	Lithium, dis-solved (μg/L as Li)	Manga-nese, dis-solved (μg/L as Mn)	Mercury, dis-solved (μg/L as Hg)	Molyb-denum, dis-solved (μg/L as Mo)	Nickel, dis-solved (μg/L as Ni)	Stron-tium, dis-solved (μg/L as Sr)	Vana-dium, dis-solved (μg/L as V)	Zinc, dis-solved (μg/L as Zn)	Carbon, organic, dis-solved (mg/L as C)	Di-chloro-bromo-methane, total (μg/L)
FCW-3	<1	<3	<10	1,800	<10	<4	930	<0.1	<10	2	23	<6	<3	1.6	<0.2
GNW-1	<1	<3	<10	19	<10	<4	16	<.1	<10	3	45	<6	21	.8	<.2
GNW-14	<1	<3	<10	12	<10	<4	62	<.1	<10	5	58	<6	5	.3	<.2
GSW-101	<1	<3	<10	16	<10	<4	61	<.1	<10	3	42	<6	4	.7	<.2
MGW-1	<1	<3	<10	9	<10	<4	6	<.1	<10	3	67	<6	6	.3	<.2
NCW-8	<1	<3	<10	20	<10	<4	400	<.1	<10	7	59	<6	<3	.8	<.2
NJW-1	<1	<3	<10	160	<10	<4	630	<.1	<10	3	34	<6	4	.5	<.2
NJW-4	1	<3	<10	7	<10	<4	50	<.1	<10	3	70	<6	<3	.4	<.2
NJW-5	1	3	<10	17	<10	<4	790	<.1	<10	5	28	<6	<3	.6	<.2
WGW-19	2	4	<10	350	<10	<4	310	<.1	<10	3	67	<6	6	1.1	<.2
U.S. Environmental Protection Agency drinking-water regulations for listed property or chemical constituent															
SMCL[1]	--	--	1,000	300	--	--	50	--	--	--	--	--	5,000	--	--
MCL[2]	5	--	--	--	50	--	--	2.0	--	100	--	--	--	--	--

Table 7.-- *Chemical analyses of ground-water samples--Continued*

Local well number	Carbon tetra-chlo-ride, total (µg/L)	1,2-Di-chloro-ethane, total (µg/L)	Bromo-form, total (µg/L)	Chloro-di-bromo-methane, total (µg/L)	Chloro-form, total (µg/L)	Toluene, total (µg/L)	Benzene, total (µg/L)	Chloro-benzene, total (µg/L)	Chloro-ethane, total (µg/L)	Ethyl-benzene, total (µg/L)	Methyl-bromide, total (µg/L)	Methyl-chlo-ride, total (µg/L)	Methyl-ene chlo-ride, total (µg/L)	Tetra-chloro-ethyl-ene, total (µg/L)
FCW-3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
GNW-1	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
GNW-14	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
GSW-101	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
MGW-1	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
NCW-8	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
NJW-1	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
NJW-4	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
NJW-5	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
WGW-19	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
U.S. Environmental Protection Agency drinking-water regulations for listed property or chemical constituent														
SMCL[1]	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MCL[2]	5.0	5.0	--	--	--	--	5.0	--	--	--	--	--	--	--

Table 7.-- *Chemical analyses of ground-water samples*--Continued

Local well number	Tri-chloro-fluoro-methane, total (µg/L)	1,1-Di-chloro-ethane, total (µg/L)	1,1-Di-chloro-ethyl-ene, total (µg/L)	1,1,1-Tri-chloro-ethane, total (µg/L)	1,1,2-Tri-chloro-ethane, total (µg/L)	1,1,2,2-Tetra-chloro-ethane, total (µg/L)	1,2-Di-chloro-benzene, total (µg/L)	1,2-Di-chloro-propane, total (µg/L)	1,2-Transdi-chloro-ethene, total (µg/L)	1,3-Di-chloro-propene, total (µg/L)	1,3-Di-chloro-benzene, total (µg/L)	1,4-Di-chloro-benzene, total (µg/L)	2-Chloro-ethyl-vinyl-ether, total (µg/L)
FCW-3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
GNW-1	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
GNW-14	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
GSW-101	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
MGW-1	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
NCW-8	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
NJW-1	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
NJW-4	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
NJW-5	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
WGW-19	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
U.S. Environmental Protection Agency drinking-water regulations for listed property or chemical constituent													
SMCL[1]	--	--	--	--	--	--	--	--	--	--	--	--	--
MCL[2]	--	--	7.0	200	--	--	--	--	--	--	--	--	--

Table 7.-- *Chemical analyses of ground-water samples*--Continued

Local well number	Di-chloro-di-fluoro-methane, total (µg/L)	Trans-1,3-di-chloro-propene, total (µg/L)	Cis-1,3-di-chloro-propene, total (µg/L)	1,2-Dibromo-ethyl-ene, total (µg/L)	Vinyl-chlo-ride, total (µg/L)	Tri-chloro-ethyl-ene, total (µg/L)	Styrene, total (µg/L)	1,2-Dibromo-ethane total (µg/L)	Xylene, total recoverable (µg/L)
FCW-3	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.2
GNW-1	<.2	<.2	<.2	<0.2	<.2	<.2	<.2	--	<.2
GNW-14	<.2	<.2	<.2	--	<.2	<.2	<.2	<.2	<.2
GSW-101	<.2	<.2	<.2	--	<.2	<.2	<.2	<.2	<.2
MGW-1	.2	<.2	<.2	--	<.2	<.2	<.2	<.2	<.2
NCW-8	<.2	<.2	<.2	--	<.2	<.2	<.2	<.2	<.2
NJW-1	<.2	<.2	<.2	--	<.2	<.2	<.2	<.2	<.2
NJW-4	<.2	<.2	<.2	--	<.2	<.2	<.2	<.2	<.2
NJW-5	<.2	<.2	<.2	--	<.2	<.2	<.2	<.2	<.2
WGW-19	<.2	<.2	<.2	--	<.2	<.2	<.2	<.2	<.2
	U.S. Environmental Protection Agency drinking-water regulations for listed property or chemical constituent								
SMCL[1]	--	--	--	--	--	--	--	--	--
MCL[2]	--	--	--	--	2.0	5.0	100	--	10,000

[1] SMCL--Secondary Maximum Contaminant Level: Contaminants that affect the aesthetic quality of drinking water. At high concentrations or values, health implications as well as aesthetic degradation may also exist. SMCL's are not Federally enforceable but are intended as guidelines for the States (U.S. Environmental Protection Agency, 1992).

[2] MCL--Maximum Contaminant Level: Enforceable, health-based regulation that is to be set as close as is feasible to the level at which no known or anticipated adverse effects on the health of a person occur. The definition of feasible means the use of the best technology, treatment techniques, and other means that the Administrator of the U.S. Environmental Protection Agency finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are generally available (taking cost into consideration) (U.S. Environmental Protection Agency, 1992).

[3] A "less than" value in this column indicates that a value in either the nitrite or the nitrite plus nitrate analysis was below detection (nitrate was determined by subtracting the value for nitrite from the value for nitrite plus nitrate).

[4] Secondary level set by the New Hampshire Department of Environmental Services, Water Supply Bureau (New Hampshire Department of Environmental Services, Water Supply Bureau, written commun., 1987).

tion of chloride was 120 mg/L from well WGW-19; less than one-half of the USEPA (1992) secondary maximum contaminant level (SMCL[1]) for chloride (250 mg/L,) established as a taste threshold. The water samples from two wells had sodium concentrations (32 mg/L at well GSW-101 and 75 mg/L at well WGW-19) that exceeded the Health Advisory Level for sodium (20 mg/L) established by the USEPA (1992) as a recommended limit for people with heart, hypertension, or kidney problems. The ratio of Na to Cl in water from well WGW-19 was 1 to 1 meq/L (milliequivalents per liter), indicating that NaCl (probably from road salt) is the source of both constituents.

The pH of water is a measure of the hydrogen-ion activity. Water having a pH of 7.0 is neutral, less than 7.0 is acidic, and greater than 7.0 is alkaline. The pH of most ground water in the United States ranges from about 6.0 to 8.5 (Hem, 1985, p. 63-64). The pH of water sampled in the field ranged from 5.4 to 6.8; the median was 6.1. The range of pH in stratified-drift aquifers sampled for previous studies (Moore, 1990; Flanagan and Stekl, 1990; Mack and Lawlor, 1992; Moore and others, in press) in this series (1984-89) ranged from 5.3 to 8.5, and the median was 6.1. The most basic or alkaline ground-water samples came from well FCW-3 (6.8). In this study, the most acidic water was from wells GNW-1 (5.9), GNW-14 (6.0), GSW-101 (5.6), MGW-1 (6.2), NCW-8 (6.3), NJW-4 (5.8), and WGW-19 (5.4). All these samples had pH values that were less than the SMCL of 6.5 established by the USEPA (1992).

The alkalinity of a solution is defined as the capacity for solutes in water to react with and neutralize acid (Hem, 1985, p. 106). It is commonly thought of as an indicator of buffering capacity--the water's ability to resist changes in pH upon addition of an acid. Almost all of the alkalinity in most natural water can be attributed to carbonate and bicarbonate ions. Because stratified-drift aquifers in New Hampshire consist of sediment derived from bedrock with a low carbonate mineral content, alkalinity in New Hampshire ground water is generally low. Alkalinity in samples from this study was determined by incremental titration of unfiltered samples with aliquots of 0.01639N sulfuric acid to an end point of pH 4.5. For all the water samples, alkalinity ranged from 9.0 mg/L as $CaCO_3$ (at well GSW-101) to 25 mg/L as $CaCO_3$ (at well NCW-8). The median alkalinity, 14.5 mg/L as $CaCO_3$, indicates that water from this area has low alkalinity and, therefore, has low buffering capacity.

The predominant form of inorganic nitrogen in natural water is nitrate, an oxidized, highly soluble compound. Excess nitrate in ground water can originate from fertilizer applications, leachate from sewage systems, or agricultural wastes. Nitrate (NO_3 as N) in ground water has been linked to methemoglobinemia, or blue-baby syndrome (Lukens, 1987). For all the samples, the concentration of NO_3 as N was the highest in the water from well GNW-14 (1.09 mg/L). This concentration is less than the maximum contaminant level (MCL[2]) for NO_3 as N (10 mg/L) established by the USEPA (1992). Inorganic nitrogen also can be present as nitrite or ammonium. In all the water samples, nitrogen concentrations as ammonium ranged from less than 0.01 to 0.04 mg/L.

The sulfate (SO_4^{-2}) ion is one of the major anions in natural water. Oxidation of sulfide ores, gypsum, and anhydrite and atmospheric deposition are sources of sulfate, but sulfate-producing minerals generally are not present in stratified-drift aquifers in New Hampshire. Sulfate is reduced by anaerobic bacteria to hydrogen sulfide gas (H_2S), which can be detected by smell at concentrations of only a few tenths of a milligram per liter. The sulfate concentration for all the ground-water samples ranged from 4.6 to 14.0 mg/L, and the median was 8.05 mg/L. The SMCL for sulfate (SO_4^{-2}) in drinking water is 250 mg/L.

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[1] SMCL, Secondary Maximum Contaminant Level: Contaminants that affect the aesthetic quality of drinking water. At high concentrations or values, health implications as well as aesthetic degradation may also exist. SMCL's are not Federally enforceable but are intended as guidelines for the States (U.S. Environmental Protection Agency, 1992).

[2] MCL, Maximum Contaminant Level: Enforceable, health-based regulation that is to be set as close as is feasible to the level at which no known or anticipated adverse effects on the health of a person occur. The term feasible means the use of the best technology, treatment techniques, and other means that the Administrator of the U.S. Environmental Protection Agency determines, after examination for efficacy under field conditions and not solely under laboratory conditions, are generally available (taking cost into consideration) (U.S. Environmental Protection Agency, 1992).

Manganese and iron are common elements in minerals in stratified-drift deposits within this study area. Elevated concentrations of manganese, often accompanied by elevated concentrations of iron, were the most common water-quality problem found during this investigation. Manganese, an abundant metallic element, is an undesirable impurity in water because of its tendency to deposit black oxide stains (Hem, 1985, p. 85). Water from seven wells had manganese concentrations that exceeded the SMCL of 50 μg/L (U.S. Environmental Protection Agency, 1992)--930 μg/L at FCW-3, 62 μg/L at GNW-14, 61 μg/L at GSW-101, 400 μg/L at NCW-8, 630 μg/L at NJW-1, 790 μg/L at NJW-5, and 310 μg/L at WGW-19. Iron, if present in excessive amounts in residential water supplies, forms red oxyhydroxide precipitates that can stain clothes and plumbing fixtures. Concentrations of iron in water from two of the sampled wells, 1,800 μg/L at well FCW-3 and 350 μg/L at well WGW-19, exceeded the SMCL of 300 μg/L (U.S. Environmental Protection Agency, 1992).

Aluminum (Al), the third most abundant element in the Earth's crust, rarely is present in water at concentrations greater than a few tenths or hundredths of a milligram per liter (Hem, 1985, p. 73). Exceptions can be found in highly acidic waters where the Al^{+3} ion is dissolved. Water from well WGW-19 had the highest aluminum concentration, 90 μg/L (0.09 mg/L), and the lowest pH value, 5.4.

Most trace metals are present in the soil as cations that are strongly adsorbed by oxides and hydroxides (particularly aluminum, iron, and manganese) and complexed by organic ligands at near-neutral values of pH (Drever, 1982); the dissolved concentrations are, therefore, usually low. All of the ground-water samples analyzed had trace-metal concentrations that are either below or more than two times the detection limit for the following metals: boron, cadmium, cobalt, copper, lead, lithium, molybdenum, mercury, and vanadium. In addition, the concentrations of the following metals were within the range of values commonly found in natural water (Hem, 1985): dissolved barium, beryllium, nickel, strontium, and zinc.

Detectable concentrations of arsenic were found in the water from three wells; 3 μg/L in water from well FCW-3, and NCW-8, and 6 μg/L in water from well NJW-1. These values were less than the MCL of 50 μg/L.

Water from wells sampled in this study was tested for 37 VOC's. All of the samples tested had concentrations of VOC's that were less than the detection level of 0.2 μg/L.

SUMMARY AND CONCLUSIONS

The middle Merrimack River basin in south-central New Hampshire encompasses an area of 469 mi^2, which is underlain by approximately 98 mi^2 of stratified drift. A 22-percent increase in population from 1980 to 1989 has caused an increased demand on the water resources of this area. At present (1992), ground-water withdrawals from stratified drift for public supply within the basin do not exceed 0.4 Mgal/d. The towns of Goffstown and Hooksett are the primary users of this water. Many of the shallow stratified-drift aquifers within the study area could be valuable sources of domestic and municipal water supplies, but they are not developed to their fullest potential.

Stratified-drift deposits in the basin largely reflect local and regional glacial-lake environments that existed at the time of deposition. Many are deltas deposited into glacial lakes or locally ponded meltwater.

Stratified-drift aquifers in the southwestern part of the study area are generally thin, and much of the stratified drift consists of fine-grained glaciolacustrine sediment. Transmissivities are generally less than 1,000 ft^2/d. Some of these deposits, however, are capable of supplying enough potable water for domestic or small community supply.

Stratified-drift aquifers in the western and central parts of the study area are composed of fine-grained lacustrine and coarse-grained ice-contact deposits. Saturated thicknesses of these stratified-drift deposits exceed 100 ft in places. A total of 14 stratified-drift aquifers have transmissivities greater than 1,000 ft^2/d. Transmissivity in the most productive aquifers exceeded 6,000 ft^2/d.

Stratified-drift aquifers in the eastern part of the study area were formed in regional glacial-lake environments. Glacial Lakes Merrimack and Hooksett had a profound effect on the deposition of stratified drift in the Merrimack River valley. This large river valley contains extensive eskers, kames, and deltas, as well as the fine-grained lacustrine deposits. The influence of these glacial lakes extends into the larger tributary valleys for several miles. Total saturated thicknesses of stratified-drift aquifers in this area are commonly greater than 20 ft and exceed 150 ft in some areas. Transmissivities are locally greater than 2,000 ft^2/d.

Of the potentially valuable aquifers in the middle Merrimack River basin, only the Goffstown aquifer, Peters Brook aquifer, and the Pinnicle Pond (part of the Brickyard Brook and Pinnacle Pond aquifer) are currently being used for a public water supply. At least one of these, the Goffstown aquifer, may not be developed to its capacity. Stratified-drift aquifers with the greatest potential for supply include the Smithville aquifer, Russell Station Road aquifer, Goffstown aquifer, Brickyard Brook part of the Brickyard Brook and Pinnacle Pond aquifer, South Bow aquifer, and upper Piscataquog River aquifer.

The stratified-drift aquifer in Goffstown was selected for a detailed analysis of potential yield. This 1.2 mi^2 aquifer is one of the most productive aquifers in the study area and is hydraulically connected to a river system. A two-dimensional numerical flow model was used to simulate the aquifer system, and the results showed that the Goffstown aquifer may be capable of supplying 3.9 ft^3/s (2.5 Mgal/d). Sensitivity analysis showed that the estimated yield was most sensitive to changes in hydraulic conductivity. Streambed conductance was also important because it affected the source of water to the hypothetically pumped wells.

The quality of water from 10 wells finished in stratified drift was shown to be suitable for drinking and other domestic uses. Sites of known ground-water contamination were not sampled. Water samples from two wells had elevated sodium concentrations of 32 and 75 mg/L, respectively. These elevated concentrations may be a result of the proximity of the wells to highways where road salt is applied for deicing.

Water samples from two wells had elevated iron concentrations of 1,800 μg/L and 350 μg/L, respectively. Seven wells had manganese concentrations that equaled or exceeded the SMCL of 50 μg/L. The pH of water from seven wells was less than the SMCL of 6.5 established by USEPA in secondary drinking-water regulations. Water from each of the 10 wells was shown to be free of VOC's at a detection limit of 0.2 μg/L.

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GLOSSARY

Ablation till: Loosely consolidated rock debris, formerly carried by glacial ice, that accumulated in place as the surface ice was removed by ablation (melting).

Aquifer: A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable materials to yield significant quantities of water to wells and springs. Where water only partly fills an aquifer, the upper surface of the saturated zone is free to rise and decline.

Aquifer boundary: A geologic or hydrologic feature that limits the extent of an aquifer.

Base flow: That part of the stream discharge that is not attributable to direct runoff from precipitation or melting snow; it is sustained by ground-water discharge to the stream channel.

Bedrock: Solid rock, locally called "ledge," that forms the earth's crust. It may be exposed at the surface but more commonly is buried beneath a few inches to more than 100 feet of unconsolidated deposits.

Coefficient of determination (R^2): A measure of the proportion of variation in the dependent variable that can be explained by the regression model:

$$R^2 = 1 - \frac{\text{Error sum of squares}}{\text{Total sum of squares}}$$

Cone of depression: A depression produced in a water table or other potentiometric surface by the withdrawal of water from an aquifer; in cross section, it is shaped like an inverted cone with its apex at the pumped well.

Confined aquifer: An aquifer saturated with water and bounded above and below by material having a distinctly lower hydraulic conductivity than the aquifer itself.

Contact: A plane or irregular surface between two types or ages of rocks or unconsolidated sediments.

Cubic foot per second (ft^3/s): A unit expressing rate of discharge. One cubic foot per second is equal to the discharge of a stream 1 foot wide and 1 foot deep flowing at an average velocity of 1 foot per second.

Cubic foot per second per square mile [$(ft^3/s)/mi^2$]: A unit expressing average number of cubic feet of water flowing per second from each square mile of area drained.

Darcy's Law: An equation relating the factors controlling ground-water flow. Darcy's law can be expressed as

$$Q = KA\left(\frac{dh}{dl}\right)$$

where Q is the quantity of water per unit of time; K is the hydraulic conductivity, which depends on the size and arrangement of the water-transmitting openings (pores and fractures) and on the dynamic characteristics of the fluid (water) such as kinematic viscosity, density, and the strength of the gravitational field; A is the cross-sectional area, at a right angle to the flow direction, through which the flow occurs; and dh/dl is the hydraulic gradient.

Deposit: Earth material that has accumulated by some natural process.

Dissolved solids: The residue from a clear sample of water after evaporation and drying for 1 hour at 180 °C; consists primarily of dissolved mineral constituents, but may also contain organic matter and water of crystallization.

Drainage area: The area or tract of land, measured in a horizontal plane, that gathers water and contributes it ultimately to some point on a stream channel, lake, reservoir, or other water body.

Drawdown: The lowering of the water table or potentiometric surface caused by the withdrawal of water from an aquifer by pumping; equal to the difference between the static water level and the pumping water level.

Effective grain size: The grain size at which 10 percent of the sample consists of grains smaller than the effective size and 90 percent consists of grains larger than the effective size.

Esker: A long ridge of sand and gravel that was deposited by water flowing in tunnels within or beneath glacial ice.

First quartile: For a set of measurements arranged in order of magnitude, that value at which 25 percent of the measurements are smaller and 75 percent are larger.

Flow duration of a stream: The percentage of time during which specified discharges are equaled or exceeded within a given time period. In this report, flow duration refers to mean daily discharges for the entire period of record at streamflow-gaging stations of interest.

Fluvial: Pertaining to the flow of liquid water in the natural environment.

Fracture: A break, crack, or opening in bedrock along which water can flow.

Glacial lake: A lake that derives much or all of its water from the melting of glaciers. In this study area, it refers to areas where such lake water was dammed by glacial ice and (or) topographic features.

Glaciolacustrine: Pertaining to deposits in glacial lakes; especially deposits such as deltas and varved sediments, composed of material brought by meltwater streams flowing into lakes bordering the glacier.

Gneiss: A coarse-grained metamorphic rock characterized by alternating bands of granular and micaceous minerals.

Granite: A coarse-grained, light-colored igneous rock.

Gravel: Unconsolidated rock debris composed principally of particles with a median diameter larger than 2 millimeters.

Ground water: Water beneath the water table in soils or geologic formations that are fully saturated.

Ground-water discharge: The discharge of water from the saturated zone by (1) natural processes such as ground-water seepage into stream channels and ground-water evapotranspiration and (2) discharge through wells and other manmade structures.

Ground-water divide: A ridge in the water table or other potentiometric surface from which the ground water, represented by that surface, moves away in both directions.

Ground-water recharge: Water that is added to the saturated zone of an aquifer.

Ground-Water Site Inventory (GWSI): A computerized data storage and retrieval system maintained by the U.S. Geological Survey that contains information about wells and springs collected throughout the United States.

Head, static: The height of the surface of a water column above a standard datum that can be supported by the static pressure at a given point.

Hydraulic conductivity (K): A measure of the ability of a porous medium to transmit a fluid; it can be expressed in mathematically reduced form as unit length per unit time. It is the volume of water at the prevailing kinematic viscosity that will move in a unit time under a unit hydraulic gradient through a unit area at right angles to the direction of flow.

Hydraulic gradient: The change in static head per unit of distance in a given direction. If not specified, the direction is generally understood to be that of the maximum rate of decrease in head.

Hydrograph: A graph showing stage (height), flow velocity, or other property of water with respect to time.

Ice-contact deposits: Stratified drift deposited in contact with melting glacial ice. Landforms include eskers, kames, kame terraces, and grounding-line deltas.

Igneous: Descriptive term for rocks or minerals solidified from molten or partially molten material; that is, from a magma, such as basalt or granite.

Induced infiltration: The process by which water infiltrates an aquifer from an adjacent surface-water body in response to pumping.

Kame: A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by glacial meltwater; the precise mode of formation is uncertain.

Kame terrace: A terracelike ridge consisting of stratified sand and gravel formed as a glaciofluvial deposit between a melting glacier or stagnant ice lobe and a higher valley wall, left standing after the disappearance of the ice.

Lacustrine: Pertaining to lake environments. In this study, it refers to areas associated with glacial-lake environments.

Lodgement till: A firm, compact clay-rich till deposited beneath a moving glacier, containing abraided stones oriented, in general, with their long axes parallel to the direction of ice movement.

Mean (arithmetic): The sum of the individual values of a set, divided by their total number; also referred to as the "average."

Median: The middle value of a set of measurements that are ordered from lowest to highest, 50 percent of the measurements are smaller than the median and 50 percent are larger.

Metamorphic: Descriptive term for rocks such as gneiss and schist, which have formed, in the solid state, from other rocks.

Microgram(s) per liter (μg/L): A unit expressing the concentration of chemical constituents in solution as the mass (micrograms) of a constituent per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligram(s) per liter (mg/L): A unit for expressing the concentration of chemical constituents in solution as the mass (milligrams) of a constituent per unit volume (liter) of water.

Morphosequence: A sequence of glacial recessional deposits that begins with ice-proximal deposits (eskers, kames) and grades to ice-distal deposits (deltas, outwash plains), marking the retreating positions of the last ice sheet in New England.

Outwash: Stratified deposits chiefly of sand and gravel removed or "washed out" from a glacier by meltwater streams and deposited beyond the margin of a glacier. Usually deposited as flat or gently sloping outwash plains.

Outwash deltas: Deltas formed beyond the margin of the glacier where glacial meltwater entered a water body.

pH: The negative logarithm of the hydrogen-ion activity. A pH of 7.0 indicates neutrality; values below 7.0 denote an acidic solution or condition, and those above 7.0 denote an alkaline solution or condition.

Phi grade scale: A logarithmic transformation of the Wentworth grade scale based on the negative logarithm to the base 2 of the particle diameter, in millimeters (4 mm = -2 phi, 2 mm = -1 phi, 1 mm = 0 phi, 0.5 mm = 1 phi, and so on).

Porosity: The property of a rock or unconsolidated deposit that is a measure of the size and number of internal voids or open spaces; it may be expressed quantitatively as the ratio of the volume of its open spaces to its total volume.

Potentiometric surface: A surface which represents static head. As related to an aquifer, it is defined by the levels to which water will rise in tightly cased wells. The water table is a particular potentiometric surface.

Precipitation: The discharge of water from the atmosphere, either in a liquid or solid state.

Quartzite: A metamorphic rock consisting mainly of quartz and formed by recrystalization of quartz.

Runoff: That part of the precipitation that appears in streams. It is the same as streamflow unaffected by artificial diversions, storage, or other human activities in or on the stream channels.

Saturated thickness (of stratified drift): Thickness of stratified drift extending down from the water table to the till or bedrock surface.

Saturated zone: The subsurface zone in which all open (interconnected) spaces are filled with water. Water below the water table, the upper limit of the saturated zone, is under pressure that is greater than atmospheric pressure.

Schist: A metamorphic rock with subparallel orientation of the visible micaceous minerals, which dominate its composition.

Sediment: Fragmental material that originates from the weathering of rocks. It can be transported by, suspended in, or deposited by water.

Slate: A compact, fine-grained metamorphic rock that is platy and formed from shale.

Specific yield: Ratio of the volume of water that a given mass of saturated rock or soil will yield by gravity from that mass.

Standard deviation: A measure of the amount of variability within a sample; it is the square root of the sample variance or the average of the squares of the deviations about the arithmetic mean of a set of data.

Storage coefficient: The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head. In an unconfined aquifer, the storage coefficient is virtually equal to the specific yield.

Stratified drift: Sorted and layered unconsolidated material deposited in meltwater streams flowing from glaciers or settled from suspension in quiet-water bodies fed by meltwater streams.

Surficial geology: The study of or distribution of unconsolidated deposits at or near the land surface.

Third quartile: For a set of measurements arranged in order of magnitude, that value where 75 percent of the measurements are smaller than the value and 25 percent are larger.

Till: A predominantly nonsorted, nonstratified sediment deposited directly by a glacier and composed of boulders, gravel, sand, silt and clay mixed in various proportions.

Transmissivity: The rate at which water at the prevailing kinematic viscosity is transmitted through a unit width of aquifer under a unit hydraulic gradient. Equal to the average hydraulic conductivity times the saturated thickness.

Unconfined aquifer (water-table aquifer): An aquifer only partly filled with water. In such aquifers, the water is unconfined in that the water table or upper surface of the saturated zone is at atmospheric pressure and is free to rise and fall.

Unsaturated zone: The zone between the water table and the land surface in which the open spaces are not completely filled with water.

Water table: The upper surface of the saturated zone. Water at the water table is at atmospheric pressure. The water table is a particular potentiometric surface.

Yield: An amount of water potentially available for water supply; in this study, "yield" refers to water wells.

APPENDIX A

Appendix A.--Description of selected wells and borings

Local site number: First two characters are U.S. Geological Survey town code. Third character indicates-- A, auger hole; B, highway bridge boring; W, well. The numbers are sequential numbers for each town.

Latitude, longitude: Accurate within 5 seconds.

Method of construction: B, bored or augered; C, cable tool; D, dug; W, drive and wash; Z, other.

Elevation: Elevations are expressed in feet above National Geodetic Vertical Datum of 1929; those in whole feet are interpolated from U.S. Geological Survey topographic maps and are accurate to plus or minus half the contour interval of the map (5 to 10 feet); those in tenths of feet are instrumentally determined.

Depth of hole: Depth drilled in feet below land-surface datum.

Depth of well: Depth of well in feet below land-surface datum.

Depth to refusal: Depth to refusal on bedrock, in till, or on large boulders.

Primary aquifer code: Primary aquifer code of well or boring; codes for geologic ages and materials are listed below.

110SDMN, Quaternary sediment, undifferentiated
111ALVM, Holocene alluvium
112OTSH, Pleistocene outwash
112LCSR, Pleistocene lacustrine deposits
112SRFD, Pleistocene stratified drift
112TILL, Pleistocene till
BEDROCK, Bedrock

Casing material code: P, Polyvinyl choloride or plastic; S, steel; R, rock or stone.

Depth to bottom of casing: Depth to the bottom of casing, in feet below land surface datum (for wells where Primary aquifer code' is BEDROCK, the depth to the bottom of casing can be used to indicate the depth to the bedrock surface).

Water level: Water level, in feet below land-surface datum; mm-dd-yy is month-day-year.

Use: Use of water codes are as follows: C, commercial; H, domestic; P, public; N, industrial; T, institutional; U, unused; Z, other.

Name of driller or New Hampshire Water Resources Division driller number: NH HWY DEPT, New Hampshire Highway Department; NHWRD, New Hampshire Water Resources Division; USGS, U.S. Geological Survey.

(--, no data

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
Hillsborough County									
Bedford									
BIA 1	425450	0712829	Evans, Helen	1988	B	--	20	--	20
BIA 2	425455	0712727	State of New Hampshire	1989	B	150	30	--	30
BIA 3	425601	0712806	State of New Hampshire	1989	B	190	43	--	43
BIA 4	425753	0712833	State of New Hampshire	1989	B	190	62	--	62
BIB 1	425711	0712842	NH Department of Transportation	1958	--	160	25	--	34
BIB 2	425707	0712825	NH Department of Transportation	1954	--	140	25	--	--
BIB 3	425704	0712825	NH Department of Transportation	--	--	170	19	--	19
BIB 4	425703	0712825	NH Department of Transportation	1958	--	160	51	--	51
BIB 5	425649	0712740	NH Department of Transportation	--	--	140	57	--	--
BIB 6	425735	0712948	NH Department of Transportation	1958	--	240	81	--	--
BIB 8	425800	0713021	NH Department of Transportation	1964	--	240	12	--	12
BIB 9	425631	0713139	NH Department of Transportation	1979	--	240	6	--	--
BIB 10	425705	0712841	NH Department of Transportation	1959	--	157	54	--	--
BIB 11	425655	0712822	NH Department of Transportation	1959	--	164	39	--	39
BIB 12	425650	0712820	NH Department of Transportation	1959	--	172	15	--	15
BIW 4	425814	0713040	New Hampshire	1965	W	240	9.0	9.0	--
BIW 8	425722	0713249	--	--	--	346	12.5	12.5	--
BIW 11	425448	0712832	Evans, Helen	1988	B	--	44	40	44
BIW 12	425542	0712900	Hunt, J.	1989	B	180	68	60	68
BIW 14	425756	0712958	St. Josephs Cemetary	1989	B	260	76	60	76
BIW 17	425732	0712955	State of New Hampshire	1989	B	230	75	40	75
BIW 18	425641	0712921	Bedford, Town of	1989	B	240	39	30	--
BIW 19	425440	0713039	Bedford, Town of	1989	B	280	50.5	50	51
BIW 81	425550	0712940	H & M Const	1984	Z	230	--	305	--
BIW 83	425705	0713003	Chiocca & Assoc	1984	C	250	--	142	--
BIW 85	425420	0713148	Foxwood Homes Inc	1984	Z	230	--	145	--
BIW 90	425422	0713147	Bayberry Homes	1984	Z	230	--	125	--
BIW 93	425824	0713059	Bisson	1984	Z	270	--	240	--
BIW 98	425440	0713144	JCH Const	1984	Z	230	--	160	--
BIW 100	425614	0713053	Town of Bedford	1984	Z	250	--	320	--
BIW 112	425605	0712933	Karoutsos Const	1984	Z	230	--	300	--
BIW 114	425628	0712908	Manchester Country Club	1984	Z	220	--	300	--
BIW 115	425523	0713059	Peck	1984	Z	240	--	400	--
BIW 137	425701	0712951	Hughes	1984	Z	260	--	145	--
BIW 141	425709	0713001	Couture Bros	1984	Z	240	--	305	--
BIW 144	425706	0713005	Chiocca & Associates	1984	C	250	--	388	--
BIW 146	425605	0713258	Urban	1984	Z	320	--	270	--
BIW 154	425359	0713324	A.J. Lampbert	1984	Z	250	--	400	--
BIW 176	425418	0713321	Flynn, N.	1985	Z	250	--	600	--
BIW 178	425615	0712834	Moren, G.	1984	Z	240	--	407	--

wells and borings
available]

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County										
Bedford										
BIA 1	112SRFD	--	--	--	--	--	--	U	--	USGS
BIA 2	112SRFD	--	--	--	--	--	--	--	--	USGS
BIA 3	112SRFD	--	--	--	--	--	--	--	--	USGS
BIA 4	112SRFD	--	--	--	--	--	--	--	--	USGS
BIB 1	--	--	--	--	--	--	--	--	--	--
BIB 2	--	--	--	--	--	--	--	--	--	--
BIB 3	--	--	--	--	--	--	--	--	--	--
BIB 4	--	--	--	--	--	--	--	--	--	--
BIB 5	--	--	--	--	--	--	--	--	--	--
BIB 6	--	--	--	--	--	--	--	--	--	--
BIB 8	--	--	--	--	--	--	--	--	--	--
BIB 9	--	--	--	--	--	--	--	--	--	--
BIB 10	--	--	--	--	--	--	--	--	--	--
BIB 11	--	--	--	--	--	--	--	--	--	--
BIB 12	--	--	--	--	--	--	--	--	--	--
BIW 4	112LCSR	2	S	7	7.00	4.00	02-01-67	U	--	NH HWY DEPT
BIW 8	--	--	--	--	--	5.9	04-18-86	U	--	--
BIW 11	112SRFD	2	--	37.5	37.5	20.4	12-06-88	U	--	USGS
BIW 12	112SRFD	2	P	57.5	57.5	45.9	03-28-90	U	--	USGS
BIW 14	112SRFD	2	P	57.5	57.5	29.4	08-31-89	U	--	USGS
BIW 17	112SRFD	2	P	37.5	37.5	13.5	08-31-89	U	--	USGS
BIW 18	112SRFD	2	P	27.5	27.5	15.9	03-28-90	U	--	USGS
BIW 19	112SRFD	2	P	47.5	47.5	3.31	08-31-89	U	--	USGS
BIW 81	BEDROCK	--	--	49.0	--	20.0	02-21-84	H	4.00	NHWRD 208
BIW 83	BEDROCK	--	--	38.0	--	--	--	H	8.00	NHWRD 65
BIW 85	BEDROCK	--	--	34.0	--	15.0	03-12-84	H	1.00	NHWRD 59
BIW 90	BEDROCK	--	--	29.0	--	--	--	H	2.50	NHWRD 59
BIW 93	BEDROCK	--	--	40.0	--	--	--	H	4.00	NHWRD 327
BIW 98	BEDROCK	--	--	30.0	--	--	--	H	4.00	NHWRD 327
BIW 100	BEDROCK	--	--	99.0	--	--	--	Z	1.00	NHWRD 327
BIW 112	BEDROCK	--	--	40.0	--	8.0	07-19-84	H	30.0	NHWRD 327
BIW 114	BEDROCK	--	--	96.0	--	--	--	C	8.50	NHWRD 327
BIW 115	BEDROCK	--	--	40.0	--	--	--	H	2.50	NHWRD 327
BIW 137	BEDROCK	--	--	20.0	--	--	--	H	15.0	NHWRD 1
BIW 141	BEDROCK	--	--	37.0	--	--	--	H	8.00	NHWRD 59
BIW 144	BEDROCK	--	--	41.0	--	18.0	10-15-84	H	20.0	NHWRD 65
BIW 146	BEDROCK	--	--	59.0	--	--	--	H	12.0	NHWRD 327
BIW 154	BEDROCK	--	--	19.0	--	25.0	10-12-84	H	30.0	NHWRD 327
BIW 176	BEDROCK	--	--	40.0	--	--	--	H	2.00	NHWRD 327
BIW 178	BEDROCK	--	--	19.0	--	12.0	10-22-84	H	1.33	NHWRD 344

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Hillsborough County--Continued						
			Bedford--Continued						
BIW 188	425618	0712851	O'Reilly, J.	1985	Z	240	--	700	--
BIW 195	425400	0713326	Foxwood Homes Incorporated	1985	Z	240	--	140	--
BIW 199	425356	0713322	Foxwood Homes Incorporated	1985	Z	230	--	378	--
BIW 202	425557	0713300	Normond, A.	1984	Z	300	--	235	--
BIW 203	425557	0713257	Normond, A.	1984	Z	310	--	265	--
BIW 211	425600	0712928	Karoutsas Roofing & Siding	1984	Z	225	--	235	--
BIW 219	425619	0712946	Silberberg, G.	1984	C	230	--	140	--
BIW 229	425627	0713138	Clement, D.	1985	Z	240	--	340	--
BIW 257	425634	0713132	Doherty, K.	1985	Z	250	--	180	--
BIW 258	425549	0713115	Hebert	1985	Z	230	--	440	--
BIW 259	425551	0713117	Apple Construction	1985	Z	230	--	220	--
BIW 268	425610	0712820	Schell, O.	1985	Z	220	--	100	--
BIW 277	425657	0712953	Chiocca Associates	1985	C	250	--	198	--
BIW 281	425405	0713331	Foxwood Homes Incorporated	1985	Z	220	--	220	--
BIW 291	425502	0713053	Moore, A.	1985	Z	210	--	190	--
BIW 306	425612	0713138	French, H.	1985	Z	250	--	200	--
BIW 310	425451	0712858	Merrill, F.	1985	Z	220	--	205	--
BIW 314	425722	0713003	Wang Building	1985	Z	240	--	800	--
BIW 317	425632	0712926	Langer, J.	1985	Z	225	--	100	--
BIW 326	425401	0713327	Foxwood Homes Incorporated	1985	Z	230	--	140	--
BIW 330	425722	0713022	New Eng Comm Group Incorporated	1985	Z	250	--	220	--
BIW 331	425545	0713118	Despathy	1985	Z	240	--	187	--
BIW 333	425401	0713329	Foxwood Homes Incorporated	1985	Z	220	--	140	--
BIW 353	425404	0713330	Petrin	1986	Z	220	--	420	--
BIW 355	425547	0713116	Apple Construction	1985	Z	230	--	140	--
BIW 357	425419	0713319	Foxwood Homes Incorporated	1985	Z	250	--	500	--
BIW 358	425403	0713330	Foxwood Homes Incorporated	1985	Z	220	--	140	--
BIW 378	425448	0712856	Delaney, J.	1984	Z	220	--	150	--
BIW 386	425506	0713258	Higgins, B.	1985	Z	290	--	250	--
BIW 387	425451	0712842	Bongiardina, J.	1985	Z	210	--	125	--
BIW 416	425553	0712927	Karoutsas Roofing & Siding	1986	Z	225	--	420	--
BIW 418	425555	0712923	Karoutsas Roofing & Siding	1986	Z	225	--	295	--
BIW 448	425629	0712921	Parkview Construction	1986	Z	220	--	260	--
BIW 457	425430	0712836	Tri City Construction	1986	Z	230	--	325	--
BIW 458	425432	0712836	Tri City Construction	1986	Z	220	--	165	--
BIW 460	425452	0712853	Sadais, M.	1986	Z	215	--	525	--
BIW 481	425458	0712928	Fitzgerald, G.	1986	Z	260	--	404	--
BIW 497	425703	0712932	Matta, L.	1986	Z	230	--	322	--
BIW 512	425540	0712936	Parkland Construction	1986	Z	250	--	305	--
BIW 531	425726	0712947	Alpha Realty	1986	Z	230	--	445	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number

Hillsborough County--Continued

Bedford--Continued

BIW 188	BEDROCK	--	--	19.0	--	--	--	H	2.00	NHWRD 413
BIW 195	BEDROCK	--	--	19.0	--	--	--	H	6.00	NHWRD 327
BIW 199	BEDROCK	--	--	40.0	--	--	--	H	6.00	NHWRD 327
BIW 202	BEDROCK	--	--	20.0	--	12.0	11-16-84	H	20.0	NHWRD 1
BIW 203	BEDROCK	--	--	20.0	--	10.0	11-18-84	H	3.00	NHWRD 1
BIW 211	BEDROCK	--	--	83.0	--	--	--	H	7.00	NHWRD 1
BIW 219	BEDROCK	--	--	39.0	--	--	--	H	35.0	NHWRD 6
BIW 229	BEDROCK	--	--	40.0	--	30.0	05-23-85	H	25.0	NHWRD 327
BIW 257	BEDROCK	--	--	42.0	--	--	--	H	6.00	NHWRD 327
BIW 258	BEDROCK	--	--	36.0	--	--	--	H	15.0	NHWRD 327
BIW 259	BEDROCK	--	--	40.0	--	--	--	H	20.0	NHWRD 327
BIW 268	BEDROCK	--	--	46.0	--	--	--	H	50.0	NHWRD 177
BIW 277	BEDROCK	--	--	29.0	--	19.0	08-27-85	H	20.0	NHWRD 65
BIW 281	BEDROCK	--	--	29.0	--	--	--	H	20.0	NHWRD 327
BIW 291	BEDROCK	--	--	40.0	--	--	--	H	30.0	NHWRD 1
BIW 306	BEDROCK	--	--	28.0	--	16.0	10-02-85	H	50.0	NHWRD 327
BIW 310	BEDROCK	--	--	59.0	--	20.0	10-12-85	H	150	NHWRD 243
BIW 314	BEDROCK	--	--	37.0	--	21.0	04-01-85	C	8.50	NHWRD 327
BIW 317	BEDROCK	--	--	92.0	--	30.0	10-09-85	H	100	NHWRD 327
BIW 326	BEDROCK	--	--	40.0	--	--	--	H	7.50	NHWRD 327
BIW 330	BEDROCK	--	--	40.0	--	--	--	C	60.0	NHWRD 327
BIW 331	BEDROCK	--	--	40.0	--	--	--	H	15.0	NHWRD 327
BIW 333	BEDROCK	--	--	19.0	--	--	--	H	20.0	NHWRD 327
BIW 353	BEDROCK	--	--	40.0	--	--	--	H	3.00	NHWRD 327
BIW 355	BEDROCK	--	--	39.0	--	--	--	H	20.0	NHWRD 327
BIW 357	BEDROCK	--	--	40.0	--	--	--	H	3.00	NHWRD 327
BIW 358	BEDROCK	--	--	40.0	--	--	--	H	15.0	NHWRD 327
BIW 378	BEDROCK	--	--	41.0	--	--	--	H	25.0	NHWRD 192
BIW 386	BEDROCK	--	--	41.0	--	20.0	12-19-85	H	2.00	NHWRD 105
BIW 387	BEDROCK	--	--	24.0	--	11.0	11-17-85	H	12.0	NHWRD 105
BIW 416	BEDROCK	--	--	78.0	--	--	--	H	6.00	NHWRD 1
BIW 418	BEDROCK	--	--	151	--	--	--	H	20.0	NHWRD 1
BIW 448	BEDROCK	--	--	167	--	--	--	H	5.00	NHWRD 406
BIW 457	BEDROCK	--	--	38.0	--	--	--	H	1.00	NHWRD 105
BIW 458	BEDROCK	--	--	32.0	--	6.0	04-15-86	H	4.50	NHWRD 105
BIW 460	BEDROCK	--	--	51.0	--	50.0	05-07-86	H	10.0	NHWRD 549
BIW 481	BEDROCK	--	--	20.0	--	--	--	H	.75	NHWRD 315
BIW 497	BEDROCK	--	--	51.0	--	--	--	H	3.00	NHWRD 406
BIW 512	BEDROCK	--	--	19.0	--	30.0	06-14-86	H	6.00	NHWRD 521
BIW 531	BEDROCK	--	--	91.0	--	25.0	10-15-86	H	20.0	NHWRD 59

Local site number	Lat- itude	Long- itude	Owner or user	Year comp- leted	Method of con- struct- ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Hillsborough County--Continued						
			Bedford--Continued						
BIW 538	425606	0713028	Pieczarka, R.	1986	Z	240	--	205	--
BIW 542	425548	0712905	Messina	1984	Z	230	--	245	--
BIW 543	425546	0712904	O'Brien, B.	1985	Z	220	--	585	--
BIW 547	425528	0712800	Englewood Common	1986	Z	210	--	380	--
BIW 559	425710	0712919	Saxton, W.	1986	Z	220	--	320	--
BIW 560	425510	0713254	Dion, P.	1986	Z	290	--	230	--
BIW 561	425504	0713301	Dion, P.	1986	Z	290	--	250	--
BIW 582	425718	0712944	RE Cooke Company	1986	Z	200	--	400	--
BIW 585	425548	0712921	Pontell, P.	1986	Z	220	--	755	--
BIW 602	425724	0712925	Pidela Corporation	1986	Z	220	--	600	--
BIW 609	425505	0712854	Samson Construction, C.	1986	Z	230	--	400	--
BIW 613	425502	0712857	Samson Construction, C.	1986	Z	230	--	400	--
BIW 631	425659	0712955	Hawthorne Construction	1986	Z	250	--	205	--
BIW 652	425623	0712844	Paradise, R.	1987	Z	240	--	805	--
BIW 653	425606	0713032	Rioux, M.	1986	Z	240	--	245	--
BIW 654	425703	0712905	Charles Howard III	1985	Z	230	--	430	--
BIW 658	425718	0712952	Harrington	1986	Z	220	--	605	--
BIW 662	425410	0713248	Martin, K.	1987	Z	260	--	130	--
BIW 665	425719	0712929	Couture Brothers	1987	Z	180	--	305	--
BIW 668	425553	0712836	LaChance, E.	1987	Z	220	--	380	--
BIW 669	425554	0712834	Kissell, E.	1987	Z	220	--	340	--
BIW 700	425634	0713134	Noyes, A.	1987	Z	250	--	260	--
BIW 704	425640	0712942	Rzasa, R.	1987	Z	230	--	220	--
BIW 713	425515	0712911	Apple Construction	1987	Z	220	--	340	--
BIW 727	425538	0712834	Woodcrest Homes	1987	Z	210	--	280	--
BIW 737	425521	0712751	Brentwood Structures	1987	Z	190	--	540	--
BIW 746	425636	0713133	Dohorty, K.	1987	Z	270	--	300	--
BIW 751	425605	0713128	Clark, B.	1987	Z	240	--	240	--
BIW 761	425600	0712747	Pine Tree Builders	1988	Z	190	--	260	--
BIW 767	425536	0712836	Rush Jr, R.	1988	Z	210	--	220	--
BIW 783	425611	0712830	Paul, V.	1988	Z	220	--	405	--
BIW 794	425455	0712752	State of NH	1988	Z	190	--	300	--
BIW 800	425513	0713250	S & G Devel Company	1987	Z	290	--	185	--
BIW 819	425603	0713035	Reo Construction	1988	Z	240	--	155	--
BIW 824	425503	0712921	Samson, C.	1988	Z	230	--	262	--
BIW 825	425501	0712912	Samson, C.	1988	Z	220	--	366	--
BIW 826	425504	0712914	Samson, C.	1988	Z	220	--	355	--
BIW 827	425502	0712921	Samson, C.	1988	Z	230	--	346	--
BIW 830	425612	0712912	Newell, T.	1987	D	240	--	16.0	--
BIW 850	425508	0713100	Melendey, L.	1989	Z	210	--	200	--
BIW 858	425714	0712925	Cotton, R.	1986	Z	240	--	305	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
				Hillsborough County--Continued						
				Bedford--Continued						
BIW 538	BEDROCK	--	--	35.0	--	20.0	09-04-86	H	20.0	NHWRD 327
BIW 542	BEDROCK	--	--	87.0	--	--	--	H	7.00	NHWRD 522
BIW 543	BEDROCK	--	--	80.0	--	--	--	H	.25	NHWRD 522
BIW 547	BEDROCK	--	--	19.0	--	15.0	05-08-86	N	12.0	NHWRD 413
BIW 559	BEDROCK	--	--	89.0	--	--	--	H	12.0	NHWRD 143
BIW 560	BEDROCK	--	--	20.0	--	10.0	10-08-86	H	15.0	NHWRD 126
BIW 561	BEDROCK	--	--	61.0	--	20.0	10-09-86	H	20.0	NHWRD 126
BIW 582	BEDROCK	--	--	100	--	--	--	H	8.50	NHWRD 327
BIW 585	BEDROCK	--	--	--	--	--	--	H	2.00	NHWRD 327
BIW 602	BEDROCK	--	--	159	--	--	--	H	3.00	NHWRD 143
BIW 609	BEDROCK	--	--	33.0	--	--	--	H	4.00	NHWRD 1
BIW 613	BEDROCK	--	--	33.0	--	--	--	H	3.00	NHWRD 1
BIW 631	BEDROCK	--	--	29.0	--	5.0	06-16-86	H	15.0	NHWRD 59
BIW 652	BEDROCK	--	--	20.0	--	--	--	H	1.00	NHWRD 104
BIW 653	BEDROCK	--	--	9.0	--	--	--	H	75.0	NHWRD 522
BIW 654	BEDROCK	--	--	86.0	--	--	--	H	30.0	NHWRD 104
BIW 658	BEDROCK	--	--	40.0	--	--	--	H	25.0	NHWRD 104
BIW 662	BEDROCK	--	--	20.0	--	20.0	03-20-87	H	8.00	NHWRD 549
BIW 665	BEDROCK	--	--	72.0	--	20.0	04-23-87	H	12.0	NHWRD 59
BIW 668	BEDROCK	--	--	80.0	--	30.0	03-30-87	H	25.0	NHWRD 327
BIW 669	BEDROCK	--	--	70.0	--	30.0	03-17-87	H	25.0	NHWRD 327
BIW 700	BEDROCK	--	--	40.0	--	10.0	06-19-87	H	20.0	NHWRD 327
BIW 704	BEDROCK	--	--	55.0	--	--	--	H	15.0	NHWRD 327
BIW 713	BEDROCK	--	--	27.0	--	5.0	05-29-87	H	8.50	NHWRD 327
BIW 727	BEDROCK	--	--	204	--	--	--	H	20.0	NHWRD 104
BIW 737	BEDROCK	--	--	19.0	--	25.0	06-24-87	H	20.0	NHWRD 413
BIW 746	BEDROCK	--	--	40.0	--	--	--	H	5.00	NHWRD 327
BIW 751	BEDROCK	--	--	19.0	--	--	--	H	25.0	NHWRD 143
BIW 761	BEDROCK	--	--	80.0	--	--	--	H	5.00	NHWRD 327
BIW 767	BEDROCK	--	--	167	--	--	--	H	30.0	NHWRD 327
BIW 783	BEDROCK	--	--	37.0	--	7.0	04-08-88	H	2.50	NHWRD 105
BIW 794	BEDROCK	--	--	99.0	--	--	--	C	10.0	NHWRD 63
BIW 800	BEDROCK	--	--	39.0	--	20.0	07-19-87	H	4.00	NHWRD 208
BIW 819	BEDROCK	--	--	24.0	--	10.0	09-08-88	H	12.0	NHWRD 126
BIW 824	BEDROCK	--	--	19.0	--	30.0	10-17-88	H	35.0	NHWRD 344
BIW 825	BEDROCK	--	--	27.0	--	22.0	10-28-88	H	5.00	NHWRD 344
BIW 826	BEDROCK	--	--	32.0	--	32.0	11-03-88	H	20.0	NHWRD 344
BIW 827	BEDROCK	--	--	19.0	--	20.0	11-21-88	H	12.0	NHWRD 344
BIW 830	112SRFD	--	--	17.0	--	3.0	07-01-87	Z	--	NHWRD 93
BIW 850	BEDROCK	--	--	39.0	--	--	--	H	30.0	NHWRD 299
BIW 858	BEDROCK	--	--	89.0	--	--	--	H	--	NHWRD 243

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Hillsborough County--Continued						
			Bedford--Continued						
BIW 860	425724	0712950	Jones, G.	1986	Z	220	--	280	--
BIW 861	425723	0712944	Garren Corporation	1986	Z	220	--	655	--
BIW 863	425716	0712928	Hawthorne Construction	1986	Z	190	--	330	--
BIW 864	425728	0712948	Roy, R.	1986	Z	230	--	355	--
BIW 866	425827	0713052	Goffstown Trucking Center	1984	C	250	--	165	--
			Deering						
DEW 3	430558	0715250	Grund	--	--	780	--	365	--
DEW 13	430630	0714942	Marcelle, V.	1984	C	900	--	193	--
DEW 27	430432	0714858	Reade, D.	1986	Z	820	--	305	--
DEW 28	430343	0714920	Pelletier, G.	1986	Z	880	--	120	--
DEW 42	430347	0714807	--	1987	Z	760	--	400	--
DEW 43	430343	0714805	Trembley, R. & C.	1987	Z	740	--	240	--
DEW 44	430345	0714806	Finn, T. & P.	1987	Z	760	--	400	--
DEW 48	430341	0714805	Perreault, J.	1988	Z	730	--	300	--
DEW 50	430505	0714824	Skoglund, W.	1988	Z	700	--	490	--
DEW 52	430341	0714810	Hill Country Associates	1988	Z	720	--	400	--
DEW 54	430339	0714813	Hill Country Associates	1988	Z	720	--	700	--
DEW 56	430337	0714804	Hill Country Associates	1988	Z	700	--	260	--
			Francestown						
FCW 1	430021	0714914	Todd	--	D	790	--	--	--
FCW 2	430039	0714941	Cilley, George	1988	--	810	14.9	14.9	--
FCW 3	425744	0714613	State of New Hampshire	1988	B	600	63	20	63
FCW 24	425728	0714557	Jordon, B.	1985	Z	600	--	383	--
FCW 25	425729	0714545	Pokornicki, S.	1986	Z	610	--	505	--
FCW 27	425745	0714511	Higgins, S.	1988	Z	600	--	220	--
FCW 34	425821	0715027	MurDough, D.	1986	Z	840	--	450	--
FCW 35	425825	0714909	Saarela, C.	1985	Z	740	--	205	--
FCW 37	425833	0715039	Linell, C.	1987	Z	860	--	340	--
FCW 38	425834	0715043	Linell, C.	1985	Z	880	--	340	--
FCW 39	425835	0714933	Weiser	1985	C	760	--	150	--
FCW 40	425845	0714932	Matthews	1987	Z	740	--	280	--
FCW 43	425854	0714935	Ludwig, T.	1987	C	780	--	120	--
FCW 44	425902	0714907	Robinson, N.	1988	C	700	--	210	--
FCW 46	425924	0714540	Margerum, G.	1984	Z	640	--	275	--
FCW 47	425927	0714832	James, R.	1986	Z	740	--	275	--
FCW 50	425932	0714932	Quinn, R.	1984	Z	960	--	240	--
FCW 54	425942	0714934	McGrath, A.	1987	Z	880	--	255	--
FCW 72	430044	0715151	Paige, G.	1985	C	980	--	203	--
FCW 73	430047	0715137	Pierson, R.	1985	Z	980	--	403	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County--Continued										
Bedford--Continued										
BIW 860	BEDROCK	--	--	103	--	--	--	H	3.50	NHWRD 243
BIW 861	BEDROCK	--	--	109	--	--	--	H	24.0	NHWRD 243
BIW 863	BEDROCK	--	--	66.0	--	--	--	H	75.0	NHWRD 243
BIW 864	BEDROCK	--	--	92.0	--	--	--	H	100	NHWRD 243
BIW 866	BEDROCK	--	--	19.0	--	7.0	10-03-84	C	20.0	NHWRD 6
Deering										
DEW 3	BEDROCK	--	--	--	--	--	--	H	.8	--
DEW 13	BEDROCK	--	--	20.0	--	--	--	H	6.00	NHWRD 113
DEW 27	BEDROCK	--	--	139	--	--	--	H	5.00	NHWRD 208
DEW 28	BEDROCK	--	--	28.0	--	--	--	H	30.0	NHWRD 63
DEW 42	BEDROCK	--	--	104	--	--	--	H	2.00	NHWRD 249
DEW 43	BEDROCK	--	--	96.0	--	--	--	H	6.00	NHWRD 249
DEW 44	BEDROCK	--	--	99.0	--	--	--	H	4.00	NHWRD 249
DEW 48	BEDROCK	--	--	88.0	--	--	--	H	2.50	NHWRD 249
DEW 50	BEDROCK	--	--	119	--	--	--	H	5.00	NHWRD 1
DEW 52	BEDROCK	--	--	99.0	--	--	--	H	2.75	NHWRD 249
DEW 54	BEDROCK	--	--	140	--	--	--	H	1.75	NHWRD 249
DEW 56	BEDROCK	--	--	60.0	--	--	--	H	2.75	NHWRD 249
Francestown										
FCW 1	110SDMN	--	--	--	--	2.27	05-23-88	U	--	--
FCW 2	110SDMN	--	--	--	--	11.0	05-23-88	H	--	--
FCW 3	112SRFD	2	--	17.5	17.5	13.5	12-06-88	U	--	USGS
FCW 24	BEDROCK	--	--	150	--	--	--	H	15.0	NHWRD 315
FCW 25	BEDROCK	--	--	144	--	8.0	10-08-86	H	1.00	NHWRD 104
FCW 27	BEDROCK	--	--	69.0	--	20.0	04-01-88	H	10.0	NHWRD 413
FCW 34	BEDROCK	--	--	17.0	--	--	--	H	8.00	NHWRD 641
FCW 35	BEDROCK	--	--	106	--	--	--	H	6.00	NHWRD 1
FCW 37	BEDROCK	--	--	119	--	40.0	09-18-87	H	100	NHWRD 63
FCW 38	BEDROCK	--	--	109	--	28.0	10-17-85	H	100	NHWRD 63
FCW 39	BEDROCK	--	--	19.0	--	10.0	12-20-85	H	25.0	NHWRD 548
FCW 40	BEDROCK	--	--	81.0	--	--	--	H	12.0	NHWRD 327
FCW 43	BEDROCK	--	--	20.0	--	8.0	12-03-87	H	15.0	NHWRD 128
FCW 44	BEDROCK	--	--	139	--	20.0	06-27-88	H	8.00	NHWRD 128
FCW 46	BEDROCK	--	--	69.0	--	50.0	07-12-84	H	4.00	NHWRD 315
FCW 47	BEDROCK	--	--	70.0	--	25.0	09-25-86	H	11.0	NHWRD 315
FCW 50	BEDROCK	--	--	119	--	--	--	H	10.0	NHWRD 249
FCW 54	BEDROCK	--	--	51.0	--	--	--	H	25.0	NHWRD 104
FCW 72	BEDROCK	--	--	20.0	--	3.0	03-19-85	H	2.00	NHWRD 548
FCW 73	BEDROCK	--	--	16.0	--	--	--	H	2.00	NHWRD 315

Local site number		Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
Hillsborough County--Continued										
Francestown--Continued										
FCW	77	425940	0714845	Caskie	1947	--	800	--	58	--
FCW	79	425910	0714818	Dodge, W.C.	1960	--	700	--	100	--
FCW	81	425901	0714820	Ellis, C.G.	1961	--	720	--	370	--
FCW	82	425902	0714831	Freeze, C.	1961	--	750	--	95	--
FCW	87	425910	0714805	Hopkins, M.G.	1959	--	770	--	106	--
FCW	89	425913	0714832	Ireland, J.W.	1964	--	860	--	105	--
FCW	91	425837	0714917	Kundhart	1957	--	750	--	295	--
FCW	97	425904	0714807	Maretti, T.V.	1961	--	730	--	126	--
FCW	99	425823	0714743	Nutting and Abbott	1957	--	690	--	292	--
FCW	103	425907	0714831	Whittimore, R.E.	1960	--	760	--	105	--
FCW	104	425910	0714814	Wiggin	1950	--	730	--	135	--
FCW	105	425804	0714726	Woodworth	1955	--	700	--	130	--
Goffstown										
GNA	1	430104	0713639	Haefield, J.	1988	B	300	15	--	15
GNA	3	430103	0713621	Goffstown, Town of	1988	B	300	20	--	19
GNB	1	430100	0713259	NH Department of Transportation	1936	--	180	14	--	14
GNB	2	430058	0713300	NH Department of Transportation	1936	--	180	8	--	--
GNB	3	430129	0713746	NH Department of Transportation	1972	--	300	25	--	--
GNB	4	430125	0713318	NH Department of Transportation	1972	--	240	9	--	--
GNW	1	430120	0713703	Goffstown Water Precinct	1956	--	300	--	40.0	--
GNW	2	430117	0713702	Goffstown Water Precinct	1956	--	300	41	41	--
GNW	4	430118	0713702	Goffstown Water Precinct	1988	B	300	44	40	44
GNW	5	430118	0713702	Goffstown Water Precinct	1988	B	300	44	10	--
GNW	6	430118	0713700	Goffstown Water Precinct	1988	B	300	40	10	--
GNW	7	430118	0713700	Goffstown Water Precinct	1988	B	300	40	30	40
GNW	8	430117	0713709	Goffstown Water Precinct	1988	B	300	39	30	39
GNW	9	430117	0713705	Goffstown Water Precinct	1988	B	300	33	30	--
GNW	14	430118	0713742	Parker, Heather	1988	B	300	66	55	66
GNW	15	430112	0713655	Haefield, J.	1988	B	290	54.5	40	55
GNW	16	430111	0713720	Schricker	1988	B	310	49	30	49
GNW	17	430137	0713810	Goffstown, Town of	1988	B	310	62	50	--
GNW	18	430120	0713618	Barnard, R.	1957	--	310	--	93	--
GNW	19	430055	0713600	Karanikas	1960	--	310	--	375	--
GNW	20	425949	0713052	Wenzelight	1962	--	330	--	200	--
GNW	21	425952	0713057	Therrien	1962	--	320	--	102	--
GNW	22	430111	0713251	Tarr, D.	1960	--	250	--	226	--
GNW	23	430009	0713037	Sprague, W.	1960	--	170	--	147	--
GNW	24	430043	0713016	Santos, J.	1958	--	300	--	92	--
GNW	25	430113	0713326	Graham, J.	1961	--	300	--	102	--
GNW	27	430108	0713526	Belair, I.	1960	--	310	--	100	--

Local site number		Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
					Hillsborough County--Continued						
					Francestown--Continued						
FCW	77	BEDROCK	--	--	31	--	6.5	-- -47	H	--	R.E.Chapman
FCW	79	BEDROCK	--	--	56	--	4	03- -60	H	--	McKenna, J.
FCW	81	BEDROCK	--	--	--	--	40	03- -61	H	--	McKenna, J.
FCW	82	BEDROCK	--	--	--	--	4	04- -61	H	--	McKenna, J.
FCW	87	BEDROCK	--	--	42	--	1	08- -59	H	--	McKenna, J.
FCW	89	BEDROCK	--	--	85	--	15	04- -64	H	--	McKenna, J.
FCW	91	BEDROCK	--	--	226	--	70	-- -57	H	--	R.E.Chapman
FCW	97	BEDROCK	--	--	--	--	10	04- -61	H	--	McKenna, J.
FCW	99	BEDROCK	--	--	16	--	20	08-06-57	H	--	A and B
FCW	103	BEDROCK	--	--	63	--	12	04- -60	H	--	McKenna, J.
FCW	104	BEDROCK	--	--	86	--	14	-- -50	H	--	R.E.Chapman
FCW	105	BEDROCK	--	--	104	--	70	-- -55	H	--	R.E.Chapman
					Goffstown						
GNA	1	112SRFD	--	--	--	--	--	--	U	--	USGS
GNA	3	112SRFD	--	--	--	--	--	--	U	--	USGS
GNB	1	--	--	--	--	--	--	--	--	--	--
GNB	2	--	--	--	--	--	--	--	--	--	--
GNB	3	--	--	--	--	--	--	--	--	--	--
GNB	4	--	--	--	--	--	--	--	--	--	--
GNW	1	112OTSH	10.0	S	30	30.0	10.0	09-01-56	P	190	Hancock
GNW	2	112SRFD	12	S	30	30.2	--	--	P	350	Hancock
GNW	4	112SRFD	2	--	37.5	37.5	.54	--	U	--	USGS
GNW	5	112SRFD	2	--	7.5	--	.88	06-06-88	U	--	USGS
GNW	6	112SRFD	2	--	7.5	--	1.11	06-06-88	U	--	USGS
GNW	7	112SRFD	2	--	27.5	27.5	2.28	06-06-88	U	--	USGS
GNW	8	112SRFD	2	--	27.5	27.5	.56	06-06-88	U	--	USGS
GNW	9	112SRFD	2	--	27.5	27.5	.65	06-06-88	U	--	USGS
GNW	14	112SRFD	2	--	50.0	50	4.02	12-06-88	U	--	USGS
GNW	15	112SRFD	2	--	37.5	37.5	6.38	12-06-88	U	--	USGS
GNW	16	112SRFD	2	--	27.5	27.5	14.1	12-06-88	U	--	USGS
GNW	17	112SRFD	2	--	47.5	47.5	19.3	12-06-88	U	--	USGS
GNW	18	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW	19	BEDROCK	--	--	38	--	--	--	--	--	Pattenaude
GNW	20	BEDROCK	--	--	98	--	--	--	--	--	Dube, R.
GNW	21	BEDROCK	--	--	43	--	--	--	--	--	Kosiba, S.
GNW	22	BEDROCK	--	--	21	--	--	--	--	--	Dube, R.
GNW	23	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW	24	BEDROCK	--	--	22	--	--	--	--	--	Dube, R.
GNW	25	BEDROCK	--	--	--	--	20	-- -61	--	--	Chandler
GNW	27	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Hillsborough County--Continued						
			Goffstown--Continued						
GNW 28	430106	0713259	Thibeault	1962	--	190	--	75	--
GNW 29	430031	0713111	Chatel	1959	--	170	--	101	--
GNW 30	430057	0713053	Langan, J.G.	1959	--	290	--	151	--
GNW 32	430023	0713035	Pinard, N.	1961	--	220	--	117	--
GNW 35	430023	0713123	Caron, I.	1962	--	280	--	102	--
GNW 37	430020	0713027	Coulon, D.	1947	--	330	--	214	--
GNW 38	425951	0713022	Eastman, S.	1958	--	270	--	200	--
GNW 39	425918	0712958	Gentis, A.	1953	--	100	--	100	--
GNW 40	430055	0713629	McKin, E.C.	1946	--	340	--	243	--
GNW 41	430007	0713057	Lussier, L.	1953	--	280	--	90	--
GNW 72	430042	0713121	Martin, M.	1984	Z	180	--	100	--
GNW 75	430043	0713419	Auger, J.	1984	C	310	--	290	--
GNW 78	430009	0713036	Gilbert, M.	1984	Z	190	--	305	--
GNW 95	430009	0713038	Scarlett Homes Incorporated	1986	Z	140	--	295	--
GNW 113	430058	0713109	Burbutsina	1985	Z	280	--	625	--
GNW 122	430049	0713138	LaFrancois, L.	1986	Z	170	--	100	--
GNW 176	430038	0713120	Lizotte, R.	1986	Z	180	--	202	--
GNW 184	430046	0713145	McMaster, R.	1986	Z	170	--	355	--
GNW 204	430050	0713226	Genest, D.	1986	Z	180	--	185	--
GNW 212	430143	0713031	Harrington, S.	1987	Z	300	--	305	--
GNW 241	430055	0713407	Palito Construction	1987	Z	300	--	270	--
GNW 242	430032	0713219	Town of Goffstown	1987	Z	300	--	255	--
GNW 255	425859	0712952	Isabelle, B.	1987	Z	300	--	600	--
			Greenfield						
GSW 35	425650	0715052	Peterson, W.	1985	Z	860	--	576	--
GSW 40	425649	0715055	D'Alessandro, P.	1985	Z	860	--	300	--
GSW 61	425621	0714917	Woodbury, P.	1986	Z	940	--	500	--
GSW 66	425619	0714916	McCormack, J.	1987	Z	920	--	200	--
GSW 101	425508	0715038	Greenfield, Town of	1988	B	840	47	35	35
GSW 102	425729	0715031	Cowles, W.	1961	--	830	--	200	--
GSW 104	425654	0715107	Blaha	1962	--	950	--	210	--
GSW 105	425730	0715151	Magoon, F.	1964	--	840	--	145	--
GSW 106	425737	0715143	Peterson, G.	1953	--	840	--	107	--
GVB 1	424634	0714824	N.H. Public Works Highway	1900	--	750	19	--	--
GVB 10	424644	0714834	Greenville, Town of	1915	D	740	18	18	--
			Manchester						
MCB 1	430014	0712817	NH Department of Transportation	1967	--	190	--	--	--
MCB 2	430011	0712809	NH Department of Transportation	1967	--	170	10	--	--
MCB 3	425626	0712627	NH Department of Transportation	1947	--	240	37	--	--
MCB 4	425736	0712504	NH Department of Transportation	1934	--	200	18	--	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County--Continued										
Goffstown--Continued										
GNW 28	BEDROCK	--	--	--	--	0	-- -62	--	--	Chandler
GNW 29	BEDROCK	--	--	60	--	27	12- -59	--	--	Fischer
GNW 30	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW 32	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW 35	BEDROCK	--	--	47	--	--	--	--	--	Dube, O.
GNW 37	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW 38	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW 39	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW 40	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW 41	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
GNW 72	BEDROCK	--	--	39.0	--	--	--	H	50.0	NHWRD 299
GNW 75	BEDROCK	--	--	39.0	--	--	--	H	6.00	NHWRD 532
GNW 78	BEDROCK	--	--	79.0	--	10.0	11-20-84	H	20.0	NHWRD 63
GNW 95	BEDROCK	--	--	81.0	--	--	--	H	4.00	NHWRD 1
GNW 113	BEDROCK	--	--	144	--	80.0	10-23-85	H	1.00	NHWRD 549
GNW 122	BEDROCK	--	--	41.0	--	6.0	03-06-86	H	60.0	NHWRD 549
GNW 176	BEDROCK	--	--	39.0	--	--	--	H	30.0	NHWRD 406
GNW 184	BEDROCK	--	--	45.0	--	--	--	H	15.0	NHWRD 327
GNW 204	BEDROCK	--	--	19.0	--	--	--	H	50.0	NHWRD 522
GNW 212	BEDROCK	--	--	34.0	--	--	--	H	8.00	NHWRD 549
GNW 241	BEDROCK	--	--	96.0	--	40.0	06-19-87	H	20.0	NHWRD 104
GNW 242	BEDROCK	--	--	34.0	--	30.0	08-31-87	C	25.0	NHWRD 104
GNW 255	BEDROCK	--	--	35.0	--	--	--	H	3.00	NHWRD 1
Greenfield										
GSW 35	BEDROCK	--	--	232	--	--	--	H	3.00	NHWRD 3
GSW 40	BEDROCK	--	--	252	--	--	--	H	1.00	NHWRD 62
GSW 61	BEDROCK	--	--	121	--	--	--	H	.50	NHWRD 641
GSW 66	BEDROCK	--	--	44.0	--	30.0	09-13-87	H	6.00	NHWRD 126
GSW 101	112SRFD	2	--	32.5	32.5	8.87	12-06-88	U	--	USGS
GSW 102	BEDROCK	--	--	--	--	45	06- -61	H	--	McKenna, J.
GSW 104	BEDROCK	--	--	140	--	45	01- -62	H	--	McKenna, J.
GSW 105	BEDROCK	--	--	90	--	20	06- -64	H	--	McKenna, J.
GSW 106	BEDROCK	--	--	39	--	--	--	H	--	Wheeler, D.
GVB 1	--	--	--	--	--	--	--	U	--	00
GVB 10	110SDMN	30	R	18	--	--	--	N	40	--
Manchester										
MCB 1	--	--	--	--	--	--	--	--	--	--
MCB 2	--	--	--	--	--	--	--	--	--	--
MCB 3	--	--	--	--	--	--	--	--	--	--
MCB 4	--	--	--	--	--	--	--	--	--	--

Hillsborough County--Continued

Manchester--Continued

Local site number		Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
MCB	6	425939	0712808	NH Department of Transportation	1939	--	130	35	--	35
MCB	7	425939	0712759	NH Department of Transportation	1936	--	170	20	--	20
MCB	9	425937	0712504	NH Department of Transportation	1960	--	340	23	--	--
MCB	10	425831	0712821	NH Department of Transportation	1955	--	140	42	--	42
MCB	12	425839	0712817	NH Department of Transportation	1955	--	120	52	--	52
MCB	13	425835	0712818	NH Department of Transportation	1955	--	120	40	--	40
MCB	14	425904	0712816	NH Department of Transportation	1956	--	150	46	--	--
MCB	15	430008	0712833	NH Department of Transportation	1956	--	160	60	--	60
MCB	16	430018	0712833	NH Department of Transportation	1956	--	230	90	--	--
MCB	17	425821	0712829	NH Department of Transportation	1954	--	140	34	--	34
MCB	18	425822	0712830	NH Department of Transportation	1954	--	130	35	--	35
MCB	19	425845	0712815	NH Department of Transportation	1955	--	150	60	--	60
MCB	20	430035	0712838	NH Department of Transportation	1954	--	170	36	--	36
MCB	21	430054	0712858	NH Department of Transportation	1954	--	180	25	--	25
MCB	22	430055	0712855	NH Department of Transportation	1954	--	230	58	--	--
MCB	23	430213	0712900	NH Department of Transportation	1954	--	270	57	--	--
MCB	24	430044	0712842	NH Department of Transportation	1954	--	180	22	--	22
MCB	25	425712	0712642	NH Department of Transportation	1958	--	240	38	--	38
MCB	26	425714	0712642	NH Department of Transportation	1958	--	250	27	--	27
MCB	27	425731	0712434	NH Department of Transportation	1962	--	210	62	--	--
MCB	29	425741	0712509	NH Department of Transportation	1960	--	240	2	--	--
MCB	38	430227	0712741	NH Department of Transportation	1975	--	189	54	--	--
MCB	39	430225	0712736	NH Department of Transportation	1975	--	195	33	--	33
MCB	40	425716	0712412	NH Department of Transportation	1962	--	227	31	--	--
MCB	41	425714	0712409	NH Department of Transportation	1962	--	207	22	--	22
MCB	42	425639	0712324	NH Department of Transportation	1962	--	214	34	--	34
MCB	43	425657	0712716	NH Department of Transportation	1958	--	164	46	--	--
MCB	44	425724	0712612	NH Department of Transportation	1960	--	258	24	--	24
MCB	45	425733	0712543	NH Department of Transportation	1960	--	238	57	--	--
MCB	46	425743	0712455	NH Department of Transportation	1961	--	224	9	--	--
MCB	47	425733	0712427	NH Department of Transportation	1962	--	202	52	--	52
MCB	48	430229	0712744	NH Department of Transportation	1975	--	177	40	--	40
MCB	49	425938	0712942	NH Department of Transportation	1973	--	154	29	--	29
MCB	50	425740	0712410	NH Department of Transportation	1961	--	224	17	--	17
MCB	51	425805	0712450	NH Department of Transportation	1961	--	257	4	--	--
MCB	52	425933	0712949	NH Department of Transportation	1973	--	220	68	--	68
MCB	53	425939	0712939	NH Department of Transportation		--	184	10	--	--
MCB	54	425917	0712457	NH Department of Transportation	1961	--	324	17	--	--
MCB	55	425935	0712946	NH Department of Transportation	1973	--	138	21	--	21
MCB	58	425902	0712459	NH Department of Transportation	1978	--	351	26	--	26
MCB	59	425903	0712456	NH Department of Transportation	1978	--	360	30	--	30

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County--Continued										
Manchester--Continued										
MCB 6	--	--	--	--	--	--	--	--	--	--
MCB 7	--	--	--	--	--	--	--	--	--	--
MCB 9	--	--	--	--	--	--	--	--	--	--
MCB 10	--	--	--	--	--	--	--	--	--	--
MCB 12	--	--	--	--	--	--	--	--	--	--
MCB 13	--	--	--	--	--	--	--	--	--	--
MCB 14	--	--	--	--	--	--	--	--	--	--
MCB 15	--	--	--	--	--	--	--	--	--	--
MCB 16	--	--	--	--	--	--	--	--	--	--
MCB 17	--	--	--	--	--	--	--	--	--	--
MCB 18	--	--	--	--	--	--	--	--	--	--
MCB 19	--	--	--	--	--	--	--	--	--	--
MCB 20	--	--	--	--	--	--	--	--	--	--
MCB 21	--	--	--	--	--	--	--	--	--	--
MCB 22	--	--	--	--	--	--	--	--	--	--
MCB 23	--	--	--	--	--	--	--	--	--	--
MCB 24	--	--	--	--	--	--	--	--	--	--
MCB 25	--	--	--	--	--	--	--	--	--	--
MCB 26	--	--	--	--	--	--	--	--	--	--
MCB 27	--	--	--	--	--	--	--	--	--	--
MCB 29	--	--	--	--	--	--	--	--	--	--
MCB 38	--	--	--	--	--	--	--	--	--	--
MCB 39	--	--	--	--	--	--	--	--	--	--
MCB 40	--	--	--	--	--	--	--	--	--	--
MCB 41	--	--	--	--	--	--	--	--	--	--
MCB 42	--	--	--	--	--	--	--	--	--	--
MCB 43	--	--	--	--	--	--	--	--	--	--
MCB 44	--	--	--	--	--	--	--	--	--	--
MCB 45	--	--	--	--	--	--	--	--	--	--
MCB 46	--	--	--	--	--	--	--	--	--	--
MCB 47	--	--	--	--	--	--	--	--	--	--
MCB 48	--	--	--	--	--	--	--	--	--	--
MCB 49	--	--	--	--	--	15	-- -73	--	--	--
MCB 50	--	--	--	--	--	--	--	--	--	--
MCB 51	--	--	--	--	--	--	--	--	--	--
MCB 52	--	--	--	--	--	--	--	--	--	--
MCB 53	--	--	--	--	--	--	--	--	--	--
MCB 54	--	--	--	--	--	--	--	--	--	--
MCB 55	--	--	--	--	--	--	--	--	--	--
MCB 58	--	--	--	--	--	--	--	--	--	--
MCB 59	--	--	--	--	--	--	--	--	--	--

Local site number		Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
				Hillsborough County--Continued						
				Manchester--Continued						
MCW	3	425608	0712502	Pinard, A. J.	1900	D	210	15	15	--
MCW	6	430051	0712914	Manchester, City of	1985	--	267	61	61	--
MCW	7	430057	0712858	Manchester, City of	1985	--	195	20.5	15	--
MCW	8	430104	0712907	Manchester, City of	1985	--	238	34	34	--
MCW	9	430107	0712911	Manchester, City of	1985	--	258	33	33	--
MCW	10	430109	0712928	Manchester, City of	1985	--	297	55	32	--
MCW	11	430102	0712919	Manchester, City of	1985	--	313	91	91	--
MCW	19	425652	0712358	American Albanian Association	1951	--	100	--	204	--
MCW	20	425925	0712521	Bartlett, G.	1961	--	100	--	102	--
MCW	21	425900	0712525	Barton, C.	1955	--	100	--	128	--
MCW	22	425955	0712920	Bilodeau, A.	1958	--	100	--	100	--
MCW	24	425746	0712410	Boisvert, L.	1962	--	100	--	205	--
MCW	26	430103	0712959	Boivert, N.	1961	--	100	--	150	--
MCW	27	430025	0712930	Boudreau, R.	1960	--	100	--	102	--
MCW	28	430033	0712938	Boudreau, W.	1958	--	100	--	75	--
MCW	29	430026	0712853	Boulanger, L.	1958	--	100	--	75	--
MCW	31	425715	0712703	Brazian, M.	--	--	100	--	192	--
MCW	32	425903	0712915	Caron, G.	1948	--	100	--	74	--
MCW	33	425643	0712503	Caron, M.	--	--	100	--	208	--
MCW	34	425934	0712922	Chouinard, R.	1962	--	100	--	102	--
MCW	36	425858	0712539	Colitas, G.	1962	--	100	--	304	--
MCW	37	430129	0713018	Cronin, J.	1963	--	300	--	100	--
MCW	38	430217	0712910	Demers, L.	1960	--	100	--	100	--
MCW	39	425913	0712854	Duford, A.	1948	--	100	--	110	--
MCW	40	430007	0712901	Gooselin, R.	1962	--	100	--	150	--
MCW	43	430035	0712940	Houle, E.	1960	--	100	--	76	--
MCW	46	425907	0712609	Jaskolka, E.	1953	--	100	--	160	--
MCW	47	425610	0712446	Kelly, A.	1961	--	100	--	66	--
MCW	48	430032	0712358	Koch, W.	0000	--	100	--	--	--
MCW	49	430222	0712907	Landry, H.	1953	--	100	--	90	--
MCW	51	425932	0712349	McGuire, P.	1958	--	100	--	110	--
MCW	53	430127	0712808	Morrison, E.	1953	--	100	--	159	--
MCW	54	430001	0712407	Nokt, A.	1958	--	100	--	130	--
MCW	55	425752	0712338	Opanowski, N.	1950	--	100	--	88	--
MCW	58	425945	0712442	Rockefort, E.	1962	--	100	--	460	--
MCW	60	430026	0712952	Sevigny, R.	1960	--	100	--	113	--
MCW	61	430037	0712950	Simond, H.	1963	--	100	--	128	--
MCW	62	425730	0712456	Sroka, J.	1961	--	100	--	51	--
MCW	63	425945	0712427	St. Germain, P.	1956	--	100	--	100	--
MCW	64	425947	0712838	St. Pierre, E.	1952	--	100	--	141	--
MCW	65	425809	0712600	Theberge, E.	1963	--	100	--	110	--

wells and borings--Continued

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County--Continued										
Manchester--Continued										
MCW 3	112OTSH	--	--	--	--	8.13	08-14-68	H	--	--
MCW 6	110SDMN	--	--	--	--	48	02-28-85	--	--	--
MCW 7	--	--	--	--	--	6	02-28-85	U	--	--
MCW 8	112SRFD	--	--	--	--	23	02-28-85	U	--	--
MCW 9	112SRFD	--	--	--	--	18	02-28-85	U	--	--
MCW 10	112SRFD	--	--	--	--	13	02-28-85	U	--	--
MCW 11	112SRFD	--	--	--	--	60	02-28-85	U	--	--
MCW 19	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 20	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 21	BEDROCK	--	--	--	--	--	--	--	--	
MCW 22	BEDROCK	--	--	12	--	--	--	--	--	Dube, R.
MCW 24	BEDROCK	--	--	9	--	--	--	--	--	Dube, R.
MCW 26	BEDROCK	--	--	8	--	--	--	--	--	Dube, R.
MCW 27	BEDROCK	--	--	22	--	--	--	--	--	Dube, R.
MCW 28	BEDROCK	--	--	29	--	--	--	--	--	Dube, R.
MCW 29	BEDROCK	--	--	--	--	--	--	--	--	Daniels
MCW 31	BEDROCK	--	--	38	--	30	00-00-	--	--	A and B
MCW 32	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 33	BEDROCK	--	--	39	--	--	--	--	--	Dube, R.
MCW 34	BEDROCK	--	--	33	--	--	--	--	--	Dube, R.
MCW 36	BEDROCK	--	--	36	--	--	--	--	--	Dube, R.
MCW 37	BEDROCK	--	--	26	--	--	--	--	--	Dube, R.
MCW 38	BEDROCK	--	--	11	--	--	--	--	--	Patenaude
MCW 39	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 40	BEDROCK	--	--	--	--	52	-- -62	--	--	Chandler
MCW 43	BEDROCK	--	--	27	--	--	--	--	--	Dube, R.
MCW 46	BEDROCK	--	--	18	--	8	06-06-53	--	--	A and B
MCW 47	BEDROCK	--	--	64	--	10	09-07-61	--	--	Tasker
MCW 48	BEDROCK	--	--	44	--	--	--	--	--	Dube, O.
MCW 49	BEDROCK	--	--	31	--	12	06-18-53	--	--	A and B
MCW 51	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 53	BEDROCK	--	--	55	--	40	-- -53	--	--	Wheeler, D.
MCW 54	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 55	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 58	BEDROCK	--	--	21	--	28	01-12-62	--	--	A and B
MCW 60	BEDROCK	--	--	25	--	10	08- -60	--	--	Patenaude
MCW 61	BEDROCK	--	--	30	--	--	--	--	--	Dube, R.
MCW 62	BEDROCK	--	--	34	--	2	06- -61	--	--	Fischer
MCW 63	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 64	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
MCW 65	BEDROCK	--	--	60	--	--	--	--	--	Dube, R.

Local site number		Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
Hillsborough County--Continued										
Manchester--Continued										
MCW	66	430008	0712846	Therrein, D.	1962	--	100	--	209	--
MCW	67	425906	0712627	Tuttle, F.	1960	--	100	--	98	--
MCW	68	425813	0712646	York, F.	1961	--	100	--	70	--
MCW	69	430018	0712843	Zindt, A.	1961	--	100	--	25	--
MCW	70	425627	0712523	Mars	1965	--	100	--	200	--
MCW	72	430208	0712834	Gaudbout, M.	1984	Z	190	--	325	--
MCW	73	430055	0712921	City of Manchester	1985	Z	260	--	56.0	--
MCW	74	430050	0712909	City of Manchester	1985	Z	260	--	61.0	--
MCW	75	430108	0712927	City of Manchester	1985	Z	280	--	55.0	--
MCW	76	430103	0712906	City of Manchester	1985	Z	230	--	34.0	--
MCW	79	430149	0713031	Auger, P.	1984	Z	310	--	165	--
MCW	80	430101	0713005	Henry's Auto Body Inc	1985	Z	290	--	235	--
MCW	83	430207	0712835	Boucher, L.	1986	Z	190	--	380	--
MCW	85	425946	0712445	Jean, B.	1986	Z	370	--	240	--
MCW	88	425824	0712807	Corporate Environ Advisor	1987	Z	200	--	20.0	--
MCW	91	425756	0712703	United Truck Leasing	1988	Z	250	--	22.0	--
MCW	94	425754	0712701	United Truck Leasing	1988	Z	250	--	22.0	--
MCW	97	425731	0712646	Public Service Co. of New Hampsh	1988	Z	245	--	10.0	--
MCW	98	425733	0712647	Public Service Co. of New Hampsh	1988	Z	245	--	10.0	--
MCW	101	425929	0712357	City of Manchester	1988	Z	280	--	220	--
Mason										
MGA	1	424604	0714522	Mason, Town of	1988	B	600	19	--	19
MGW	1	424423	0714252	Mason, Town of	1988	B	375	43.5	32	44
MGW	4	424341	0714551	Wildus, Leland	1951	--	440	265	12	--
MGW	5	424328	0714543	Adshead	1952	--	420	188	24	--
MGW	6	424334	0714549	Basset, Dean	1956	--	430	80	--	--
MGW	7	424355	0714549	Dunham	1950	--	480	86	13	--
MGW	31	424239	0714510	Dickerson, J.	1986	Z	400	--	720	--
MGW	32	424558	0714441	Farnham, S.	1986	Z	660	--	300	--
MGW	35	424621	0714513	Spanos, J. & D.	1986	Z	660	--	220	--
MGW	36	424629	0714523	Collardeau, S. & L.	1986	Z	660	--	260	--
MGW	37	424559	0714445	Michaud, D.	1986	Z	660	--	320	--
MGW	38	424626	0714515	Higgins, G. & Ludden, L.	1986	Z	660	--	260	--
MGW	39	424620	0714510	Roberts, D. & M.	1986	Z	640	--	320	--
MGW	40	424623	0714515	Madden, K. & D.	1986	Z	660	--	220	--
MGW	42	424300	0714539	Lam, H.	1986	Z	400	--	405	--
MGW	45	424543	0714331	JEC Construction	1987	Z	580	--	305	--
MGW	47	424543	0714334	JEC Construction	1987	Z	600	--	805	--
MGW	50	424425	0714311	Bogatkauski, R.	1986	Z	480	--	300	--
MGW	58	424627	0714506	Laurendeau, J.	1987	Z	620	--	285	--

Local site number		Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
					Hillsborough County--Continued						
					Manchester--Continued						
MCW	66	BEDROCK	--	--	44	--	--	--	--	--	Dube, R.
MCW	67	BEDROCK	--	--	32	--	28	08-12-60	--	--	A and B
MCW	68	BEDROCK	--	--	10	--	10	11- -61	--	--	Caverly, M.
MCW	69	BEDROCK	--	--	15	--	5	07-30-61	--	--	Kosiba, S.
MCW	70	BEDROCK	--	--	--	--	--	--	--	--	A and B
MCW	72	BEDROCK	--	--	21.0	--	50.0	06-27-84	H	100	NHWRD 549
MCW	73	112SRFD	--	--	41.0	--	41.0	01-24-85	U	--	NHWRD 354
MCW	74	112SRFD	--	--	45.0	--	42.5	01-24-85	U	--	NHWRD 354
MCW	75	BEDROCK	--	--	14.0	--	16.0	01-25-85	U	--	NHWRD 354
MCW	76	BEDROCK	--	--	21.0	--	--	--	U	--	NHWRD 354
MCW	79	BEDROCK	--	--	20.0	--	--	--	H	9.00	NHWRD 192
MCW	80	BEDROCK	--	--	30.0	--	--	--	H	15.0	NHWRD 1
MCW	83	BEDROCK	--	--	44.0	--	--	--	H	75.0	NHWRD 1
MCW	85	BEDROCK	--	--	20.0	--	--	--	H	7.50	NHWRD 327
MCW	88	BEDROCK	--	--	19.0	--	11.0	12-03-87	U	--	NHWRD 100
MCW	91	112SRFD	--	--	--	--	20.0	03-24-88	U	--	NHWRD 128
MCW	94	112SRFD	--	--	--	--	21.0	03-24-88	U	--	NHWRD 128
MCW	97	112SRFD	--	--	--	--	6.3	09-20-88	U	--	NHWRD 137
MCW	98	112SRFD	--	--	--	--	5.3	09-20-88	U	--	NHWRD 137
MCW	101	BEDROCK	--	--	39.0	--	--	--	H	20.0	NHWRD 327
					Mason						
MGA	1	112SRFD	--	--	--	--	--	--	--	--	USGS
MGW	1	112SRFD	2	--	30.0	30	7.59	12-06-88	U	--	USGS
MGW	4	--	--	--	--	--	--	--	H	--	Wheeler
MGW	5	--	--	--	--	--	12	-- -52	H	--	Wheeler
MGW	6	--	--	--	--	--	10	-- -56	H	--	McKenna
MGW	7	--	--	--	--	--	--	--	H	--	Wheeler
MGW	31	BEDROCK	--	--	40.0	--	--	--	H	.25	327
MGW	32	BEDROCK	--	--	20.0	--	25.0	05-16-86	H	10.0	325
MGW	35	BEDROCK	--	--	39.0	--	--	--	H	10.0	343
MGW	36	BEDROCK	--	--	59.0	--	--	--	H	6.00	343
MGW	37	BEDROCK	--	--	19.0	--	--	--	H	2.00	343
MGW	38	BEDROCK	--	--	39.0	--	--	--	H	5.00	343
MGW	39	BEDROCK	--	--	39.0	--	--	--	H	12.0	343
MGW	40	BEDROCK	--	--	49.0	--	--	--	H	10.0	343
MGW	42	BEDROCK	--	--	44.0	--	15.0	05-21-86	H	6.00	104
MGW	45	BEDROCK	--	--	20.0	--	12.0	03-31-87	H	8.00	325
MGW	47	BEDROCK	--	--	20.0	--	10.0	03-24-87	H	3.00	325
MGW	50	BEDROCK	--	--	114	--	60.0	10-24-86	H	5.00	413
MGW	58	BEDROCK	--	--	19.0	--	42.0	10-10-87	H	10.0	343

Local site number		Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
				Hillsborough County--Continued						
				Mason--Continued						
MGW	65	424617	0714524	Devore, D.	1988	Z	620	--	320	--
				New Boston						
NCA	1	425615	0714409	State of New Hampshire	1988	B	530	97	--	97
NCA	8	425809	0714414	--	1988	B	530	60	--	--
NCA	10	425735	0714203	New Boston, Town of	1988	B	530	14	--	14
NCA	99	430058	0713816	State of New Hampshire	1988	B	290	15	--	--
NCB	1	430051	0713831	NH Department of Transportation	1937	--	290	18	--	--
NCB	2	425757	0714402	--	--	--	622	35.5	--	--
NCB	3	425752	0714358	--	--	--	601	28	--	--
NCB	4	425750	0714359	--	--	--	600	28	--	--
NCB	5	425751	0714402	--	--	--	597	31	--	--
NCW	4	425915	0714020	Berger, A.	1900	D	380	4.5	4.5	--
NCW	5	425830	0714133	New Boston, Town of	1949	C	470	100	100	--
NCW	8	425705	0714209	New Boston, Town of	1988	B	560	83	50	84
NCW	40	425832	0714128	Daniels Inc	1985	Z	430	--	550	--
NCW	42	425924	0714457	Pike, B.	1988	Z	--	--	450	--
NCW	55	430056	0713803	Wilkins, J.	1985	Z	340	--	150	--
NCW	59	430057	0713809	Belanger, A.	1985	Z	340	--	355	--
NCW	60	425948	0714345	Todd Jr, R.	1985	Z	600	--	330	--
NCW	76	430046	0714450	Bower, R.	1986	Z	600	--	393	--
NCW	87	425840	0714134	Lanzillotti, L.	1986	Z	440	--	405	--
NCW	93	425835	0714131	Dodge, H.	1986	Z	430	--	285	--
NCW	103	430118	0714109	Agri, P.	1986	Z	380	--	32.0	--
NCW	104	430043	0714246	Gordon, L.	1986	Z	530	--	400	--
NCW	105	430153	0713842	Broderick, M.	1986	Z	310	--	305	--
NCW	112	430055	0713834	Daragon, J.	1987	Z	340	--	402	--
NCW	114	430116	0714114	Jenkins, M.& Shaw, J.	1987	Z	380	--	570	--
NCW	123	425832	0714125	Gagnon Enterprises	1987	Z	450	--	245	--
NCW	127	430049	0713941	Poland, R.	1987	Z	440	--	300	--
NCW	129	430058	0713921	Smith, D.	1987	Z	460	--	300	--
NCW	131	425822	0714324	Friendly Beaver Campground	1987	Z	610	--	405	--
NCW	148	430055	0713836	Johnson, E.	1988	Z	340	--	175	--
NCW	149	430057	0713805	Valhanos, N.	1988	Z	320	--	225	--
NCW	152	425942	0714007	N.A. Scott & Son	1987	Z	400	--	600	--
NCW	155	430127	0714059	Sherwood, J.	1987	Z	380	--	514	--
NCW	156	430052	0713943	B.& D. Perlow	1987	Z	440	--	514	--
NCW	159	425801	0714345	BBC Devel	1988	Z	610	--	325	--
NCW	167	430117	0714111	Williams, R.	1988	Z	380	--	325	--
NCW	174	425536	0714326	Kerns, D.	1984	Z	680	--	145	--
NCW	178	425701	0714258	Mullen, K.	1985	D	540	--	10.0	--

Local site number		Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County--Continued											
Mason--Continued											
MGW	65	BEDROCK	--	--	39.0	--	15.0	01-26-88	H	8.00	413
New Boston											
NCA	1	112SRFD	--	--	--	--	--	--	U	--	USGS
NCA	8	112LCSR	--	--	--	--	10	07-29-88	--	--	USGS
NCA	10	112SRFD	--	--	--	--	--	--	U	--	USGS
NCA	99	112SRFD	--	--	--	--	--	--	U	--	USGS
NCB	1	--	--	--	--	--	--	--	--	--	--
NCB	2	--	--	--	--	--	18.3	01-24-85	--	--	--
NCB	3	--	--	--	--	--	21.2	01-24-85	U	--	--
NCB	4	--	--	--	--	--	20.8	01-24-85	U	--	--
NCB	5	--	--	--	--	--	17.6	01-24-85	U	--	--
NCW	4	111ALVM	--	--	--	--	.5	10-17-69	H	--	--
NCW	5	BEDROCK	6	S	20	--	--	--	P	--	--
NCW	8	112SRFD	2	--	48.0	48	25.2	12-06-88	U	--	USGS
NCW	40	BEDROCK	--	--	70.0	--	10.0	01-08-85	H	2.00	NHWRD 299
NCW	42	BEDROCK	--	--	104	--	40.0	08-11-88	H	2.00	NHWRD 126
NCW	55	BEDROCK	--	--	80.0	--	30.0	08-01-85	H	60.0	NHWRD 549
NCW	59	BEDROCK	--	--	64.0	--	15.0	07-22-85	H	50.0	NHWRD 549
NCW	60	BEDROCK	--	--	41.0	--	30.0	08-02-85	H	1.00	NHWRD 549
NCW	76	BEDROCK	--	--	40.0	--	--	--	H	30.0	NHWRD 315
NCW	87	BEDROCK	--	--	54.0	--	30.0	04-23-86	H	25.0	NHWRD 237
NCW	93	BEDROCK	--	--	80.0	--	10.0	10-28-86	H	100	NHWRD 315
NCW	103	112SRFD	--	--	31.0	--	10.0	09-22-86	H	40.0	NHWRD 126
NCW	104	BEDROCK	--	--	124	--	--	--	H	4.00	NHWRD 64
NCW	105	BEDROCK	--	--	22.0	--	10.0	10-21-86	H	15.0	NHWRD 549
NCW	112	BEDROCK	--	--	82.0	--	--	--	H	13.0	NHWRD 406
NCW	114	BEDROCK	--	--	59.0	--	30.0	03-09-87	H	1.50	NHWRD 413
NCW	123	BEDROCK	--	--	39.0	--	50.0	07-10-87	H	15.0	NHWRD 59
NCW	127	BEDROCK	--	--	49.0	--	15.0	07-08-87	H	80.0	NHWRD 126
NCW	129	BEDROCK	--	--	20.0	--	20.0	08-05-87	H	6.00	NHWRD 126
NCW	131	BEDROCK	--	--	40.0	--	8.0	05-18-87	P	13.0	NHWRD 104
NCW	148	BEDROCK	--	--	100	--	30.0	04-01-88	H	40.0	NHWRD 126
NCW	149	BEDROCK	--	--	94.0	--	20.0	03-17-88	C	15.0	NHWRD 126
NCW	152	BEDROCK	--	--	119	--	--	--	H	6.00	NHWRD 225
NCW	155	BEDROCK	--	--	40.0	--	--	--	H	1.50	NHWRD 225
NCW	156	BEDROCK	--	--	40.0	--	--	--	H	1.00	NHWRD 225
NCW	159	BEDROCK	--	--	39.0	--	20.0	05-18-88	H	1.00	NHWRD 208
NCW	167	BEDROCK	--	--	29.0	--	20.0	06-30-88	H	10.0	NHWRD 126
NCW	174	BEDROCK	--	--	25.0	--	30.0	11-16-84	H	25.0	NHWRD 63
NCW	178	112SRFD	--	--	2.0	--	4.0	02-20-85	H	6.00	NHWRD 421

Hillsborough County--Continued

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			New Boston--Continued						
NCW 180	425749	0713712	Smith, D.	1985	Z	500	--	330	--
NCW 182	430146	0713849	Silva, R.	1985	Z	320	--	505	--
NCW 183	425659	0714145	Cullinan, M.	1985	C	550	--	188	--
NCW 184	425657	0714143	Cullinan, M.	1985	Z	550	--	105	--
NCW 186	425650	0714304	--	--	Z	500	--	402	--
NCW 198	425742	0713950	Manter Corp	1986	Z	840	--	402	--
NCW 204	425718	0714424	St John, K.	1985	Z	570	--	345	--
NCW 210	425539	0714403	Hall Brothers Construction	1986	Z	680	--	405	--
NCW 211	425548	0714413	Hall Brothers Construction	1986	Z	650	--	405	--
NCW 216	425538	0714357	Hall Brothers	1986	Z	680	--	305	--
NCW 217	425544	0714409	Hall Brothers Construction	1986	Z	680	--	365	--
NCW 218	425542	0714406	Hall Brothers Construction	1986	Z	690	--	405	--
NCW 219	425547	0714411	Hall Brothers Construction	1986	Z	660	--	345	--
NCW 220	425538	0714353	Hall Brothers Construction	1986	Z	690	--	305	--
NCW 232	425911	0713745	Voisine, R.	1986	Z	450	--	175	--
NCW 239	425645	0714324	Elmer, S.	1986	Z	520	--	390	--
NCW 247	425715	0714150	Mach & Sons, F.	1986	Z	570	--	320	--
NCW 248	425713	0714151	Champman, O.	1987	Z	560	--	185	--
NCW 252	425903	0713742	Trade Winds Construction Inc	1987	Z	480	--	105	--
NCW 253	425719	0714151	Designs that Work	1987	Z	570	--	165	--
NCW 262	425815	0713714	O'Neil, S.	1987	Z	570	--	405	--
NCW 263	425552	0714346	Hill	1987	Z	630	--	305	--
NCW 264	425551	0714346	Schubnel	1987	Z	630	--	165	--
NCW 273	425936	0714341	Jennings, W.	1988	Z	550	--	340	--
NCW 280	430143	0713846	Lee, C.	1988	C	320	--	198	--
NCW 282	425835	0714128	Town of New Boston	1988	Z	420	--	190	--
NCW 285	425842	0714125	Diggs, K.	1989	Z	410	--	160	--
NCW 291	430038	0714324	Merrill, T.	1988	Z	590	--	278	--
			New Ipswich						
NJA 1	424522	0714947	Leger, Ernest	1988	B	850	32	0	32
NJW 1	424356	0715055	New Ipswich, Town of	1988	B	935	67	55	67
NJW 3	424612	0715216	Koivule	1988	B	1080	65	30	--
NJW 4	424402	0715250	NH Water Resources Division	1988	B	1065	68	40	68
NJW 5	424608	0715203	New Ipswich, Town of	1988	B	1080	64	35	64
NJW 6	424527	0715040	Davidson, Clayton	1955	--	990	77	22	--
NJW 7	424531	0715055	Somero, Walter	1945	--	970	140	--	--
NJW 8	424448	0715017	Belanger, Hormidas	1950	--	950	141	94	--
NJW 9	424445	0715017	Hesseltine	1950	--	940	241	154	--
NJW 10	424437	0715038	Wood, Earl	1964	--	930	295	--	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
				Hillsborough County--Continued						
				New Boston--Continued						
NCW 180	BEDROCK	--	--	29.0	--	--	--	H	2.00	NHWRD 549
NCW 182	BEDROCK	--	--	77.0	--	--	--	C	2.00	NHWRD 1
NCW 183	BEDROCK	--	--	41.0	--	5.0	05-02-85	H	12.0	NHWRD 65
NCW 184	BEDROCK	--	--	44.0	--	--	--	H	7.00	NHWRD 65
NCW 186	BEDROCK	--	--	100	--	--	--	H	--	NHWRD 315
NCW 198	BEDROCK	--	--	20.0	--	--	--	H	.25	NHWRD 406
NCW 204	BEDROCK	--	--	59.0	--	20.0	11-23-85	H	1.25	NHWRD 59
NCW 210	BEDROCK	--	--	79.0	--	80.0	05-07-86	H	20.0	NHWRD 208
NCW 211	BEDROCK	--	--	79.0	--	40.0	05-05-86	H	1.00	NHWRD 208
NCW 216	BEDROCK	--	--	114	--	40.0	06-21-86	H	5.00	NHWRD 208
NCW 217	BEDROCK	--	--	79.0	--	40.0	06-18-86	H	2.00	NHWRD 208
NCW 218	BEDROCK	--	--	64.0	--	40.0	06-19-86	H	2.00	NHWRD 208
NCW 219	BEDROCK	--	--	79.0	--	30.0	06-16-86	H	3.00	NHWRD 208
NCW 220	BEDROCK	--	--	119	--	20.0	06-13-86	H	5.00	NHWRD 208
NCW 232	BEDROCK	--	--	19.0	--	--	--	H	8.00	NHWRD 549
NCW 239	BEDROCK	--	--	29.0	--	20.0	07-09-86	H	25.0	NHWRD 104
NCW 247	BEDROCK	--	--	19.6	--	--	--	H	8.00	NHWRD 62
NCW 248	BEDROCK	--	--	19.0	--	20.0	07-11-87	H	5.00	NHWRD 59
NCW 252	BEDROCK	--	--	16.0	--	12.0	12-04-87	H	6.00	NHWRD 105
NCW 253	BEDROCK	--	--	39.0	--	25.0	11-17-87	H	50.0	NHWRD 59
NCW 262	BEDROCK	--	--	19.0	--	20.0	09-23-87	H	10.0	NHWRD 208
NCW 263	BEDROCK	--	--	19.0	--	20.0	05-15-87	H	10.0	NHWRD 208
NCW 264	BEDROCK	--	--	29.0	--	10.0	05-14-87	H	30.0	NHWRD 208
NCW 273	BEDROCK	--	--	19.0	--	--	--	H	3.00	NHWRD 1
NCW 280	BEDROCK	--	--	59.0	--	12.0	04-28-88	H	12.0	NHWRD 940
NCW 282	BEDROCK	--	--	--	--	10.0	04-12-88	--	6.00	NHWRD 940
NCW 285	BEDROCK	--	--	79.0	--	--	--	H	50.0	NHWRD 299
NCW 291	BEDROCK	--	--	19.0	--	--	--	H	6.00	NHWRD 344
				New Ipswich						
NJA 1	112SRFD	--	--	--	--	--	--	--	--	USGS
NJW 1	112SRFD	2	--	52.5	52.5	9.48	12-06-88	U	--	USGS
NJW 3	112SRFD	2	--	27.5	27.5	12.1	12-06-88	U	--	USGS
NJW 4	112SRFD	2	--	37.5	37.5	11.5	12-06-88	U	--	USGS
NJW 5	112SRFD	2	--	32.5	32.5	16.8	12-06-88	U	--	USGS
NJW 6	--	--	--	--	--	--	--	H	--	--
NJW 7	--	--	--	--	--	--	--	H	--	--
NJW 8	--	--	--	--	--	70	-- -50	H	--	--
NJW 9	--	--	--	--	--	9	-- -50	H	--	Chapman
NJW 10	--	--	--	--	--	2	-- -64	H	--	McKenna

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Hillsborough County--Continued						
			New Ipswich--Continued						
NJW 11	424331	0715113	Nelson, Esther	1957	--	1000	190	45	--
NJW 12	424319	0715113	Walker, Robert	1964	--	960	350	25	--
NJW 14	424415	0715216	Jenny, John	1960	--	1060	148	39	--
NJW 20	424438	0715009	Chapman, Earl	1964	--	980	100	--	--
NJW 23	424607	0715019	Witty, Everett	1950	--	940	298	14	--
NJW 24	424611	0715041	Thompson, Gilbert	1945	--	990	330	72	--
NJW 26	424506	0715019	--	--	--	950	128	--	--
NJW 28	424501	0714938	--	--	--	950	227	227	--
NJW 29	424520	0714939	--	--	--	850	120	120	--
NJW 33	424316	0715125	--	--	--	1050	150	150	--
NJW 48	424501	0714949	Rodenhiser, A.	1985	Z	960	--	365	--
NJW 59	424355	0715157	Freed, A.	1985	Z	1010	--	405	--
NJW 61	424711	0715109	Timberland Design Inc	1986	Z	1020	--	900	--
NJW 62	424709	0715107	Timberland Design	1986	Z	1020	--	400	--
NJW 68	424551	0715042	Kangas, R.	1985	Z	1000	--	205	--
NJW 73	424625	0715122	Muhonen, T.	1986	Z	1060	--	340	--
NJW 81	424509	0715000	Ober, N.	1986	Z	940	--	400	--
NJW 88	424555	0715101	Langell, C.	1986	Z	1000	--	155	--
NJW 96	424354	0715123	Milbert, J.	1986	Z	950	--	400	--
NJW 97	424339	0715059	Saari, W.	1987	C	950	--	194	--
NJW 103	424357	0715248	Thomforde, D.	1987	Z	1090	--	140	--
NJW 111	424338	0715101	B & D Homes	1987	Z	950	--	260	--
NJW 114	424357	0715242	Grade A Devel	1987	Z	1080	--	240	--
NJW 115	424402	0715219	Aho, R.	1987	Z	1100	--	300	--
NJW 119	424640	0715442	--	1987	Z	1280	--	440	--
NJW 124	424402	0715126	McGinty, J.	1987	Z	960	--	360	--
NJW 126	424336	0715102	Hakala Construction	1987	Z	960	--	260	--
NJW 139	424653	0715041	Dominican Sisters Bethany	1988	Z	1020	--	445	--
NJW 141	424705	0715123	Timberland Design Inc	1988	Z	1060	--	400	--
NJW 149	424445	0715038	--		--	935	170	170	--
			Temple						
TMA 1	424856	0715013	Temple, Town of	1988	B	870	42	--	--
TMW 2	424841	0715137	Harland	1960	--	1050	295	95	--
TMW 4	424851	0715015	Connell, William	1962	--	860	230	--	--
TMW 5	424850	0715017	Hamlin	1946	--	860	152	74	--
TMW 9	424757	0715044	Torrey, Herbert	1958	--	960	330	85	--
TMW 10	424719	0714957	--	--	--	970	--	--	--
TMW 16	424857	0715111	--	--	--	1020	100	100	--
TMW 18	424852	0715108	--	--	--	1000	195	195	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County--Continued										
New Ipswich--Continued										
NJW 11	--	--	--	--	--	6	-- -57	H	--	Chapman
NJW 12	--	--	--	--	--	25	-- -64	H	--	Chapman
NJW 14	--	--	--	--	--	27	-- -62	H	--	Chapman
NJW 20	--	--	--	--	--	6	-- -64	H	--	McKenna
NJW 23	--	--	--	--	--	--	--	H	--	Wheeler
NJW 24	--	--	--	--	--	--	--	H	--	--
NJW 26	--	--	--	--	--	--	--	--	--	--
NJW 28	--	--	--	--	--	12	07-21-58	--	--	--
NJW 29	--	--	--	--	--	30	08-01-63	--	--	--
NJW 33	--	--	--	--	--	22	01-01-57	--	--	--
NJW 48	BEDROCK	--	--	94.0	--	--	--	H	4.00	325
NJW 59	BEDROCK	--	--	39.0	--	20.0	09-28-85	H	2.50	237
NJW 61	BEDROCK	--	--	59.0	--	--	--	H	3.50	177
NJW 62	BEDROCK	--	--	29.0	--	--	--	H	15.0	177
NJW 68	BEDROCK	--	--	59.0	--	20.0	08-13-85	H	45.0	237
NJW 73	BEDROCK	--	--	31.0	--	25.0	11-22-86	H	3.00	63
NJW 81	BEDROCK	--	--	190	--	--	--	H	9.00	249
NJW 88	BEDROCK	--	--	79.0	--	--	--	H	1.50	343
NJW 96	BEDROCK	--	--	99.0	--	--	--	H	2.00	343
NJW 97	BEDROCK	--	--	20.0	--	15.0	02-25-87	H	15.0	128
NJW 103	BEDROCK	--	--	62.0	--	--	--	H	6.00	249
NJW 111	BEDROCK	--	--	39.0	--	--	--	H	3.00	63
NJW 114	BEDROCK	--	--	59.0	--	16.0	07-31-87	H	4.50	63
NJW 115	BEDROCK	--	--	17.0	--	--	--	H	3.00	63
NJW 119	BEDROCK	--	--	19.0	--	--	--	H	20.0	343
NJW 124	BEDROCK	--	--	19.0	--	20.0	10-07-87	H	7.00	413
NJW 126	BEDROCK	--	--	39.0	--	40.0	10-09-87	H	7.00	343
NJW 139	BEDROCK	--	--	63.0	--	--	--	H	7.00	177
NJW 141	BEDROCK	--	--	41.0	--	--	--	H	8.00	177
NJW 149	--	--	--	--	--	8	01-01-57	--	--	--
Temple										
TMA 1	112SRFD	--	--	--	--	--	--	U	--	USGS
TMW 2	--	--	--	--	--	44	-- -60	H	--	McKenna
TMW 4	--	--	--	--	--	30	-- -62	H	--	McKenna
TMW 5	--	--	--	--	--	33	-- -46	H	--	Chapman
TMW 9	--	--	--	--	--	10	-- -58	H	--	Chapman
TMW 10	--	--	--	--	--	--	--	H	--	--
TMW 16	--	--	--	--	--	--	--	--	--	--
TMW 18	--	--	--	--	--	3	07-01-61	--	--	--

Local site number		Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
				Hillsborough County--Continued						
				Temple--Continued						
TMW	20	424902	0715232	Rousseau	1984	D	1180	--	11.0	--
TMW	21	424723	0715125	Bond, D.	1985	Z	980	--	305	--
TMW	26	424743	0715029	Pouliout, R.	1985	Z	900	--	625	--
TMW	27	424724	0714956	Salera, A.	1985	Z	1080	--	305	--
TMW	29	424729	0714958	Crooker, R.	1985	Z	680	--	705	--
TMW	30	424853	0715133	Webster, L.	1985	Z	1020	--	145	--
TMW	33	424757	0715212	O'Malley, J.	1986	Z	1260	--	385	--
TMW	34	424718	0715130	Dugas, W.	1986	Z	960	--	305	--
TMW	35	424801	0715229	Crowther, J.	1987	Z	1200	--	405	--
TMW	38	424723	0715024	Crowe, R.	1987	C	700	--	173	--
TMW	39	424745	0715204	Oxman A.	1987	D	1120	--	17.0	--
TMW	40	424905	0715012	Mazza W.	1987	Z	880	--	160	--
TMW	42	424741	0715028	Pouliout, R.	1988	Z	--	--	780	--
				Weare						
WGA	1	430626	0713933	U.S. Corps of Engineers	1988	B	350	12.5	--	13
WGW	1	430645	0714427	Russell, G.A.	1900	D	510	25	25	--
WGW	11	430235	0714058	Lanctot, Joe	1961	D	430	21	21	--
WGW	13	430601	0714546	Peterson, Carl	--	D	740	25	25	--
WGW	14	430628	0714615	Denoncourt, Steve	1983	D	630	--	--	--
WGW	15	430635	0714543	Ludders, Let	--	D	600	--	--	--
WGW	16	430633	0714458	Morris, Jean	--	D	560	11.8	11.8	--
WGW	17	430634	0714005	U.S. Corps of Engineers	1988	B	370	35	30	35
WGW	18	430633	0714350	Sawyer	1988	B	650	91	72.5	91
WGW	19	430518	0714345	State of New Hampshire	1988	B	630	61	30	61
WGW	20	430141	0714041	Weare, Town of	1988	B	390	35	15	35
WGW	21	430356	0713907	Boisvert	1988	B	310	99	65	99
WGW	25	430635	0714320	Duncan, S.	1962	--	500	--	106	--
WGW	26	430636	0714447	French, C.	1960	--	560	--	175	--
WGW	28	430637	0714324	Keddy, W.	1962	--	490	--	100	--
WGW	30	430700	0714359	Sudler, L.	1961	--	490	--	215	--
WGW	35	430630	0714632	Maribito	1984	Z	680	--	460	--
WGW	69	430627	0714436	McDonald, D.	1985	Z	540	--	295	--
WGW	74	430543	0714326	Bolton, F.	1985	Z	580	--	275	--
WGW	83	430627	0714558	Heino, W.	1985	Z	600	--	220	--
WGW	93	430703	0714353	Bayer, C.	1985	Z	520	--	315	--
WGW	98	430233	0714053	Carson, J.	1985	Z	--	--	180	--
WGW	101	430645	0714411	Coulombe, B.	1985	Z	540	--	275	--
WGW	114	430642	0714402	Greenough, C.	1985	Z	520	--	520	--
WGW	138	430309	0714620	Soucy, L.	1985	Z	810	--	200	--
WGW	141	430640	0714512	Setterlund, W.	1985	Z	580	--	265	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County--Continued										
Temple--Continued										
TMW 20	112SRFD	--	--	11.0	--	3.0	10-04-84	H	50.0	811
TMW 21	BEDROCK	--	--	39.0	--	34.0	03-28-85	H	5.00	237
TMW 26	BEDROCK	--	--	20.0	--	20.0	08-16-85	H	1.00	63
TMW 27	BEDROCK	--	--	83.0	--	--	--	H	3.00	63
TMW 29	BEDROCK	--	--	99.0	--	--	--	H	1.50	237
TMW 30	BEDROCK	--	--	19.0	--	13.0	06-17-85	H	6.00	237
TMW 33	BEDROCK	--	--	139	--	20.0	01-10-86	H	1.25	237
TMW 34	BEDROCK	--	--	19.0	--	20.0	09-11-86	H	9.00	173
TMW 35	BEDROCK	--	--	19.0	--	20.0	02-18-87	H	2.00	172
TMW 38	BEDROCK	--	--	114	--	8.0	08-21-87	H	25.0	128
TMW 39	112SRFD	--	--	18.0	--	4.0	--	H	50.0	390
TMW 40	BEDROCK	--	--	19.0	--	--	--	H	8.50	63
TMW 42	BEDROCK	--	--	40.0	--	--	--	H	.25	327
Weare										
WGA 1	112SRFD	--	--	--	--	--	--	T	--	USGS
WGW 1	112TILL	--	--	--	--	--	--	H	--	--
WGW 11	112TILL	--	--	--	--	20	-- -69	H	--	King
WGW 13	110SDMN	--	--	--	--	6.2	05-23-88	H	--	--
WGW 14	110SDMN	--	--	--	--	2.2	05-23-88	H	--	--
WGW 15	110SDMN	--	--	--	--	4.1	05-23-88	--	--	--
WGW 16	110SDMN	--	--	--	--	2.68	05-23-88	U	--	--
WGW 17	112SRFD	2	--	27.5	27.5	3.63	12-06-88	U	--	USGS
WGW 18	112SRFD	2	--	70.0	70	30.6	12-06-88	U	--	USGS
WGW 19	112SRFD	2	--	27.5	27.5	6.41	12-06-88	U	--	USGS
WGW 20	112SRFD	2	--	12.9	12.9	--	--	U	--	USGS
WGW 21	112SRFD	2	--	62.5	62.5	--	--	U	--	USGS
WGW 25	BEDROCK	--	--	72	--	27	06-13-62	H	--	A and B
WGW 26	BEDROCK	--	--	--	--	--	--	H	--	Patenaude
WGW 28	BEDROCK	--	--	--	--	8	-- -62	H	--	Chandler
WGW 30	BEDROCK	--	--	50	--	12	04-28-61	H	--	A and B
WGW 35	BEDROCK	--	--	47.0	--	30.0	02-20-84	H	2.00	NHWRD 1
WGW 69	BEDROCK	--	--	53.0	--	--	--	H	3.00	NHWRD 1
WGW 74	BEDROCK	--	--	59.0	--	--	--	H	4.00	NHWRD 315
WGW 83	BEDROCK	--	--	60.0	--	10.0	04-27-85	H	2.00	NHWRD 1
WGW 93	BEDROCK	--	--	29.0	--	--	--	H	4.00	NHWRD 59
WGW 98	BEDROCK	--	--	--	--	20.0	07-29-85	H	20.0	NHWRD 327
WGW 101	BEDROCK	--	--	17.0	--	--	--	H	3.00	NHWRD 641
WGW 114	BEDROCK	--	--	20.0	--	--	--	H	4.00	NHWRD 1
WGW 138	BEDROCK	--	--	19.0	--	--	--	H	100	NHWRD 1
WGW 141	BEDROCK	--	--	77.0	--	--	--	C	5.00	NHWRD 1

Hillsborough County--Continued

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Weare--Continued						
WGW 144	430557	0714248	Luksza, M.	1985	Z	600	--	190	--
WGW 149	430642	0714413	Andrews, D.	1985	Z	520	--	420	--
WGW 151	430547	0714332	AM Construction Company	1985	Z	600	--	220	--
WGW 156	430306	0713919	Chase, N.	1986	C	340	--	312	--
WGW 163	430337	0713857	Nallin, K.	1986	Z	400	--	300	--
WGW 164	430459	0714728	Trout, C.	1986	Z	680	--	303	--
WGW 189	430511	0714741	Ferri, R.	1984	Z	710	--	365	--
WGW 203	430200	0714020	Staples, D.	1986	Z	380	--	300	--
WGW 209	430346	0713919	Reynolds, J.	1987	Z	360	--	80.0	--
WGW 215	430510	0714404	Todd, C.	1986	Z	700	--	281	--
WGW 216	430554	0714247	Lessard, D.	1986	Z	590	--	325	--
WGW 219	430152	0713906	Vaugham, M.	1986	Z	320	--	325	--
WGW 226	430648	0714350	Murphy, F.	1987	Z	500	--	340	--
WGW 228	430221	0713846	Roy, R.	1987	Z	320	--	310	--
WGW 241	430154	0714022	Therrien, L.	1987	Z	370	--	305	--
WGW 264	430505	0714420	Mason, D.	1987	Z	740	--	405	--
WGW 275	430255	0714136	Renshaw, R.	1987	Z	440	--	220	--
WGW 278	430607	0714502	Rose, W.	1987	Z	670	--	400	--
WGW 283	430648	0714425	Martin, L.	1987	Z	520	--	420	--
WGW 284	430720	0714430	Schaller, R.	1987	Z	560	--	420	--
WGW 285	430722	0714429	Allied Homes	1987	Z	560	--	310	--
WGW 296	430504	0714731	Hartford	1987	Z	700	--	380	--
WGW 301	430333	0713859	P & G Construction Co	1987	Z	400	--	150	--
WGW 302	430629	0714456	Roy, G.	1987	Z	590	--	273	--
WGW 318	430730	0714430	Chicoine, M.	1987	Z	580	--	202	--
WGW 322	430507	0714733	Arseneau & Sons	1987	Z	720	--	360	--
WGW 329	430213	0714027	Dupuis, W.	1988	Z	400	--	175	--
WGW 332	430344	0713921	Fisher, T.	1988	Z	360	--	420	--
WGW 334	430724	0714425	Sullivan	1988	Z	520	--	185	--
WGW 335	430340	0713903	Boisvert & Sons W.Inc	1988	D	320	--	22.0	--
WGW 336	430523	0714348	Brown, G.	1988	Z	610	--	423	--
WGW 342	430727	0714426	Dickstein	1988	Z	530	--	222	--
WGW 349	430241	0714101	Lanctot, J.	1988	D	400	--	23.0	--
WGW 357	430510	0714427	Cushing, L.	1988	Z	790	--	420	--
WGW 359	430250	0714130	Renshaw, R.	1988	Z	460	--	420	--
WGW 360	430247	0714132	Renshaw, R.	1988	Z	460	--	280	--
WGW 361	430424	0713923	Corriveau Construction	1988	Z	340	--	500	--
WGW 362	430426	0713923	Fireside Builders	1988	Z	340	--	400	--
WGW 363	430428	0713924	Fireside Builders	1988	Z	340	--	220	--
WGW 364	430550	0714332	Hemlock Builders	1988	Z	600	--	300	--
WGW 369	430612	0714214	RV Homes	1988	Z	420	--	260	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
				Hillsborough County--Continued						
				Weare--Continued						
WGW 144	BEDROCK	--	--	40.0	--	--	--	H	12.0	NHWRD 1
WGW 149	BEDROCK	--	--	20.0	--	20.0	12-10-85	H	60.0	NHWRD 1
WGW 151	BEDROCK	--	--	59.0	--	--	--	H	10.0	NHWRD 1
WGW 156	BEDROCK	--	--	37.0	--	--	--	H	2.00	NHWRD 113
WGW 163	BEDROCK	--	--	30.0	--	--	--	H	4.50	NHWRD 315
WGW 164	BEDROCK	--	--	90.0	--	--	--	H	10.0	NHWRD 315
WGW 189	BEDROCK	--	--	161	--	--	--	H	5.00	NHWRD 522
WGW 203	BEDROCK	--	--	34.0	--	50.0	10-04-86	H	2.00	NHWRD 549
WGW 209	112SRFD	--	--	39.0	--	--	--	H	15.0	NHWRD 549
WGW 215	BEDROCK	--	--	90.0	--	--	--	H	75.0	NHWRD 3
WGW 216	BEDROCK	--	--	19.0	--	--	--	H	20.0	NHWRD 522
WGW 219	BEDROCK	--	--	59.0	--	--	--	H	30.0	NHWRD 522
WGW 226	BEDROCK	--	--	42.0	--	--	--	H	.75	NHWRD 1
WGW 228	BEDROCK	--	--	20.0	--	--	--	H	10.0	NHWRD 1
WGW 241	BEDROCK	--	--	20.0	--	--	--	H	5.00	NHWRD 549
WGW 264	BEDROCK	--	--	34.0	--	6.0	05-09-87	H	4.00	NHWRD 104
WGW 275	BEDROCK	--	--	33.0	--	8.0	09-17-87	H	25.0	NHWRD 1
WGW 278	BEDROCK	--	--	17.0	--	10.0	09-30-87	H	4.00	NHWRD 1
WGW 283	BEDROCK	--	--	35.0	--	20.0	10-20-87	H	5.00	NHWRD 1
WGW 284	BEDROCK	--	--	23.0	--	20.0	11-16-87	H	2.00	NHWRD 1
WGW 285	BEDROCK	--	--	17.0	--	20.0	11-16-87	H	1.50	NHWRD 1
WGW 296	BEDROCK	--	--	179	--	50.0	10-30-87	H	30.0	NHWRD 413
WGW 301	BEDROCK	--	--	19.0	--	--	--	H	7.00	NHWRD 225
WGW 302	BEDROCK	--	--	120	--	--	--	H	25.0	NHWRD 225
WGW 318	BEDROCK	--	--	30.0	--	--	--	H	30.0	NHWRD 225
WGW 322	BEDROCK	--	--	159	--	60.0	11-06-87	H	10.0	NHWRD 413
WGW 329	BEDROCK	--	--	20.0	--	15.0	04-20-88	H	12.0	NHWRD 126
WGW 332	BEDROCK	--	--	19.0	--	30.0	06-07-88	H	20.0	NHWRD 413
WGW 334	BEDROCK	--	--	92.0	--	6.0	06-19-88	H	5.00	NHWRD 105
WGW 335	112SRFD	--	--	21.0	--	9.0	08-01-88	H	15.0	NHWRD 279
WGW 336	BEDROCK	--	--	60.0	--	16.0	06-07-88	H	4.00	NHWRD 3
WGW 342	BEDROCK	--	--	20.0	--	--	--	H	7.00	NHWRD 406
WGW 349	112SRFD	--	--	17.0	--	10.0	08-11-88	H	--	NHWRD 279
WGW 357	BEDROCK	--	--	19.0	--	12.0	07-06-88	H	2.50	NHWRD 1
WGW 359	BEDROCK	--	--	30.0	--	--	--	H	1.00	NHWRD 1
WGW 360	BEDROCK	--	--	14.0	--	20.0	07-06-88	H	5.00	NHWRD 1
WGW 361	BEDROCK	--	--	31.0	--	--	--	H	2.50	NHWRD 1
WGW 362	BEDROCK	--	--	20.0	--	10.0	06-14-88	H	6.00	NHWRD 1
WGW 363	BEDROCK	--	--	22.0	--	--	--	H	30.0	NHWRD 1
WGW 364	BEDROCK	--	--	56.0	--	--	--	H	20.0	NHWRD 1
WGW 369	BEDROCK	--	--	33.0	--	15.0	04-21-88	P	30.0	NHWRD 1

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Hillsborough County--Continued						
			Weare--Continued						
WGW 373	430627	0714553	Heino, W.	1988	Z	600	--	420	--
WGW 381	430340	0713918	Spellman, S.	1988	Z	360	--	525	--
WGW 413	430636	0714404	Martin, R.	1988	Z	520	--	600	--
WGW 414	430724	0714418	Carrigan, P.	1988	Z	500	--	300	--
WGW 416	430734	0714428	Rice, D.	1988	Z	550	--	200	--
WGW 418	430602	0714253	Macauley, B.	1988	Z	600	--	600	--
WGW 419	430546	0714329	Simoneau, P.	1988	Z	600	--	240	--
WGW 428	430159	0713902	Colburn & Farmer	1988	Z	320	--	205	--
WGW 430	430239	0713850	Laporte, R.	1988	Z	360	--	230	--
WGW 445	430720	0714425	Massaro, P.	1988	Z	520	--	300	--
WGW 454	430645	0714417	Morrill, B.	1988	Z	520	--	400	--
WGW 455	430547	0714324	Martin, R.	1988	Z	560	--	560	--
WGW 475	430454	0714324	Hamel, M.	1989	Z	780	--	260	--
WGW 484	430552	0714333	Church, S.	1988	Z	590	--	200	--
WGW 485	430250	0714136	Renshaw, R.	1988	Z	460	--	300	--
WGW 492	430522	0714419	Laprote, R.	1989	Z	710	--	265	--
WGW 506	430242	0713855	Laporte, R.	1989	Z	340	--	325	--
			Merrimack County						
			Allenstown						
ATA 1	430715	0712737	McNamara, J.	1989	B	220	27	--	--
ATA 2	430715	0712730	McNamara, J.	1989	B	300	24	--	--
			Bow						
BUW 8	430728	0712819	Bow, Town of	1989	B	210	68	60	68
BUW 9	430724	0712807	Bow, Town of	1989	B	200	83	70	83
			Dunbarton						
DNW 4	430415	0713752	Holliday Acres	1956	--	440	--	112	--
DNW 68	430751	0713911	Lamphere, R.	1986	Z	440	--	313	--
DNW 135	430431	0713754	Poirier, M.	1989	Z	450	--	460	--
			Hooksett						
HTA 1	430649	0712802	Hooksett, Town of	1989	B	200	23	--	23
HTA 2	430621	0712751	Hooksett, Town of	1989	B	--	10	--	--
HTA 3	430322	0712714	Manchester Sand and Gravel	1989	B	250	114	--	114
HTA 4	430252	0712646	Hooksett, Town of	1989	B	290	75	--	75
HTB 1	430408	0712819	NH Department of Transportation	1954	--	230	40	--	--

Local site number	Primary aquifer code	Diameter of well (inches)	Casing material code	Depth to bottom of casing (feet)	Depth to top of opening (feet)	Water level Depth (feet)	Water level Date (mm-dd-yy)	Use	Maximum well yield (gallons per minute)	Name of driller or NHWRD driller number
Hillsborough County--Continued										
Weare--Continued										
WGW 373	BEDROCK	--	--	57.0	--	--	--	H	12.0	NHWRD 1
WGW 381	BEDROCK	--	--	21.0	--	20.0	08-11-88	H	1.50	NHWRD 126
WGW 413	BEDROCK	--	--	50.0	--	--	--	H	2.50	NHWRD 225
WGW 414	BEDROCK	--	--	89.0	--	--	--	H	8.00	NHWRD 225
WGW 416	BEDROCK	--	--	55.0	--	--	--	H	50.0	NHWRD 225
WGW 418	BEDROCK	--	--	20.0	--	--	--	H	1.00	NHWRD 225
WGW 419	BEDROCK	--	--	62.0	--	--	--	H	20.0	NHWRD 225
WGW 428	BEDROCK	--	--	46.0	--	6.0	12-06-88	H	40.0	NHWRD 126
WGW 430	BEDROCK	--	--	41.0	--	12.0	12-06-88	H	20.0	NHWRD 126
WGW 445	BEDROCK	--	--	52.0	--	--	--	H	3.00	NHWRD 225
WGW 454	BEDROCK	--	--	29.0	--	--	--	H	1.75	NHWRD 225
WGW 455	BEDROCK	--	--	129	--	40.0	12-29-88	H	10.0	NHWRD 413
WGW 475	BEDROCK	--	--	60.0	--	--	--	H	15.0	NHWRD 225
WGW 484	BEDROCK	--	--	65.0	--	30.0	08-16-88	H	15.0	NHWRD 1
WGW 485	BEDROCK	--	--	31.0	--	30.0	09-08-88	H	25.0	NHWRD 1
WGW 492	BEDROCK	--	--	20.0	--	40.0	04-20-89	H	100	NHWRD 126
WGW 506	BEDROCK	--	--	37.0	--	20.0	10-12-89	H	6.00	NHWRD 126
Merrimack County										
Allenstown										
ATA 1	112SRFD	--	--	--	--	--	--	--	--	USGS
ATA 2	112SRFD	--	--	--	--	--	--	--	--	USGS
Bow										
BUW 8	112SRFD	2	P	57.5	57.5	27.5	08-31-89	U	--	USGS
BUW 9	112SRFD	2	P	67.5	67.5	--	--	U	--	USGS
Dunbarton										
DNW 4	BEDROCK	--	--	--	--	--	--	--	--	Daniels
DNW 68	BEDROCK	--	--	40.0	--	--	--	H	4.00	NHWRD 315
DNW 135	BEDROCK	--	--	69.0	--	--	--	H	1.50	NHWRD 225
Hooksett										
HTA 1	112SRFD	--	--	--	--	--	--	--	--	USGS
HTA 2	112SRFD	--	--	--	--	--	--	--	--	USGS
HTA 3	112SRFD	--	--	--	--	--	--	U	--	USGS
HTA 4	112SRFD	--	--	--	--	--	--	U	--	USGS
HTB 1	--	--	--	--	--	--	--	--	--	--

Local site number		Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
				Merrimack County--Continued						
				Hooksett--Continued						
HTB	3	430609	0712832	NH Department of Transportation	1955	--	300	33	--	--
HTB	4	430510	0712828	NH Department of Transportation	1955	--	310	62	--	--
HTB	5	430509	0712826	NH Department of Transportation	1955	--	310	60	--	--
HTB	8	430229	0712838	NH Department of Transportation	1972	--	190	45	--	--
HTB	9	430228	0712844	NH Department of Transportation	1972	--	190	62	--	62
HTB	10	430237	0712753	NH Department of Transportation	1972	--	250	23	--	23
HTB	11	430238	0712754	NH Department of Transportation	1972	--	260	6	--	--
HTB	14	430627	0712655	NH Department of Transportation	1981	--	307	35	--	--
HTB	15	430541	0712751	NH Department of Transportation	1976	--	187	60	--	60
HTB	16	430544	0712754	NH Department of Transportation	1976	--	176	33	--	33
HTB	17	430547	0712755	NH Department of Transportation	1976	--	195	29	--	29
HTW	1	430340	0712635	Central Hooksett Water Precinct	1956	C	290	40	40	--
HTW	2	430358	0712638	Central Hooksett Water Precinct	1965	C	300	44	44.0	--
HTW	3	430350	0712630	Manchester Sand and Gravel	1938	C	290	48	48.0	--
HTW	4	430633	0712820	Plourde Sand and Gravel	1900	C	260	90	90	--
HTW	6	430457	0712835	Hooksett Village Water Precint	1979	--	380	13	13	13
HTW	7	430454	0712833	Hooksett Village Water Precint	1979	--	310	25	25	25
HTW	8	430414	0712828	Hooksett Village Water Precint	1979	--	290	68	68	68
HTW	9	430404	0712823	Hooksett Village Water Precint	1979	--	230	63	63	63
HTW	10	430539	0712826	Hooksett Village Water Precint	1979	--	200	56	56	--
HTW	11	430538	0712825	Hooksett Village Water Precint	1979	--	270	56	56	56
HTW	12	430540	0712823	Hooksett Village Water Precint	1979	--	250	28	28	28
HTW	13	430539	0712828	Hooksett Village Water Precint	1980	--	260	28	28	--
HTW	14	430542	0712829	Hooksett Village Water Precint	1980	--	250	35	35	--
HTW	15	430512	0712814	State of New Hampshire	1989	B	280	143	100	--
HTW	16	430422	0712746	Hooksett Village Water Precint	1989	B	200	140	90	--
HTW	17	430520	0712809	State of New Hampshire	1989	B	200	77	60	--
HTW	18	430408	0712634	Manchester Sand and Gravel	1989	B	310	46	40	46
HTW	19	430321	0712705	Manchester Sand and Gravel	1989	B	260	47	40	47
HTW	20	430314	0712701	Manchester Sand and Gravel	1989	B	250	46	40	46
HTW	23	430409	0712727	--	--	--	300	52	52	--
HTW	24	430504	0712741	--	--	--	295	--	153	--
HTW	25	430303	0712735	--	--	--	250	--	110	--
HTW	27	430044	0712353	Q	--	--	295	--	348	--
HTW	28	430301	0712614	Alexander	1962	--	295	--	124	--
HTW	29	430303	0712608	Burbank	1953	--	315	--	125	--
HTW	33	430427	0712719	--	1955	--	--	--	105	--
HTW	42	430234	0712756	--	--	--	230	--	150	--
HTW	43	430244	0712747	--	1963	--	275	--	158	--
HTW	55	430220	0712604	--	1956	--	280	--	103	--
HTW	75	430418	0712846	Sorel	1984	C	310	--	150	--

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)

Merrimack County--Continued

Hooksett--Continued

HTB 3	--	--	--	--	--	--	--	--	--	--
HTB 4	--	--	--	--	--	--	--	--	--	--
HTB 5	--	--	--	--	--	--	--	--	--	--
HTB 8	--	--	--	--	--	--	--	--	--	--
HTB 9	--	--	--	--	--	--	--	--	--	--
HTB 10	--	--	--	--	--	--	--	--	--	--
HTB 11	--	--	--	--	--	--	--	--	--	--
HTB 14	--	--	--	--	--	--	--	--	--	--
HTB 15	--	--	--	--	--	--	--	--	--	--
HTB 16	--	--	--	--	--	--	--	--	--	--
HTB 17	--	--	--	--	--	--	--	--	--	--
HTW 1	112OTSH	12	S	30	--	14	-- -70	P	135	Chapman Co.
HTW 2	112OTSH	12.0	S	34	10.0	10.0	06-01-69	P	235	Chapman Co.
HTW 3	112OTSH	10.0	S	28	28.0	--	--	N	400	Bay State
HTW 4	112OTSH	2	S	87	--	71.4	09-11-69	U	7	Gallagher
HTW 6	--	--	--	--	--	--	--	U	--	--
HTW 7	--	--	--	--	--	3	06-20-79	U	--	--
HTW 8	--	--	--	--	--	39	06-21-79	U	--	--
HTW 9	--	--	--	--	--	24.5	06-26-79	U	--	--
HTW 10	112SRFD	--	--	--	--	6.4	07-30-79	P	--	--
HTW 11	--	--	--	--	--	11	08-01-79	U	--	--
HTW 12	--	--	--	--	--	--	--	U	--	--
HTW 13	--	--	--	--	--	--	--	U	--	--
HTW 14	--	--	--	--	--	8.5	06- -80	U	--	--
HTW 15	112SRFD	2	P	97.5	97.5	81.5	08-31-89	U	--	USGS
HTW 16	112SRFD	2	P	87.5	87.5	17.7	08-31-89	U	--	USGS
HTW 17	--	2	P	60	57.5	--	--	U	--	--
HTW 18	112SRFD	2	P	37.5	37.5	--	--	U	--	USGS
HTW 19	112SRFD	2	P	37.5	37.5	16.3	03-28-90	U	--	USGS
HTW 20	112SRFD	2	P	37.5	37.5	29.6	03-28-90	U	--	USGS
HTW 23	--	--	--	--	--	48.2	06-25-79	--	--	--
HTW 24	--	--	--	--	--	--	--	--	--	--
HTW 25	--	--	--	--	--	--	--	--	--	--
HTW 27	--	--	--	--	--	--	--	--	--	Fischer
HTW 28	--	--	--	--	--	--	--	--	--	Dube
HTW 29	--	--	--	--	--	--	--	--	--	Dube
HTW 33	--	--	--	--	--	--	--	--	--	A and B
HTW 42	--	--	--	--	--	--	--	--	--	Tasker
HTW 43	--	--	--	--	--	--	--	--	--	Tasker
HTW 55	--	--	--	--	--	--	--	--	--	Dube
HTW 75	BEDROCK	--	--	19.0	--	--	--	H	20.0	NHWRD 239

Local site number	Latitude	Longitude	Owner or user	Year completed	Method of construction	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
Merrimack County--Continued									
Hooksett									
HTW 79	430431	0712236	Grady	1984	Z	490	--	250	--
HTW 106	430416	0712844	Sorel, M.	1984	C	300	--	150	--
HTW 107	430431	0712848	Erskin, D.	1984	C	320	--	173	--
HTW 124	430321	0712727	Jacobs, B.	1985	Z	190	--	500	--
HTW 158	430424	0712310	Durant, H.	1986	Z	440	--	125	--
HTW 182	430639	0712718	Phaneuf, B.	1986	Z	270	--	405	--
HTW 204	430411	0712803	CB Sullivan	1987	Z	190	--	565	--
HTW 208	430216	0712824	Houle, R.	1987	Z	190	--	380	--
HTW 217	430433	0712331	Stevens, B.	1987	Z	440	--	400	--
HTW 223	430340	0712754	Duford, D.	1987	Z	230	--	505	--
HTW 230	430616	0712755	Town of Hooksett	1988	Z	190	--	280	--
HTW 244	430404	0712321	Fedderson, D.	1988	Z	430	--	600	--
HTW 245	430229	0712858	Norman, A.	1988	Z	280	--	180	--
HTW 248	430343	0712724	--	--	--	246.	123	--	--
HTW 249	430332	0712714	--	--	--	278.0	--	--	--
HTW 250	430331	0712702	--	--	--	290.1	--	--	--
HTW 251	430320	0712649	--	--	--	287.1	--	--	--
HTW 252	430319	0712708	--	--	--	261.0	--	--	--
HTW 253	430322	0712709	--	--	--	259.8	--	--	--
HTW 254	430333	0712724	--	--	--	272.7	--	--	--
HTW 255	430322	0712719	--	--	--	192.7	64.0	--	--
HTW 258	430319	0712658	--	--	--	260.3	--	--	--
HTW 259	430311	0712647	--	--	--	266.0	--	--	--
HTW 260	430302	0712646	--	--	--	261.8	26.0	--	--
HTW 262	430329	0712652	--	--	--	281.5	--	--	--
HTW 263	430340	0712701	--	--	--	292.1	--	--	--
HTW 264	430339	0712709	--	--	--	284.2	--	--	--
HTW 265	430559	0712820	Hooksett Village Water Precinct	1986	--	265	47	42	--
HTW 268	430352	0712653	Central Hooksett Water Precinct	--	--	290	--	--	--
HTW 269	430416	0712636	--		--	315	--	--	--
Rockingham County									
Auburn									
AUA 1	425959	0712044	Manchester Water Works	1989	B	260	17	--	--
AUA 2	430036	0712018	Manchester Water Works	1989	B	260	47	--	--
AUA 3	430046	0712046	Manchester Water Works	1989	B	270	42	--	42
AUA 4	425948	0711806	Manchester Water Works	1989	B	330	17	--	17
AUB 1	430123	0712158	NH Department of Transportation	1972	--	294	19	--	--

wells and borings--Continued

Local site number		Lat-itude	Long-itude	Owner or user		Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
						Merrimack County--Continued					
						Hooksett					
HTW 79	BEDROCK	--	--	18.0	--	20.0	07-23-84	H	10.0		NHWRD 1
HTW 106	BEDROCK	--	--	19.0	--	5.0	11-14-84	H	5.00		NHWRD 239
HTW 107	BEDROCK	--	--	29.0	--	15.0	12-13-84	H	9.00		NHWRD 239
HTW 124	BEDROCK	--	--	69.0	--	--	--	H	2.50		NHWRD 143
HTW 158	BEDROCK	--	--	19.0	--	15.0	09-08-86	H	12.0		NHWRD 59
HTW 182	BEDROCK	--	--	114	--	50.0	10-04-86	H	4.00		NHWRD 126
HTW 204	BEDROCK	--	--	139	--	--	--	H	20.0		NHWRD 299
HTW 208	BEDROCK	--	--	38.0	--	9.0	06-15-87	H	10.0		NHWRD 104
HTW 217	BEDROCK	--	--	19.0	--	--	--	H	--		NHWRD 238
HTW 223	BEDROCK	--	--	41.0	--	--	--	H	1.50		NHWRD 204
HTW 230	BEDROCK	--	--	79.0	--	3.0	02-02-88	N	15.0		NHWRD 1
HTW 244	BEDROCK	--	--	40.0	--	--	--	H	.50		NHWRD 225
HTW 245	BEDROCK	--	--	39.0	--	--	--	H	20.0		NHWRD 327
HTW 248	--	--	--	--	--	54.8	07-23-80	--	--		--
HTW 249	--	--	--	--	--	55.2	--	--	--		--
HTW 250	--	--	--	--	--	35.3	07-23-80	--	--		--
HTW 251	--	--	--	--	--	--	--	--	--		--
HTW 252	--	--	--	--	--	71.7	07-23-80	--	--		--
HTW 253	--	--	--	--	--	38.0	07-23-80	--	--		--
HTW 254	--	--	--	--	--	93.5	07-23-80	--	--		--
HTW 255	--	--	--	--	--	16.7	07-23-80	--	--		--
HTW 258	--	--	--	--	--	9.82	07-23-80	--	--		--
HTW 259	--	--	--	--	--	14.8	07-23-80	--	--		--
HTW 260	--	--	--	--	--	22.2	07-23-80	--	--		--
HTW 262	--	--	--	--	--	19.9	07-23-80	--	--		--
HTW 263	--	--	--	--	--	44.8	07-23-80	--	--		--
HTW 264	--	--	--	--	--	44.1	07-23-80	--	--		--
HTW 265	112SRFD	--	--	--	--	6.30	02-20-86	P	--		--
HTW 268	112SRFD	--	--	--	--	--	--	P	--		--
HTW 269	--	--	--	--	--	--	--	--	--		--
						Rockingham County					
						Auburn					
AUA 1	112SRFD	--	--	--	--	--	--	U	--		USGS
AUA 2	112SRFD	--	--	--	--	--	--	U	--		USGS
AUA 3	112SRFD	--	--	--	--	--	--	U	--		USGS
AUA 4	112SRFD	--	--	--	--	--	--	U	--		USGS
AUB 1	--	--	--	--	--	5	-- -72	--	--		--

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Rockingham County--Continued						
			Auburn--Continued						
AUB 4	430037	0712341	NH Department of Transportation	1972	--	267	13	--	--
AUW 8	430100	0712113	Manchester, City of	--	D	290	8	8	--
AUW 11	425813	0711850	--	--	D	325	9	9	--
AUW 12	425820	0711902	Banks, F.	1964	D	335	22.5	22	--
AUW 31	425958	0711830	Manchester Water Works	1989	B	350	77	40	--
AUW 51	425741	0712019	Samson Construction	1984	--	300	--	167	--
AUW 57	425743	0712029	Cedar Cliff Builders Inc	1984	Z	300	--	275	--
AUW 58	425738	0712033	Samson Construction	1984	C	310	--	194	--
AUW 59	425740	0712032	Samson Construction	1984	C	310	--	277	--
AUW 66	425745	0712019	Samson Construction	1984	Z	310	--	250	--
AUW 76	425743	0712012	Samson Construction	1984	Z	290	--	122	--
AUW 77	425741	0712010	Samson Construction	1984	Z	290	--	264	--
AUW 78	425738	0712015	Samson Construction	1984	Z	280	--	183	--
AUW 79	425739	0712017	Samson Construction	1984	Z	290	--	289	--
AUW 83	425744	0712026	Samson Construction	1984	Z	310	--	205	--
AUW 86	425752	0712047	Roger	1984	Z	320	--	550	--
AUW 87	425930	0712033	Sargent	1984	Z	310	--	200	--
AUW 88	425713	0711921	Beck	1984	Z	340	--	160	--
AUW 89	425946	0712026	Goodrich, P.	1984	Z	290	--	220	--
AUW 100	430135	0712222	Pleasant Lake Development	1984	Z	310	--	260	--
AUW 111	425816	0711830	Roorda, A.	1985	Z	360	--	450	--
AUW 115	425806	0711940	Donnelly, B.	1985	Z	320	--	300	--
AUW 117	430051	0711845	Lambert, R.	1985	Z	350	--	285	--
AUW 120	430013	0711847	Aspee Construction	1985	Z	310	--	183	--
AUW 121	430116	0712228	Lambert, D.	1985	Z	280	--	407	--
AUW 122	430114	0712231	Gardner, E.	1985	Z	270	--	407	--
AUW 123	430019	0711851	Salinga	1985	Z	300	--	163	--
AUW 124	430017	0711847	Aspee Construction	1985	Z	310	--	142	--
AUW 125	430035	0711818	Carley, R.	1985	Z	390	--	360	--
AUW 153	430026	0711803	Buttonwood Builders	1985	Z	380	--	460	--
AUW 155	430038	0711822	Buttonwood Builders	1985	Z	390	--	365	--
AUW 158	430039	0711824	Buttonwood Builders	1985	Z	380	--	145	--
AUW 160	425730	0712056	Spruce Point Builders	1985	Z	310	--	360	--
AUW 164	425847	0711809	Buttonwood Builders	1985	Z	360	--	225	--
AUW 165	425856	0711815	Buttonwood Builders	1985	Z	350	--	125	--
AUW 166	425859	0711813	Buttonwood Builders	1985	Z	350	--	165	--
AUW 168	425853	0711758	Buttonwood Builders	1985	Z	360	--	280	--
AUW 171	425819	0711846	Burke, J.	1985	Z	320	--	300	--
AUW 172	425711	0712112	Nye Bros Construction	1985	Z	280	--	700	--
AUW 174	430140	0711938	Murphy	1985	Z	300	--	538	--
AUW 180	425808	0712007	Sullivan, M.	1986	Z	370	--	406	--

Local site number	Lat- itude	Long- itude	Owner or user	Year comp- leted	Method of con- struct- ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)

Rockingham County--Continued

Auburn--Continued

AUB 4	--	--	--	--	--	--	--	--	--	--
AUW 8	112TILL	36	R	8	--	2.2	06-11-69	H	--	--
AUW 11	112OTSH	60	R	9	--	7.05	08-14-68	H	--	--
AUW 12	112OTSH	24	R	22	--	17	08-14-68	H	--	Staus Pump
AUW 31	112SRFD	2	P	37.5	37.5	7.54	03-28-90	U	--	USGS
AUW 51	--	--	--	39.0	--	8.0	07-30-84	H	4.00	NHWRD 344
AUW 57	BEDROCK	--	--	79.0	--	--	--	H	6.00	NHWRD 299
AUW 58	BEDROCK	--	--	39.0	--	10.0	05-02-84	H	12.0	NHWRD 344
AUW 59	BEDROCK	--	--	52.0	--	8.0	05-03-84	H	3.00	NHWRD 344
AUW 66	BEDROCK	--	--	23.0	--	5.0	05-24-84	H	3.00	NHWRD 1
AUW 76	BEDROCK	--	--	19.0	--	28.0	08-30-84	H	18.0	NHWRD 344
AUW 77	BEDROCK	--	--	19.0	--	6.0	08-29-84	H	3.00	NHWRD 344
AUW 78	BEDROCK	--	--	28.0	--	9.0	08-07-84	H	4.00	NHWRD 344
AUW 79	BEDROCK	--	--	39.0	--	--	--	H	35.0	NHWRD 344
AUW 83	BEDROCK	--	--	67.0	--	20.0	07-09-84	H	15.0	NHWRD 344
AUW 86	BEDROCK	--	--	19.0	--	--	--	H	4.00	NHWRD 299
AUW 87	BEDROCK	--	--	40.0	--	--	--	H	3.00	NHWRD 205
AUW 88	BEDROCK	--	--	20.0	--	12.0	09-19-84	H	4.00	NHWRD 238
AUW 89	BEDROCK	--	--	59.0	--	20.0	10-15-84	H	6.00	NHWRD 549
AUW 100	BEDROCK	--	--	25.0	--	--	--	H	4.00	NHWRD 367
AUW 111	BEDROCK	--	--	19.0	--	25.0	09-24-85	H	2.00	NHWRD 205
AUW 115	BEDROCK	--	--	30.0	--	2.0	08-15-85	H	10.0	NHWRD 280
AUW 117	BEDROCK	--	--	28.0	--	14.0	08-23-85	H	4.50	NHWRD 344
AUW 120	BEDROCK	--	--	19.0	--	12.0	10-23-85	H	24.0	NHWRD 344
AUW 121	BEDROCK	--	--	19.0	--	3.0	12-16-85	H	--	NHWRD 344
AUW 122	BEDROCK	--	--	19.0	--	4.0	12-18-85	H	8.00	NHWRD 344
AUW 123	BEDROCK	--	--	19.0	--	14.0	11-07-85	H	50.0	NHWRD 344
AUW 124	BEDROCK	--	--	19.0	--	8.0	09-05-85	H	40.0	NHWRD 344
AUW 125	BEDROCK	--	--	19.0	--	--	--	H	2.00	NHWRD 204
AUW 153	BEDROCK	--	--	19.0	--	--	--	H	1.00	NHWRD 204
AUW 155	BEDROCK	--	--	29.0	--	--	--	H	2.00	NHWRD 204
AUW 158	BEDROCK	--	--	19.0	--	1.0	03-31-85	H	6.00	NHWRD 204
AUW 160	BEDROCK	--	--	19.0	--	5.0	09-08-85	H	1.50	NHWRD 204
AUW 164	BEDROCK	--	--	19.0	--	20.0	09-27-85	H	3.00	NHWRD 204
AUW 165	BEDROCK	--	--	29.0	--	8.0	03-03-85	H	20.0	NHWRD 204
AUW 166	BEDROCK	--	--	19.0	--	25.0	03-29-85	H	5.00	NHWRD 204
AUW 168	BEDROCK	--	--	19.0	--	20.0	09-05-85	H	3.00	NHWRD 204
AUW 171	BEDROCK	--	--	19.0	--	--	--	H	15.0	NHWRD 299
AUW 172	BEDROCK	--	--	39.0	--	--	--	H	3.00	NHWRD 299
AUW 174	BEDROCK	--	--	40.0	--	--	--	H	2.00	NHWRD 367
AUW 180	BEDROCK	--	--	19.0	--	18.0	05-28-86	H	4.00	NHWRD 344

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
			Rockingham County--Continued						
			Auburn--Continued						
AUW 181	430047	0711845	Mitchell, B.	1986	Z	370	--	406	--
AUW 184	425820	0711850	Begin, C.	1986	Z	320	--	205	--
AUW 186	425724	0712120	Fleet Maintenance	1986	Z	290	--	400	--
AUW 189	425725	0712114	Caron Construction	1986	Z	280	--	685	--
AUW 190	430130	0711938	Mullett, R.	1986	Z	290	--	300	--
AUW 196	425736	0712117	Nye Brothers	1986	C	310	--	406	--
AUW 197	425739	0712100	Nye Brothers	1986	C	320	--	285	--
AUW 199	425634	0712054	Bryant, R.	1986	C	300	--	224	--
AUW 214	430049	0711842	Beauchesne, R.	1987	Z	360	--	406	--
AUW 215	430025	0711753	Spruce Point Builders	1987	Z	380	--	400	--
AUW 218	425717	0712118	Daniels, R.	1987	Z	280	--	305	--
AUW 220	425753	0711944	Bobroff, B.	1987	Z	320	--	406	--
AUW 228	430043	0712254	Petti Devel	1987	Z	290	--	380	--
AUW 240	425943	0712257	Prescott, D.	1987	Z	330	--	223	--
AUW 241	425856	0711841	Hannaford, R.	1987	Z	360	--	406	--
AUW 244	430022	0711819	Jenkins, D.	1987	Z	410	--	265	--
AUW 247	425659	0712102	Auburn Pines Tennis Club	1987	Z	280	--	600	--
AUW 253	430129	0711945	Giovagnoli, D.	1988	Z	300	--	450	--
AUW 254	425726	0712115	Schibbelhute, P.	1988	Z	280	--	505	--
AUW 256	425946	0712301	Kucharczyk, J.	1988	Z	310	--	304	--
AUW 259	425706	0711911	CSJ Construction	1987	Z	340	--	345	--
AUW 260	425723	0712118	Caron Construction Co Inc	1988	Z	280	--	305	--
AUW 261	430018	0711807	Cavanaugh, W.	1989	Z	370	--	406	--
AUW 263	425802	0711934	Building Alternatives	1988	Z	320	--	550	--
AUW 264	430036	0711856	Towne, H.	1988	Z	310	--	380	--
AUW 273	425653	0712101	Marsden, D.	1988	Z	280	--	360	--
AUW 274	430033	0711748	Mahoney, S.	1988	Z	390	--	406	--
AUW 277	425838	0711832	Wood, D.	1988	Z	340	--	305	--
AUW 280	425811	0711820	Banks, N.	1988	C	330	--	220	--
AUW 281	430150	0712033	Voisine, R.	1989	Z	400	--	220	--
AUW 282	430030	0712051	Auburn Village Elem School	1987	Z	270	--	340	--
AUW 283	425920	0711931	Thorell, D.	1987	Z	430	--	280	--
			Candia						
CDW 19	430145	0711828	Bissonette, J.	1955	--	100	--	125	--
CDW 21	430319	0712150	Quimby, J.	1961	--	100	--	102	--
			Derry						
DFW 12	425626	0712047	Simard, George	1962	D	300	--	8.0	--

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)

Rockingham County--Continued

Auburn--Continued

AUW 181	BEDROCK	--	--	19.0	--	14.0	05-02-86	H	4.00	NHWRD 344
AUW 184	BEDROCK	--	--	20.0	--	--	--	H	9.00	NHWRD 1
AUW 186	BEDROCK	--	--	19.0	--	--	--	H	6.00	NHWRD 177
AUW 189	BEDROCK	--	--	49.0	--	--	--	H	1.00	NHWRD 208
AUW 190	BEDROCK	--	--	20.0	--	5.0	10-06-86	H	10.0	NHWRD 280
AUW 196	BEDROCK	--	--	19.0	--	30.0	10-25-86	H	4.25	NHWRD 344
AUW 197	BEDROCK	--	--	19.0	--	20.0	10-22-86	H	8.00	NHWRD 344
AUW 199	BEDROCK	--	--	19.0	--	12.0	11-11-86	H	10.0	NHWRD 344
AUW 214	BEDROCK	--	--	19.0	--	12.0	05-12-87	H	2.00	NHWRD 344
AUW 215	BEDROCK	--	--	19.0	--	15.0	03-06-87	H	1.50	NHWRD 344
AUW 218	BEDROCK	--	--	19.0	--	15.0	05-22-87	H	6.00	NHWRD 344
AUW 220	BEDROCK	--	--	19.0	--	12.0	06-02-87	H	4.50	NHWRD 344
AUW 228	BEDROCK	--	--	19.0	--	--	--	H	20.0	NHWRD 299
AUW 240	BEDROCK	--	--	39.0	--	25.0	10-14-87	H	15.0	NHWRD 344
AUW 241	BEDROCK	--	--	19.0	--	18.0	09-26-87	H	4.50	NHWRD 344
AUW 244	BEDROCK	--	--	24.0	--	28.0	10-23-87	H	25.0	NHWRD 344
AUW 247	BEDROCK	--	--	18.0	--	8.0	09-04-87	--	15.0	NHWRD 1
AUW 253	BEDROCK	--	--	40.0	--	12.0	04-21-88	H	50.0	NHWRD 126
AUW 254	BEDROCK	--	--	20.0	--	--	--	H	1.00	NHWRD 208
AUW 256	BEDROCK	--	--	39.0	--	30.0	05-06-88	H	7.00	NHWRD 344
AUW 259	BEDROCK	--	--	19.0	--	15.0	10-12-87	H	2.00	NHWRD 208
AUW 260	BEDROCK	--	--	39.0	--	20.0	02-02-88	H	3.00	NHWRD 208
AUW 261	BEDROCK	--	--	19.0	--	7.0	04-26-89	H	7.00	NHWRD 344
AUW 263	BEDROCK	--	--	20.0	--	--	--	H	15.0	NHWRD 299
AUW 264	BEDROCK	--	--	29.0	--	20.0	08-25-88	H	10.0	NHWRD 1
AUW 273	BEDROCK	--	--	18.0	--	--	--	C	12.0	NHWRD 1
AUW 274	BEDROCK	--	--	12.5	--	7.0	09-23-88	H	3.00	NHWRD 344
AUW 277	BEDROCK	--	--	39.0	--	18.0	11-14-88	H	9.00	NHWRD 344
AUW 280	BEDROCK	--	--	32.0	--	5.0	11-19-88	H	5.00	NHWRD 940
AUW 281	BEDROCK	--	--	19.0	--	--	--	H	20.0	NHWRD 299
AUW 282	BEDROCK	--	--	80.0	--	--	--	T	30.0	NHWRD 367
AUW 283	BEDROCK	--	--	60.0	--	--	--	H	5.00	NHWRD 367

Candia

CDW 19	BEDROCK	--	--	--	--	--	--	--	--	Dube, O.
CDW 21	BEDROCK	--	--	10	--	--	--	--	--	Kosiba, S.

Derry

DFW 12	1120TSH	36.0	--	--	--	4.04	06-28-62	H	--	--

Local site number		Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)
				Rockingham County--Continued						
				Londonderry						
LRA	9	425551	0712100	Londonderry, Town of	1982	B	310	7.5	--	7.5
LRA	10	425553	0712057	Londonderry, Town of	1982	B	310	22.0	--	22.0
LRW	41	425521	0712051	Marquis, H.	1962	D	335	--	8.3	8
LRW	60	425614	0712236	Beale, William	1956	--	265	--	100	--
LRW	71	425621	0712120	Derry, Town of	1973	--	260	33	33	--
LRW	73	425610	0712120	Londonderry, Town of	1982	B	270	15.0	13.9	15.0
LRW	74	425554	0712054	Londonderry, Town of	1982	B	285	15.0	9.2	--
LRW	75	425556	0712106	Londonderry, Town of	1982	B	285	30.2	17.5	20.2
LRW	76	425601	0712107	Londonderry, Town of	1982	B	275	30.0	28.3	--
LRW	77	425601	0712102	Londonderry, Town of	1982	B	280	25.0	24.2	--
LRW	78	425607	0712106	Londonderry, Town of	1982	B	285	52.5	18.0	52.5
LRW	127	425620	0712224	Advanced Builders	1986	Z	240	--	585	--
LRW	128	425612	0712228	Advanced Builders	1986	Z	270	--	585	--
LRW	129	425612	0712224	Advanced Builders	1986	Z	270	--	505	--
LRW	130	425601	0712135	NR Construction	1984	Z	340	--	185	--

Local site number	Lat-itude	Long-itude	Owner or user	Year comp-leted	Method of con-struct-ion	Elevation above NGVD of 1929 (feet)	Depth of hole (feet)	Depth of well (feet)	Depth to bedrock or refusal (feet)

Rockingham County--Continued

Londonderry

LRA 9	--	--	--	--	--	--	--	U	--	Guild	
LRA 10	--	--	--	--	--	--	--	U	--	Guild	
LRW 41	112SRFD	48.0	--	--	--	5.11	06-26-62	H	--		--
LRW 60	BEDROCK	6.0	--	--	--	--	--	H	4.50		--
LRW 71	--	2.5	--	33	--	--	--	U	30	CDM	
LRW 73	112SRFD	2.5	P	3.9	3.9	3.6	07-20-82	U	--	Guild	
LRW 74	112SRFD	2.5	P	1.0	1.0	3.2	07-21-82	U	--	Guild	
LRW 75	112TILL	2.5	P	7.5	7.5	3.04	07-27-82	U	--	Guild	
LRW 76	112SRFD	2.5	P	18.3	18.3	.05	07-29-82	U	--	Guild	
LRW 77	112TILL	2.5	--	14.2	14.2	2.65	08-02-82	U	--	Guild	
LRW 78	112SRFD	2.5	--	8.0	8.0	7.8	08-19-82	U	--	Guild	
LRW 127	BEDROCK	--	--	54.0	--	--	--	H	2.00	208	
LRW 128	BEDROCK	--	--	39.0	--	30	12-23-86	H	6.00	208	
LRW 129	BEDROCK	--	--	39.0	--	--	--	H	5.00	208	
LRW 130	BEDROCK	--	--	44.0	--	20.0	04-26-84	H	4.00	94	

APPENDIX B

Appendix B.--Stratigraphic logs of selected wells and borings

Local site number: First two characters are U.S. Geological Survey town code. Third character indicates--A, auger hole; B, highway bridge boring; W, well. The numbers are sequential numbers for each town.

Depth to top: Depth to top of unit, in feet below land-surface datum.

Depth to bottom: Depth to bottom of unit, in feet below land-surface datum.

Primary aquifer code: Primary aquifer code of well or boring; codes for geologic ages and materials are listed below.

110SDMN, Quaternary sediment, undifferentiated
111ALVM, Holocene alluvium
111SWMP, Holocene swamp deposits
111FILL, Holocene fill (artificial fill)
112OTSH, Pleistocene outwash
112LCSR, Pleistocene lacustrine deposits
112SRFD, Pleistocene stratified drift
112TILL, Pleistocene till
BEDROCK, Bedrock

Abbreviations: EOH, end of hole; pred., predominantly

Appendix B. Stratigraphic logs of selected wells and borings
[--,no data; EOH, end of hole; ft, feet]

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Hillsborough County
					Bedford
BIA	1	0	20	112SRFD	Sand, fine to medium; some sand, very coarse
		20	--	BEDROCK	Bedrock
BIA	2	0	20	110SDMN	Sand, coarse; grading to sand, very fine
		20	25	112SRFD	Sand, very fine, clay and silt
		25	30	112TILL	Till
BIA	3	0	20	112SRFD	Sand fine to very coarse; pred. sand, coarse
		20	29	112SRFD	Clay and silt
		29	43	112TILL	Till, sandy
		43	--	BEDROCK	Bedrock
BIA	4	0	28	112SRFD	Sand, medium to very coarse; pred. sand, medium to coarse
		28	58	112SRFD	Sand, very fine
		58	62	112TILL	Till
		62	--	BEDROCK	Bedrock
BIB	1	0	5	111SWMP	Muck, silty
		5	10	111SWMP	Muck, sandy
		10	15	110SDMN	Sand, gravelly
		15	20	110SDMN	Silt and fine sand
		20	--	110SDMN	Sand and gravel, silty; EOH at 25 ft
BIB	2	0	8	110SDMN	Sand, medium to coarse; sharp
		8	19	110SDMN	Silt; some gravel, fine
		19	--	110SDMN	Gravel; EOH at 25 ft
BIB	3	0	11	110SDMN	Sand, some gravel
		11	17	110SDMN	Silt, some sand
		17	--	110SDMN	Gravel; refusal at 19 ft
BIB	4	0	7	110SDMN	Sand and gravel, silty
		7	25	110SDMN	Clay and silt
		25	30	110SDMN	Silt, trace clay
		30	48	110SDMN	Clay and silt
		48	--	110SDMN	Sand; refusal at 51 ft
BIB	5	0	8	110SDMN	Silt and fine sand
		8	43	110SDMN	Clay and silt
		43	48	110SDMN	Silt, some sand and gravel
		48	--	112SRFD	Sand and gravel; refusal at 57 ft; 15 ft rock cored
BIB	6	0	20	110SDMN	Sand, fine
		20	35	110SDMN	Silt and fine sand
		35	42	110SDMN	Clay and silt
		42	--	110SDMN	Sand, fine; gray; EOH at 81 ft

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Hillsborough County--Continued
					Bedford--Continued
BIB	8	0	7	110SDMN	Sand, fine to coarse
		7	--	110SDMN	Sand and gravel, silty; refusal at 12 ft
BIB	9	0	4	110SDMN	Sand, fine; gravel
BIB	9	4	--	110SDMN	Sand, fine to medium; refusal at 6 ft
BIB	10	0	6	111SWMP	Muck
		6	7	110SDMN	Sand, fine to coarse
		7	30	110SDMN	Clay and silt
		30	35	110SDMN	Silt and fine sand
		35	--	BEDROCK	Bedrock; EOH at 54 ft
BIB	11	0	7	110SDMN	Sand, gravelly
		7	25	110SDMN	Clay and silt
		5	30	110SDMN	Silt, clayey
		30	35	110SDMN	Silt and sand
		35	--	112TILL	Till; refusal at 39 ft
BIB	12	0	5	110SDMN	Sand, fine to coarse
		5	9	110SDMN	Sand and gravel
		9	--	110SDMN	Sand, silty and gravel; refusal at 15 ft
BIW	4	0	--	112OTSH	Sand, very fine to fine
BIW	8	0	4	112SRFD	Sand and gravel; some boulders
		4	10	112SRFD	Silt and fine sand
		10	--	BEDROCK	Bedrock; EOH at 12.5 ft
BIW	11	0	27	112SRFD	Sand, medium
		27	40	112SRFD	Sand, very fine grading to sand, coarse
		40	44	112SRFD	Sand, coarse
		44	--	BEDROCK	Bedrock
BIW	12	0	65	112SRFD	Sand, very fine to very coarse; pred. tan sand, medium
		65	68	112TILL	Till
		68	--	BEDROCK	Bedrock
BIW	14	0	27	112SRFD	Sand, very fine to very coarse; pred. tan sand, coarse
		27	40	112SRFD	Sand, very fine to medium; pred. tan sand, fine
		40	76	112SRFD	Clay and silt; gray
		76	--	BEDROCK	Bedrock
BIW	17	0	75	112SRFD	Silt and very fine sand; pred. sand, very fine
		75	--	BEDROCK	Bedrock
BIW	18	0	35	112SRFD	Sand, fine to medium; pred. fine sand
		35	--	112TILL	Till; refusal at 39 ft
BIW	19	0	10	112SRFD	Tan sand, coarse
		10	45	112SRFD	Clay, gray

Appendix B. Stratigraphic logs of selected wells and borings--Continued

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Hillsborough County--Continued
					Bedford--Continued
		45	50.5	112SRFD	Sand, medium to coarse sand
		50.5	--	BEDROCK	Bedrock
					Deering
DEW	3	0	23	110SDMN	--
		23	--	BEDROCK	--
					Francestown
FCW	3	0	20	112SRFD	Sand, medium, tan; ranges from sand, fine to coarse
FCW	3	20	35	112SRFD	Sand, medium to coarse, pred.
		35	54	112SRFD	Sand, fine to medium
					Goffstown
GNA	1	0	--	112SRFD	Sand, very coarse; cobble gravel
GNA	3	0	10	112SRFD	Sand and gravel; very cobbly
		10	--	112TILL	Till; refusal at 20 ft
GNB	1	0	--	110SDMN	Sand and gravel; refusal at 14 ft
GNB	2	0	3	111FILL	Bedrock
		3	6	112SRFD	Sand and gravel; hard, coarse
		6	8	112TILL	Till
		8	--	BEDROCK	--
GNB	3	0	10	110SDMN	Gravel
		10	--	110SDMN	Sand and gravel; EOH at 25 ft
GNB	4	0	9	112SRFD	Gravel
		9	--	BEDROCK	Bedrock
GNW	1	0	40	112OTSH	Sand, fine to medium
		40	--	112OTSH	Sand; EOH at 40 ft
GNW	2	0	41	112SRFD	Sand and gravel; EOH at 41 ft
GNW	4	0	43	112SRFD	Sand, fine to very coarse to fine gravel
		43	44	112SRFD	Sand, very fine to fine
		44	--	BEDROCK	Bedrock

Local site number	Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
				Hillsborough County--Continued
				Goffstown--Continued
GNW 7	0	30	112SRFD	Sand, coarse, some very coarse sand
	30	40	112SRFD	Sand, fine, grading to sand, very fine
	40	--	112TILL	Till
GNW 8	0	35	112SRFD	Sand, coarse to very coarse; some finer layers
	35	39	112SRFD	Sand, fine to medium
	39	--	BEDROCK	Bedrock
GNW 9	0	--	112SRFD	Sand, coarse; some finer bands
GNW 14	0	10	112SRFD	Sand, coarse, tan, clean
	10	20	112SRFD	Sand, medium, tan, clean
	20	30	112TILL	Till, sandy; clay and angular pebbles within
	30	59	112SRFD	Sand, very coarse; some finer layers
	59	--	112TILL	EOH at 66 ft in till
GNW 15	0	40	112SRFD	Sand, coarse to very coarse; variable thin layers
	40	54.5	112TILL	Till, sandy
	54.5	--	BEDROCK	Bedrock
GNW 16	0	33	112SRFD	Sand, coarse; variable finer lenses
	33	49	112TILL	Till, sandy
	49	--	BEDROCK	Bedrock
GNW 17	0	30	112SRFD	Sand, coarse; some sand, very coarse
	30	--	112SRFD	Sand, fine to medium; well sorted; EOH at 62 ft
				Greenfield
GSW 101	0	34	112SRFD	Sand, medium to coarse; some lenses of both finer and coarser sand
	34	--	112TILL	Till; refusal at 47 ft
GVB 1	0	2.5	112SRFD	Sand, loamy, hard; little gravel
	2.5	8	112SRFD	Sand, coarse, hard; some gravel and boulders
	8	15.5	112SRFD	Clay, hard, some sand and gravel
	15.5	19	112TILL	Clay, hard, sand, gravel; hardpan
	19	--	BEDROCK	Refusal on boulder or bedrock
				Manchester
MCB 1	0	20	111FILL	Fill, sand and wood
	20	--	BEDROCK	Bedrock; EOH at 51 ft

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Hillsborough County--Continued
					Manchester--Continued
MCB	3	0	30	110SDMN	Sand, medium, yellow, clean
		30	35	110SDMN	Silt
		35	--	112TILL	Till; EOH at 37 ft
MCB	4	0	2	111FILL	Sand and gravel
		2	11	110SDMN	Sand, fine, peaty
		11	16	110SDMN	Silt and fine sand
		16	--	110SDMN	Sand, coarse and gravel
MCB	6	0	27	111FILL	Fill
		27	30	110SDMN	Sand, yellow, loose
		30	--	110SDMN	Sand and gravel; refusal at 35 ft
MCB	7	0	6	111FILL	Fill
		6	16	110SDMN	Sand, fine, loose
		16	--	110SDMN	Sand, medium and gravel
MCB	9	0	8.5	110SDMN	Sand; finer toward bottom
		8.5	--	BEDROCK	Bedrock; EOH at 23 ft
MCB	10	0	17	110SDMN	Sand, fine
		17	20	110SDMN	Sand, coarse
		20	26	110SDMN	Gravel
		26	40	110SDMN	Sand, fine
		40	--	110SDMN	Gravel; refusal at 42 ft
MCB	12	3	14	110SDMN	Sand and gravel
		14	44	110SDMN	Silt and fine sand
		44	--	110SDMN	Gravel; refusal at 52 ft
MCB	13	0	12	110SDMN	Sand, fine
		12	--	110SDMN	Sand and gravel, silty; refusal at 40 ft
MCB	14	2	23	110SDMN	Sand, fine
		23	33	110SDMN	Gravel
		33	--	BEDROCK	Bedrock; EOH at 46 ft
MCB	15	0	4	111FILL	Fill
		4	44	110SDMN	Silt and very-fine sand; stratified
		44	57	110SDMN	Gravel and boulders
MCB	15	57	--	112TILL	Till; refusal at 60 ft
MCB	16	0	21	110SDMN	Sand, fine to medium
		21	--	110SDMN	Silt and sand; EOH at 90 ft
MCB	17	0	11	110SDMN	Sand, very fine, dry
		11	25	110SDMN	Gravel
		25	--	110SDMN	Silt and fine sand; gray; refusal at 34 ft

Local site number	Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
				Hillsborough County--Continued
				Manchester--Continued
MCB 18	0	15	110SDMN	Sand, fine to medium
	15	20	110SDMN	Gravel
	20	31	110SDMN	Silt and very fine sand; wet, gray
	31	--	110SDMN	Gravel; refusal at 35 ft
MCB 20	0	11	110SDMN	Silt and sand; some organic material
	11	29	110SDMN	Silt and fine sand
	29	--	110SDMN	Gravel, silty
MCB 21	0	7	111SWMP	Muck
	7	12	110SDMN	Silt and fine sand
	12	25	110SDMN	Gravel
MCB 22	0	37	110SDMN	Sand, very fine
	7	44	110SDMN	Sand, fine
	44	54	110SDMN	Sand, medium, sharp
	54	--	112TILL	Till; EOH at 58 ft
MCB 23	0	12	110SDMN	Sand, fine
	12	48	110SDMN	Sand, fine; compact
	48	--	110SDMN	Gravel? till? EOH at 57 ft
MCB 24	0	16	110SDMN	Sand, fine; trace silt
	16	18	110SDMN	Gravel
	18	22	112TILL	Till; refusal at 22 ft
MCB 26	0	11	110SDMN	Sand, fine to coarse; some gravel
	11	--	110SDMN	Silt and sand, gravel, boulders
MCB 27	0	4	110SDMN	Sand, medium to coarse
	4	13	110SDMN	Sand, medium; silt layers
	13	29	110SDMN	Sand, fine; silt
	29	--	110SDMN	Sand; hardpan
MCB 29	0	2	110SDMN	Gravel, sandy
	2	--	BEDROCK	Bedrock
MCB 38	0	16	110SDMN	Sand, fine
	16	47	110SDMN	Gravel, fine
	47	54	112TILL	Till, gravelly
	--	--	BEDROCK	Bedrock
MCB 39	0	11	110SDMN	Sand, fine
	11	27	110SDMN	Sand, medium to coarse
MCB 39	27	--	112TILL	Till, gravelly; refusal at 33 ft
MCB 40	0	5	110SDMN	Sand and gravel
	5	13	110SDMN	Sand and gravel, silty
	13	--	BEDROCK	Bedrock; EOH at 31 ft

Hillsborough County--Continued

Manchester--Continued

Local site number	Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
MCB 41	0	5	111SWMP	Muck
	5	8	112SRFD	Gravel
	8	19	112SRFD	Sand and gravel, silty
	19	21	112SRFD	Boulder
	21	22	112SRFD	Sand and gravel, silty; refusal at 22 ft
MCB 42	0	5	111SWMP	Muck
	5	10	110SDMN	Sand, coarse
	10	19	110SDMN	Sand, fine
	19	27	110SDMN	Silt
	27	--	110SDMN	Gravel, sandy; refusal at 34 ft
MCB 43	0	5	110SDMN	Sand, gravelly
	5	11	110SDMN	Silt, sandy
	11	15	110SDMN	Sand, fine; silty
	15	25	110SDMN	Sand, fine to medium, uniform
	25	40	110SDMN	Sand, fine; silty
	40	41	110SDMN	Sand, fine to medium
	41	46	110SDMN	Sand and gravel, silty, gravelly
	46	--	BEDROCK	Bedrock; mica schist; EOH at 50 ft
MCB 44	0	4	110SDMN	Sand, coarse
	4	12	110SDMN	Gravel
	12	--	112TILL	Till; refusal at 24 ft
MCB 45	0	10	110SDMN	Sand and gravel
	10	20	110SDMN	Sand, coarse
	20	25	110SDMN	Sand, medium to coarse
	25	40	110SDMN	Sand, fine
	40	45	110SDMN	Sand, medium to coarse
	45	50	110SDMN	Silt and fine sand
	50	--	112TILL	Till; EOH at 57 ft
MCB 46	0	9	110SDMN	Sand and gravel, silty
	9	--	BEDROCK	Bedrock --
MCB 47	0	6	111SWMP	Muck
	6	14	110SDMN	Sand, medium to coarse
	14	25	110SDMN	Sand, fine, gray
	25	33	110SDMN	Silt and fine sand
	33	46	110SDMN	Sand, fine
	46	52	112TILL	Till, sandy; refusal at 52 ft
MCB 48	14	17	110SDMN	Sand, fine

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Hillsborough County--Continued
					Manchester--Continued
		17	38	110SDMN	Sand, medium to coarse
		38	--	112TILL	Till, gravelly
		40	--	BEDROCK	Bedrock
MCB	49	0	24	110SDMN	Gravel
		24	--	112TILL	Till, gravelly; refusal at 29 ft
MCB	50	0	5	110SDMN	Sand, fine; trace silt
		5	12	110SDMN	Sand, fine to medium
		12	--	112TILL	Till, sandy; refusal at 17 ft
MCB	51	0	4	110SDMN	Sand and gravel, silty, boulders
		4	--	BEDROCK	Bedrock
MCB	52	0	14	110SDMN	Gravel
		14	24	110SDMN	Sand
		24	40	110SDMN	Gravel
		40	48	110SDMN	Sand
		48	--	112TILL	Till, gravelly; refusal at 68 ft
MCB	53	0	10	111FILL	Gravel fill
		10	--	BEDROCK	Bedrock
MCB	54	0	7	111FILL	Sand and gravel fill
		7	--	BEDROCK	Bedrock
MCB	55	0	12	110SDMN	Sand and gravel
		12	--	112TILL	Till, sandy; refusal at 21 ft
MCB	58	0	12	111FILL	Sand and gravel fill
		12	--	112TILL	Till; refusal at 26 ft
MCB	59	0	15	111FILL	Fill
		15	--	112TILL	Till; refusal at 30 ft
MCW	3	0	--	112OTSH	Sand
MCW	6	0	3.5	111FILL	landfill
		17	44	112SRFD	Sand, fine, brown; trace silt
		44	--	112SRFD	Sand, very fine, brown; silt; EOH at 61 ft
MCW	7	0	8	111FILL	landfill
		8	12	112SRFD	Sand, fine, brown; little silt
		12	18	112SRFD	Sand, fine to medium, brown; trace silt
		18	--	112SRFD	Sand, fine to coarse, red-brown; trace silt; EOH at 20.6 ft
MCW	8	0	9	112SRFD	Sand, fine to coarse, brown; trace silt
		9	11	112SRFD	Sand, fine to medium, brown
		11	23.5	112SRFD	Sand, fine to coarse, brown; some gravel
		23.5	--	BEDROCK	Bedrock; weathered Schist; EOH at 34 ft
MCW	9	0	3.5	111FILL	Landfill

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Hillsborough County--Continued
					Manchester--Continued
		3.5	12.5	112SRFD	Sand, fine to medium, brown; trace gravel, fine
MCW	9	12.5	23	112SRFD	Sand, fine to coarse, brown; gravel, fine to medium
		23	--	BEDROCK	Granite to gneiss; EOH at 33 ft
MCW	10	0	9.5	111FILL	landfill
		9.5	12.5	112SRFD	Sand, fine, brown; some silt
		12.5	17	112SRFD	Sand, fine to medium, brown; little gravel; trace silt
		17	--	BEDROCK	Bedrock; granite to gneiss; EOH at 55 ft
MCW	11	0	68	111FILL	Landfill
		68	74	112SRFD	Sand, very fine, black gray
		74	--	112SRFD	Sand, fine, light brown; some silt; EOH at 91 ft
					Mason
MGA	1	0	10	112SRFD	Sand, medium
		10	19	112TILL	Till
		19	--	BEDROCK	Bedrock
MGW	1	0	17	112SRFD	Sand, fine
		43.5	--	BEDROCK	Bedrock refusal
					New Boston
NCA	1	0	95	112SRFD	Silt; some sand, very fine
		95	97	112TILL	Till
		97	--	BEDROCK	Bedrock
NCA	8	0	15	112LCSR	Very fine to medium
		0	55	112LCSR	Silt and clay
		55	60	112TILL	Silty
		60	--	BEDROCK	Refusal at 60 ft
NCA	10	0	14	112SRFD	Sand and gravel
		14	--	112TILL	Till; refusal at 14 ft
NCA	99	0	15	110SDMN	Fill over fine sand and silt
		15	--	BEDROCK	Bedrock
NCB	1	0	18	112SRFD	Sand and gravel; EOH at 18 ft
NCB	2	0	18	112SRFD	Sand, fine to coarse, gravel, brown
		18	--	112TILL	Till; EOH at 35.5 ft

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Hillsborough County--Continued
					New Boston--Continued
NCB	3	0	18	112SRFD	Sand, fine to medium and gravel
		18	23	112TILL	Till, sandy, dense
		23	--	BEDROCK	Bedrock; EOH at 28 ft
NCB	4	0	25	112SRFD	Sand, fine to medium; trace sand, coarse
		25	--	112TILL	Till; EOH at 28 ft
NCB	5	0	17	112SRFD	Sand, fine to medium and gravel
		17	9	112SRFD	Silt, clayey, trace sand, fine
		19	26	112TILL	Till, sandy, dense
		26	--	BEDROCK	Bedrock; EOH at 31 ft
NCW	4	0	--	111ALVM	Sand and gravel
NCW	5	0	10	110SDMN	Till
		10	--	BEDROCK	Bedrock; Littleton Formation
NCW	8	0	48	112OTSH	Sand, medium, tan with coarse to very coarse lenses
		48	55	112OTSH	gray, sand, medium with coarse to very coarse lenses
		55	83	112OTSH	Sand, tan with coarse to very coarse lenses
		83	--	112TILL	Till; tight, compact
					New Ipswich
NJA	1	0	7	112SRFD	Sand, medium
		7	24	112SRFD	Silt, gray
		24	32	112TILL	Till
		32	--	BEDROCK	Bedrock
NJW	1	0	58.5	111FILL	Sand, fine to medium, alternating bands of finer/coarser
		5	--	112SRFD	Till; refusal at 67 ft
		15	--	112SRFD	Sand
		48	--	112SRFD	Sand
		58.5	--	112TILL	Till
NJW	3	0	33	112SRFD	Sand, medium, some fine to very coarse
		33	43	112SRFD	Sand, fine, well sorted
		43	53	112TILL	Till
		53	--	112SRFD	Sand, coarse to very coarse, some fine sand
NJW	4	--	30	112SRFD	Sand, medium, tan, some coarser lenses
		30	40	112SRFD	Sand, coarse
		40	63.6	112SRFD	Sand, fine to medium, pred., some variable thin layers
		63.6	--	112TILL	Till; refusal at 68 ft

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Hillsborough County--Continued
					New Ipswich--Continued
NJW	5	0	53	112SRFD	Sand, very fine to fine; some silt, some sand, medium
		53	--	112TILL	Till; refusal at 64 ft
					Temple
TMA	1	0	22	112SRFD	Sand, very fine, uniform
		22	--	112TILL	Till; EOH at 42 ft
					Weare
WGA	1	--	10	112SRFD	Sand, medium
		10	--	112TILL	Till; EOH at 12.5 ft
WGW	1	0	25	112TILL	Till
		25	--	BEDROCK	Bedrock
WGW	11	0	--	112TILL	Till
WGW	17	0	13	112SRFD	Sand, coarse, poorly sorted
		13	30	112SRFD	Sand, medium, poorly sorted
		30	--	112TILL	Till; refusal at 35 ft
WGW	18	0	60	112SRFD	Silt to very fine sand
		60	69	112SRFD	Sand, very fine, clay and silt
		69	75	112SRFD	Sand, very coarse to fine gravel
		75	82	112SRFD	Sand, fine, some clay and silt
		82	--	112TILL	Till; refusal at 91 ft
WGW	19	0	20	112SRFD	Sand, coarse, muck on top
		20	25	112SRFD	Sand, medium, gray; some sand, coarse in thin lenses
WGW	19	25	35	112SRFD	Sand, coarse, tan; anglular
		35	40	112SRFD	Sand, very fine to fine, tan
		40	45	112SRFD	Sand, coarse, with some finer lenses
		45	58	112SRFD	Sand, fine, with coarse lenses, thin
		58	--	112TILL	Till; refusal at 61 ft
WGW	20	0	--	112SRFD	Gravel, fine, boulders; refusal at 35 ft
WGW	21	0	24	112SRFD	Sand, medium
		24	42	112SRFD	Sand, very fine to fine
		42	60	112TILL	Till, sandy
		60	89	112SRFD	Sand, fine to medium
		89	--	112TILL	Till; EOH at 99 ft

Appendix B. Stratigraphic logs of selected wells and borings

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Merrimack County
					Allenstown
ATA	1	0	--	112TILL	Till, compact at 23 ft; EOH at 27 ft
ATA	2	0	--	112TILL	Till, gray, clayey; EOH at 24 ft
					Bow
BUW	8	0	50	112SRFD	Sand, very fine to medium; pred. sand, fine
		50	68	112SRFD	Sand, very coarse to pebbles; pred. sand, coarse
		68	--	BEDROCK	Bedrock
BUW	9	0	17	112SRFD	Sand, very fine to medium; pred. fine sand
		17	37	112SRFD	Sand, medium to very coarse; pred. medium sand
		37	83	112SRFD	Sand, very fine to medium; pred. very fine to fine sand
		83	--	112TILL	Refusal in till
					Hooksett
HTA	1	0	10	112SRFD	Sand, coarse
		10	--	112TILL	Till; refusal at 23 ft
HTA	2	0	--	112TILL	Refusal at 10 ft
HTA	3	0	50	112SRFD	Sand, very fine to fine; pred. very fine sand
		50	80	112SRFD	Sand, very fine to medium; pred. fine sand
		80	105	112SRFD	Sand, very fine to fine; pred. very fine sand
		105	114	112TILL	Till
		114	--	112TILL	Refusal on till
HTA	4	0	22	112SRFD	Sand, fine to medium; pred. fine sand
		22	27	112SRFD	Sand, fine to medium; pred. medium sand
		27	39	112SRFD	Sand, very fine to medium; pred. fine sand
		39	69	112SRFD	Sand, very fine to fine; pred. very fine sand
		69	75	112TILL	Till
		75	--	112TILL	Refusal on till
HTB	1	0	30	110SDMN	Silt and fine sand
		30	--	110SDMN	Sand, medium; gravel, fine; EOH at 40 ft
HTB	3	0	6	110SDMN	Gravel and boulders
		6	8	110SDMN	Sand, fine with silt layers
		18	--	110SDMN	Gravel and boulders; EOH at 33 ft
HTB	4	0	10	110SDMN	Gravel
HTB	4	10	38	110SDMN	Sand, medium to coarse

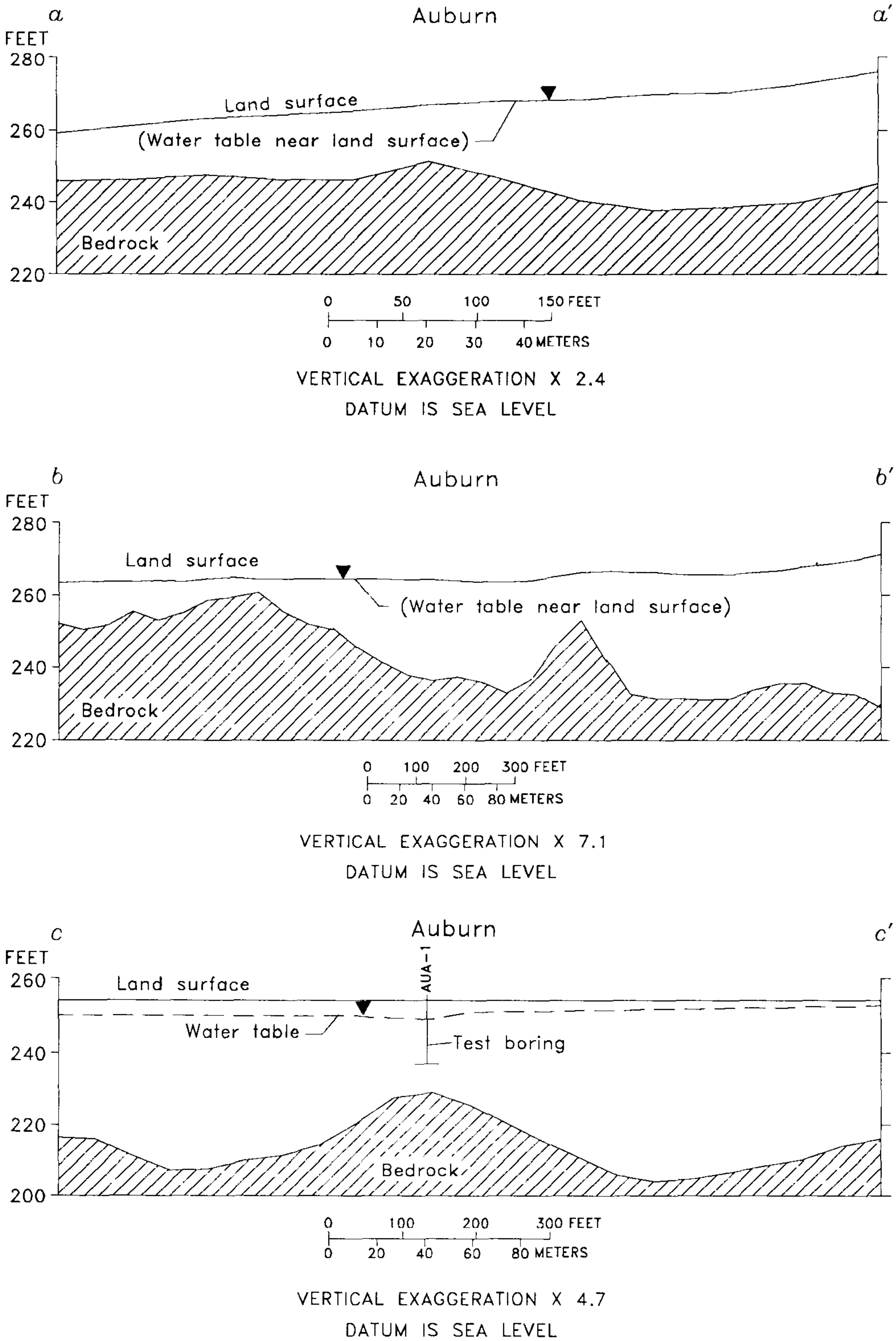
Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Merrimack County--Continued
					Hooksett--Continued
		38	--	110SDMN	Sand, fine; EOH at 62 ft
HTB	5	0	35	110SDMN	Sand and gravel
		35	--	110SDMN	Sand, fine to coarse stratified sand; EOH at 60 ft; dry
HTB	8	0	10	110SDMN	Sand, fine
		10	30	110SDMN	Sand, medium to coarse
		30	--	BEDROCK	Cored rock; EOH at 45 ft
HTB	9	0	18	110SDMN	Sand, fine
		18	52	110SDMN	Gravel, fine
		52	--	112TILL	Bouldery till; refusal at 62 ft
HTB	10	0	5	110SDMN	Sand
		5	--	110SDMN	Gravel, sandy; refusal at 23 ft
HTB	11	0	6	112SRFD	Gravel; open test pit
		6	--	BEDROCK	Bedrock
HTB	14	0	2	111SWMP	Muck
		2	4	110SDMN	Silt, clayey
		4	8	110SDMN	Till; unsorted sand
		8	15	110SDMN	Sand, silty
		15	17	110SDMN	Silt, clayey
		17	--	110SDMN	Sand, unsorted
HTB	15	0	5	111FILL	Sand fill
		5	--	112TILL	Till, sandy; refusal at 60 ft
HTB	16	21	26	110SDMN	Gravel
		26	--	112TILL	Till, sandy; refusal at 33 ft
HTB	17	0	18	110SDMN	Sand
		18	--	112TILL	Till, sandy; refusal at 29 ft
HTW	1	0	40	112OTSH	Sand and gravel
HTW	2	0	--	112OTSH	Sand and gravel
HTW	3	0	48	112OTSH	Sand and gravel
		48	--	BEDROCK	Bedrock
HTW	4	0	74.5	112SRFD	Sand, fine to medium
		74.5	78.5	112SRFD	Sand and gravel
		78.5	85	112SRFD	Sand, fine to medium
		85	90	112SRFD	Sand and gravel
HTW	6	0	--	112SRFD	Rocks and boulders
HTW	7	0	--	112SRFD	Gravel; sharp, broken; brown
HTW	8	0	21	110SDMN	Sand, coarse and gravel; brown
		21	28	110SDMN	Sand, medium; brown
		28	49	110SDMN	Sand and gravel; brown

Local site number	Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
				Merrimack County--Continued
				Hooksett--Continued
	49	--	110SDMN	Sand, coarse and gravel; brown; refusal at 68 ft
HTW 9	0	21	112SRFD	Clay, gray
	21	35	112SRFD	Sand and gravel; brown, sharp
	35	49	112SRFD	Sand and gravel, reddish brown
	49	--	112SRFD	Gravel, brown; refusal at 63 ft
HTW 10	0	28	112SRFD	Gravel, brown; clay
	28	42	112SRFD	Sand, coarse, brown and gravel
	42	54	112SRFD	Sand, coarse, brown
	54	--	112SRFD	Silt and fine sand; EOH at 56 ft
HTW 11	0	21	112SRFD	Clay and gravel
	21	28	112SRFD	Sand, fine to medium, brown
	28	42	112SRFD	Sand, brown
	42	--	112SRFD	Silt and fine sand; refusal at 56 ft
HTW 12	0	21	110SDMN	Clay and gravel
	21	--	110SDMN	Sand, fine to medium and gravel; refusal at 28 ft
HTW 13	0	--	112SRFD	Gravel; EOH at 28 ft
HTW 14	0	28	110SDMN	Gravel grading to sand, fine to coarse with depth
	28	--	110SDMN	Sand, fine to coarse; EOH at 35 ft
HTW 15	0	30	110SDMN	Sand, medium to very coarse; pred. tan sand, coarse
	30	100	112SRFD	Sand, very fine to fine; pred. sand, fine
	100	--	112SRFD	Sand, fine to coarse; pred. sand, medium; EOH at 143 ft
HTW 16	0	60	112SRFD	Silt and sand, gray
	60	--	112SRFD	Sand, very fine to medium; pred. tan fine sand; EOH at 140 ft
HTW 17	0	19	112SRFD	Sand, coarse and cobbles
	19	29	112SRFD	Sand, fine to very coarse; pred. medium sand
	29	49	112SRFD	Sand, medium to very coarse; pred. coarse sand
	49	59	112SRFD	Sand, fine to very coarse; pred. medium sand
	59	75	112SRFD	Sand, fine to very coarse; pred. medium to coarse sand
	75	77	112TILL	Till
	77	--	112TILL	Refusal in till
HTW 18	0	29	112SRFD	Sand, fine to medium; pred. fine sand
	29	34	112SRFD	Sand, fine to very coarse; pred. medium sand
	34	39	112SRFD	Sand, very fine to medium; pred. fine sand
	39	46	112SRFD	Sand, very fine to very coarse; pred. medium sand
	46	--	112TILL	Refusal in till
HTW 19	0	25	112SRFD	Sand, very coarse to pebbly gravel

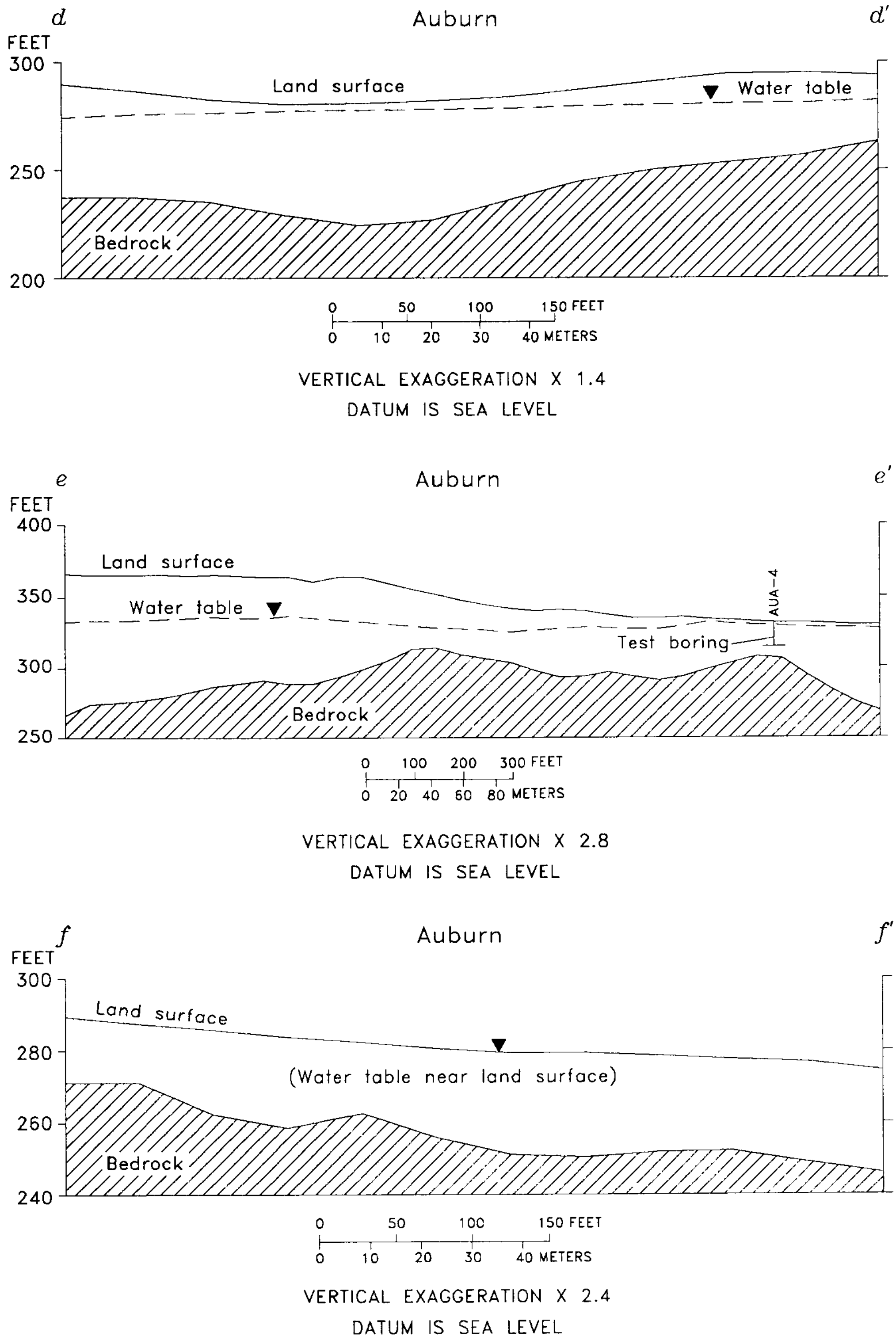
Local site number	Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
				Merrimack County--Continued
				Hooksett--Continued
	25	38	112SRFD	Sand, coarse to pebbly gravel; pred. coarse sand
	38	46	112SRFD	Sand, very fine to medium; pred. fine sand
	46	47	112TILL	Till
	47	--	112TILL	Refusal on till
HTW 20	0	30	112SRFD	Sand, very coarse
HTW 20	30	46	112SRFD	Sand, medium to very coarse; pred. coarse sand
	46	--	BEDROCK	Refusal on bedrock
HTW 23	0	28	112SRFD	Sand, coarse and gravel
	28	42	112SRFD	Sand, coarse, brown and gravel with trace clay
	42	49	112SRFD	Gravel, coarse, brown
	52	--	112SRFD	Refusal
HTW 265	0	21	112SRFD	Sand, fine to medium, brown; gravel
	21	42	112SRFD	Sand, medium to coarse, brown; gravel
	42	47	112SRFD	Sand, fine to medium, brown; gravel
	47	--	112SRFD	Refusal
				Rockingham County
				Auburn
AUA 1	0	10	112SRFD	Silt to fine sand
	10	17	112TILL	Till
	17	--	112TILL	EOH in till
AUA 2	0	17	112SRFD	Sand, medium to cobbles; pred. coarse sand
	17	29	112SRFD	Sand, medium to coarse; pebbles; pred. very coarse sand
	29	39	112SRFD	Silt to fine gravel; pred. silt
	39	47	112SRFD	Clay to silt and weathered rock
	47	--	BEDROCK	EOH in weathered rock
AUA 3	0	7	112SRFD	Sand, fine to medium; pred. medium sand
	7	12	112SRFD	Sand, medium to coarse; pred. medium sand
	12	17	112SRFD	Sand, coarse to very coarse
	17	19	112SRFD	Sand, fine to coarse; pred. fine to medium sand
	19	39	112SRFD	Silt to medium sand; pred. fine to medium sand
	39	42	112TILL	Till
	42	--	112TILL	EOH in till
AUA 4	0	15	112SRFD	Sand and gravel, cobbly
	15	--	BEDROCK	Refusal on bedrock

Local site number		Depth to top (ft)	Depth to bottom (ft)	Aquifer code	Lithologic description of material
					Rockingham County--Continued
					Auburn--Continued
AUB	1	0	19	112TILL	Till, sandy; refusal at 19 ft
AUB	4	0	6	110SDMN	Silt and fine sand
		6	13	110SDMN	Gravel, sandy; boulders
		13	--	BEDROCK	Bedrock; EOH at 25 ft
AUW	8	0	--	112TILL	Till, sandy
AUW	11	0	9	112OTSH	Sand and gravel
AUW	12	0	--	112OTSH	Sand
AUW	31	0	49	112SRFD	Sand, fine to medium; pred. fine sand
		49	75	112SRFD	Sand, very fine to medium; pred. fine to medium
		75	77	112TILL	Till
		77	--	112TILL	EOH in till
					Derry
DFW	12	0	--	112SRFD	Sand and gravel
					Londonderry
LRA	9	0	7.5	112SRFD	Sand, fine to medium, brown, trace silt
LRA	10	0	22.0	112SRFD	Sand, fine to medium, brown; trace silt
LRW	41	0	8	112SRFD	--
		8	--	BEDROCK	--
LRW	71	0	23	112SRFD	Sand, coarse
		23	28	112SRFD	Sand, fine
		28	33	112SRFD	Sand, fine
LRW	73	0	15.0	112SRFD	Sand, fine to medium, brown; trace silt
LRW	74	0	15.0	112SRFD	Sand, fine, brown; trace silt
LRW	75	0	20.2	112TILL	Till, sandy
		20.2	30.2	BEDROCK	--
LRW	76	0	9.0	112SRFD	Sand, fine, brown; trace silt
		9.0	12.0	112LCSR	Silt, gray to brown; trace sand
		12.0	30.0	112SRFD	Sand, fine to medium; trace silt
LRW	77	0	2.0	111SOIL	--
		2.0	16.0	112SRFD	Sand, fine to medium; trace silt
		16.0	25.0	112TILL	Till, sandy
LRW	78	0	20.0	112SRFD	Sand, fine, brown; trace silt
		20.0	25.0	112SRFD	Sand, fine to coarse, brown; trace silt
		25.0	49.0	112SRFD	Sand, fine; trace silt
		49.0	52.5	112TILL	Till, sandy

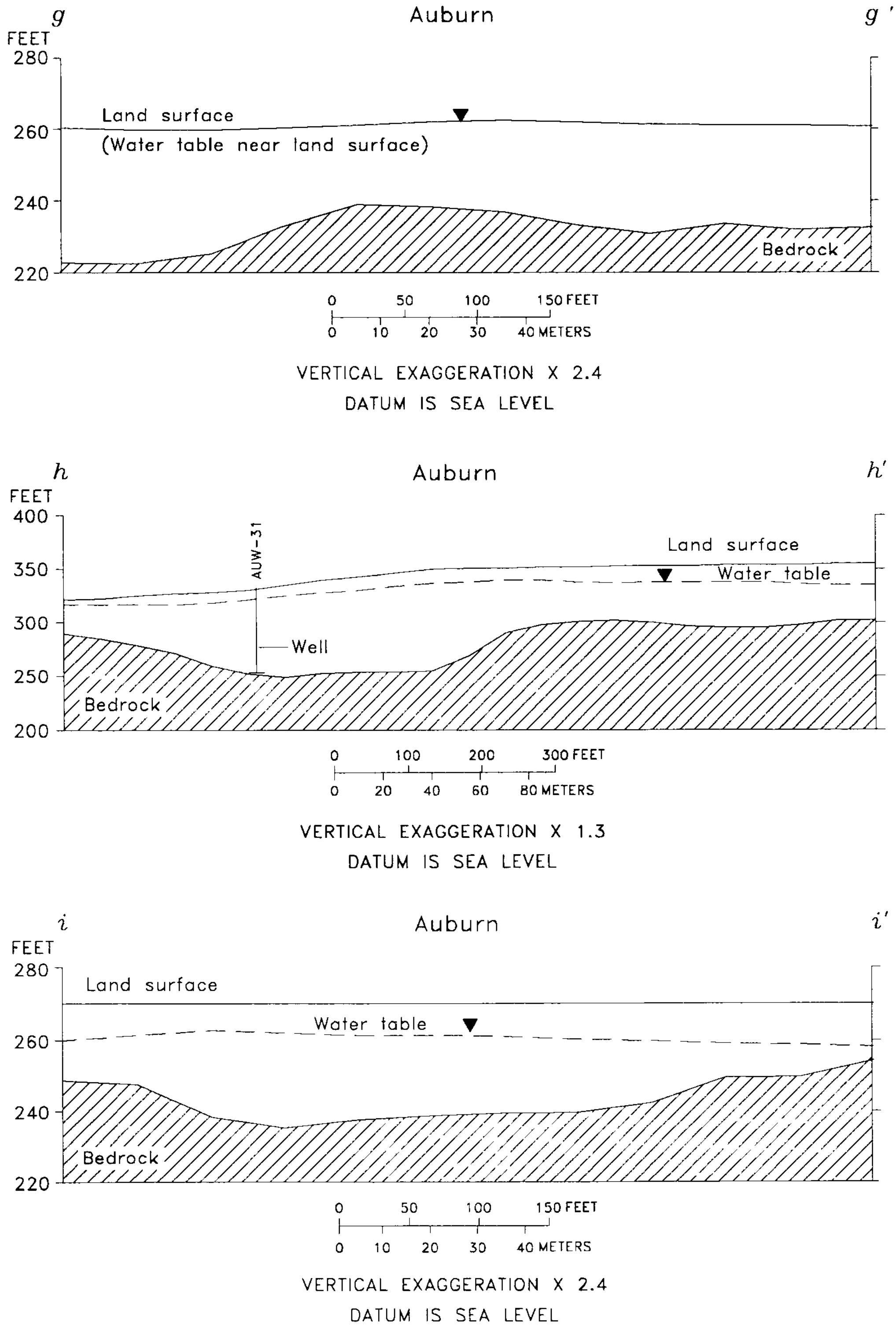
APPENDIX C



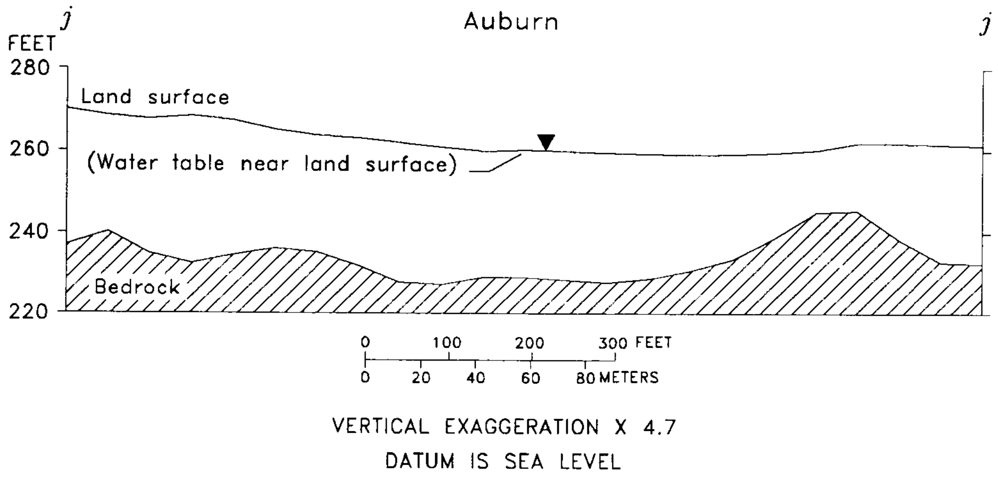
Appendix C1. Geohydrologic sections interpreted from seismic-refraction data for Auburn lines a-a′, b-b′, and c-c′ (locations shown on plate 4).

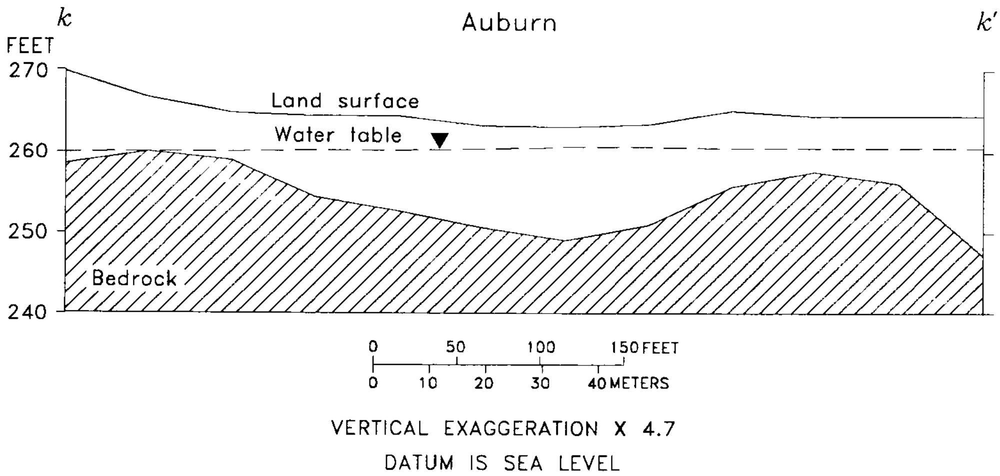


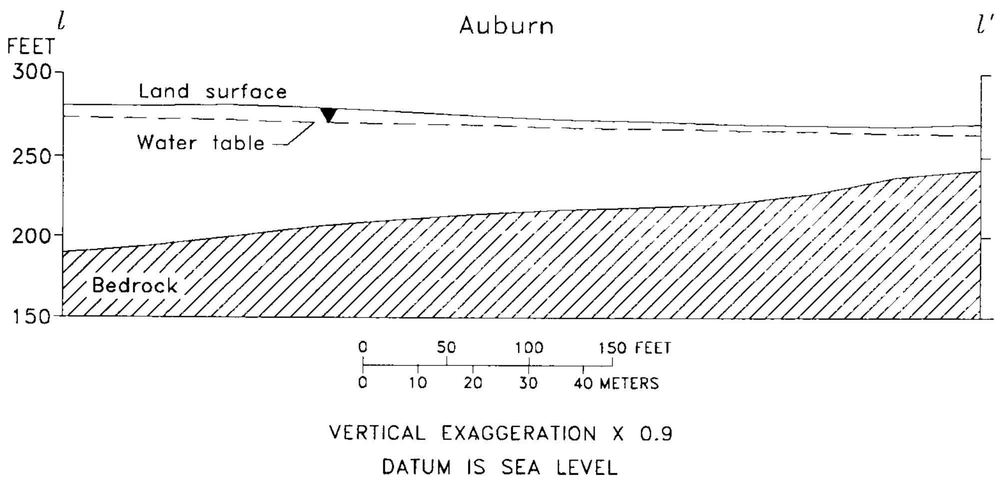
Appendix C2. Geohydrologic sections interpreted from seismic-refraction data for Auburn lines d-d′, e-e′, and f-f′ (locations shown on plate 4).



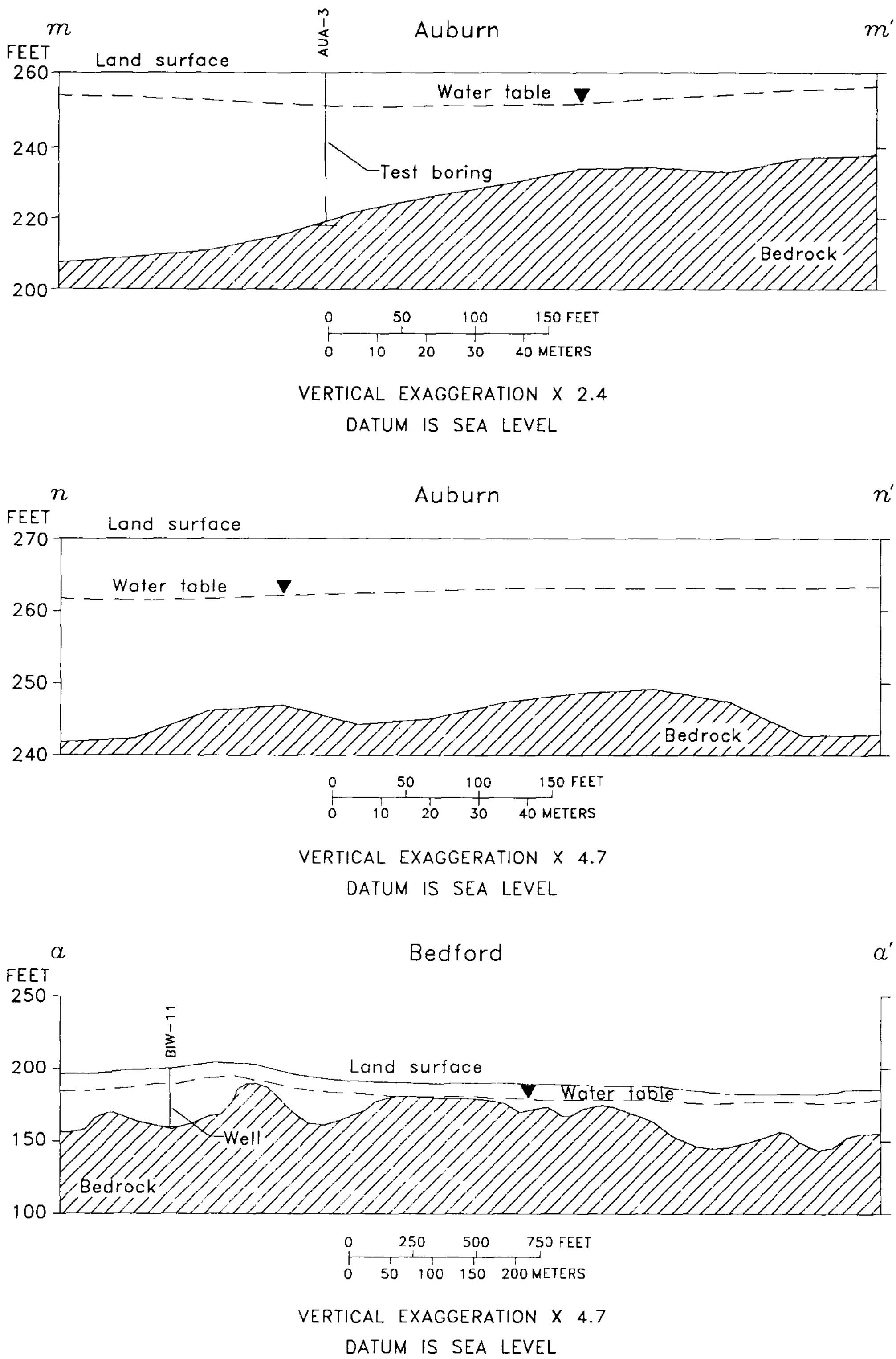
Appendix C3. Geohydrologic sections interpreted from seismic-refraction data for Auburn lines g-g´, h-h´, and i-i´ (locations shown on plate 4).



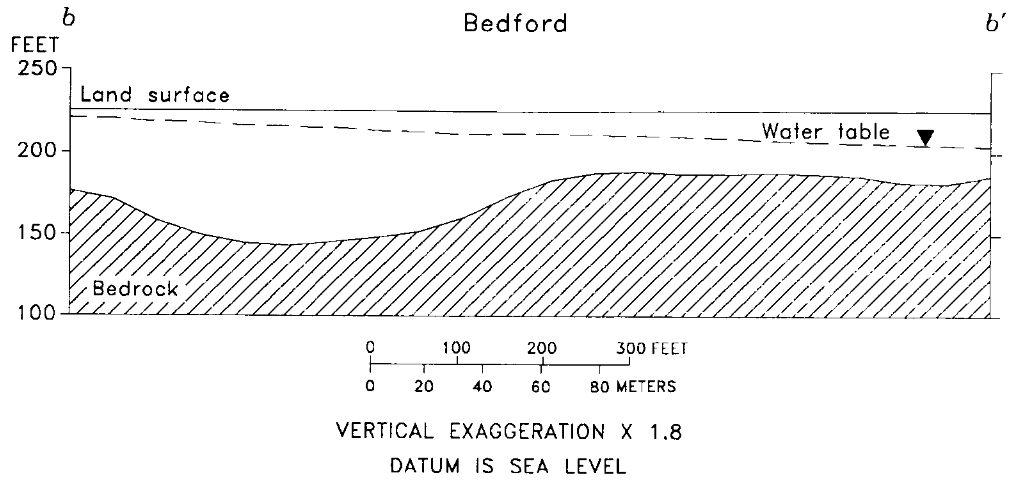


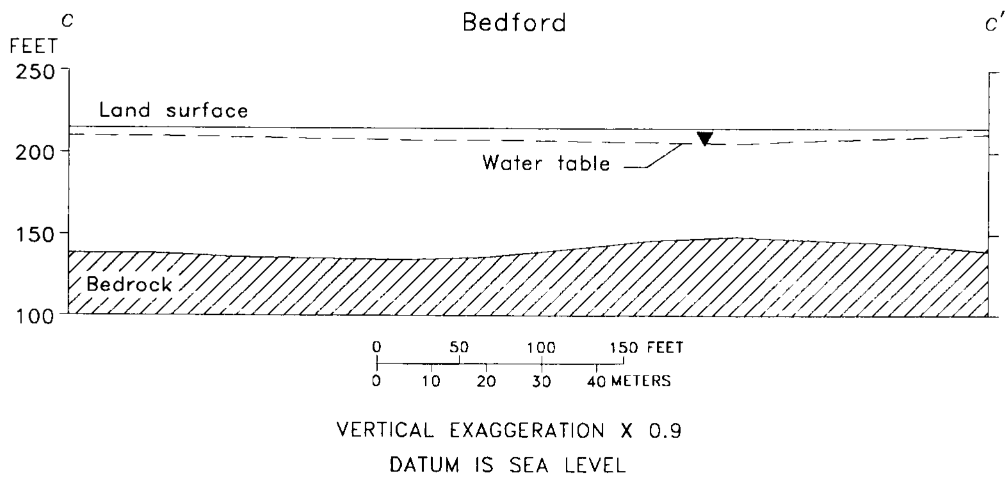


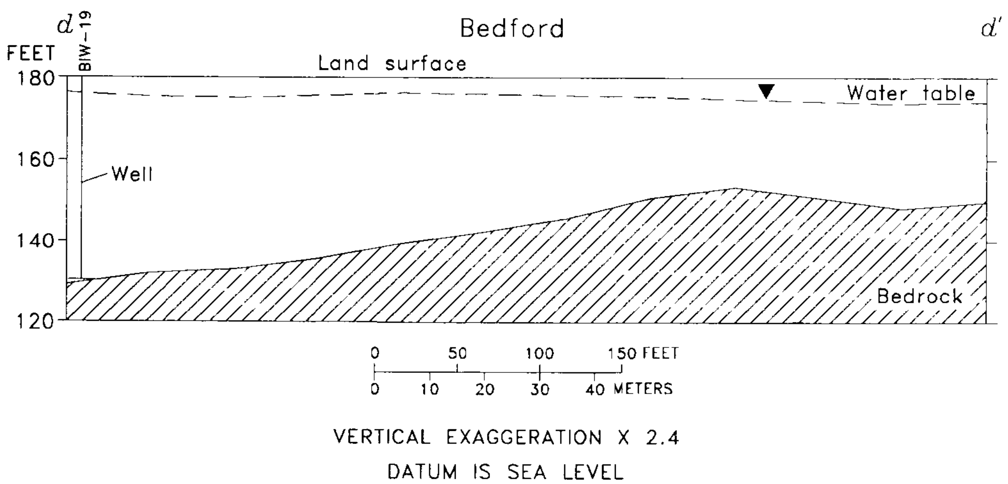
Appendix C4. Geohydrologic sections interpreted from seismic-refraction data for Auburn lines j-j´, k-k´, and l-l´ (locations shown on plate 4).



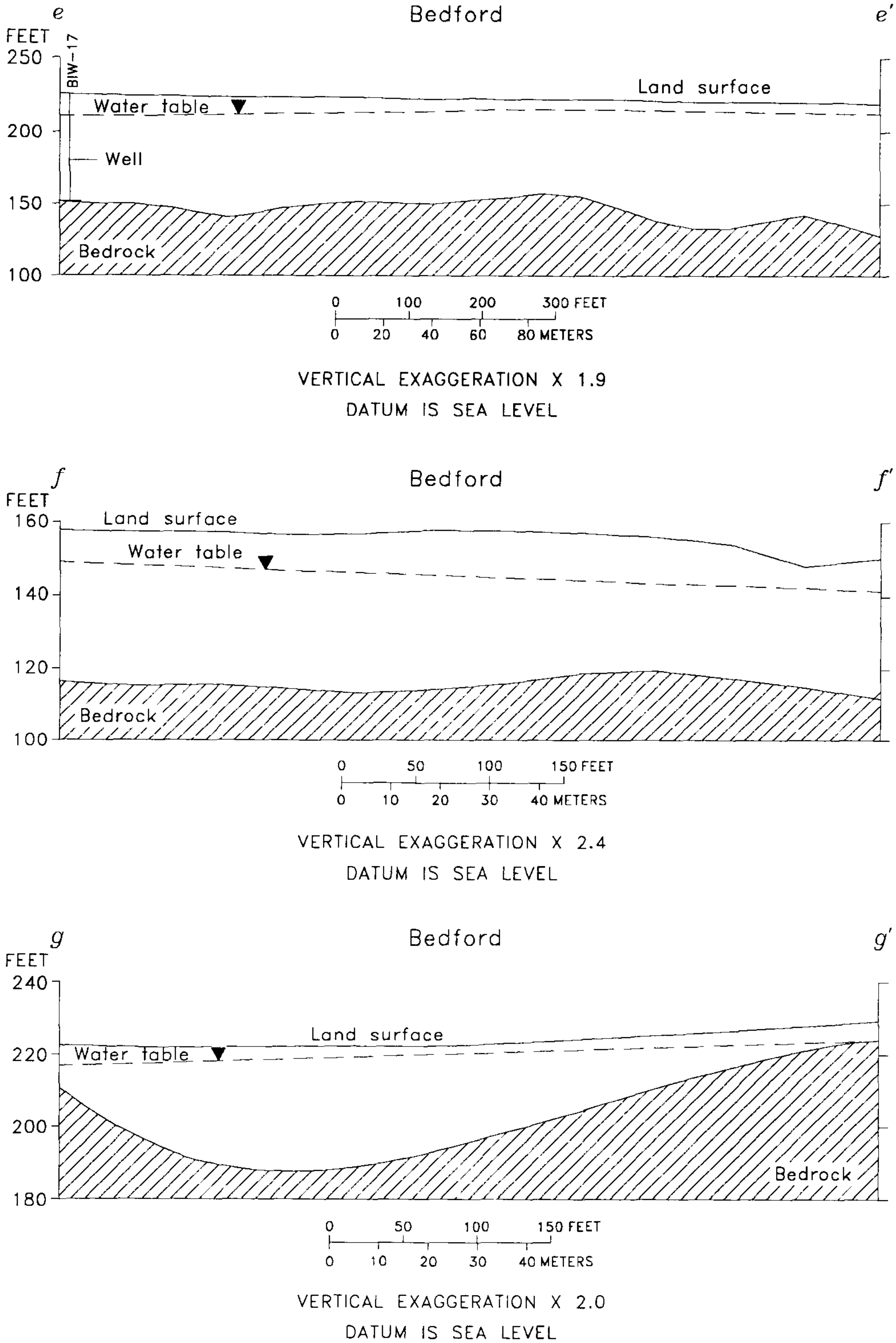
Appendix C5. Geohydrologic sections interpreted from seismic-refraction data for Auburn lines m-m′ and n-n′ and Bedford line a-a′ (locations shown on plate 4).



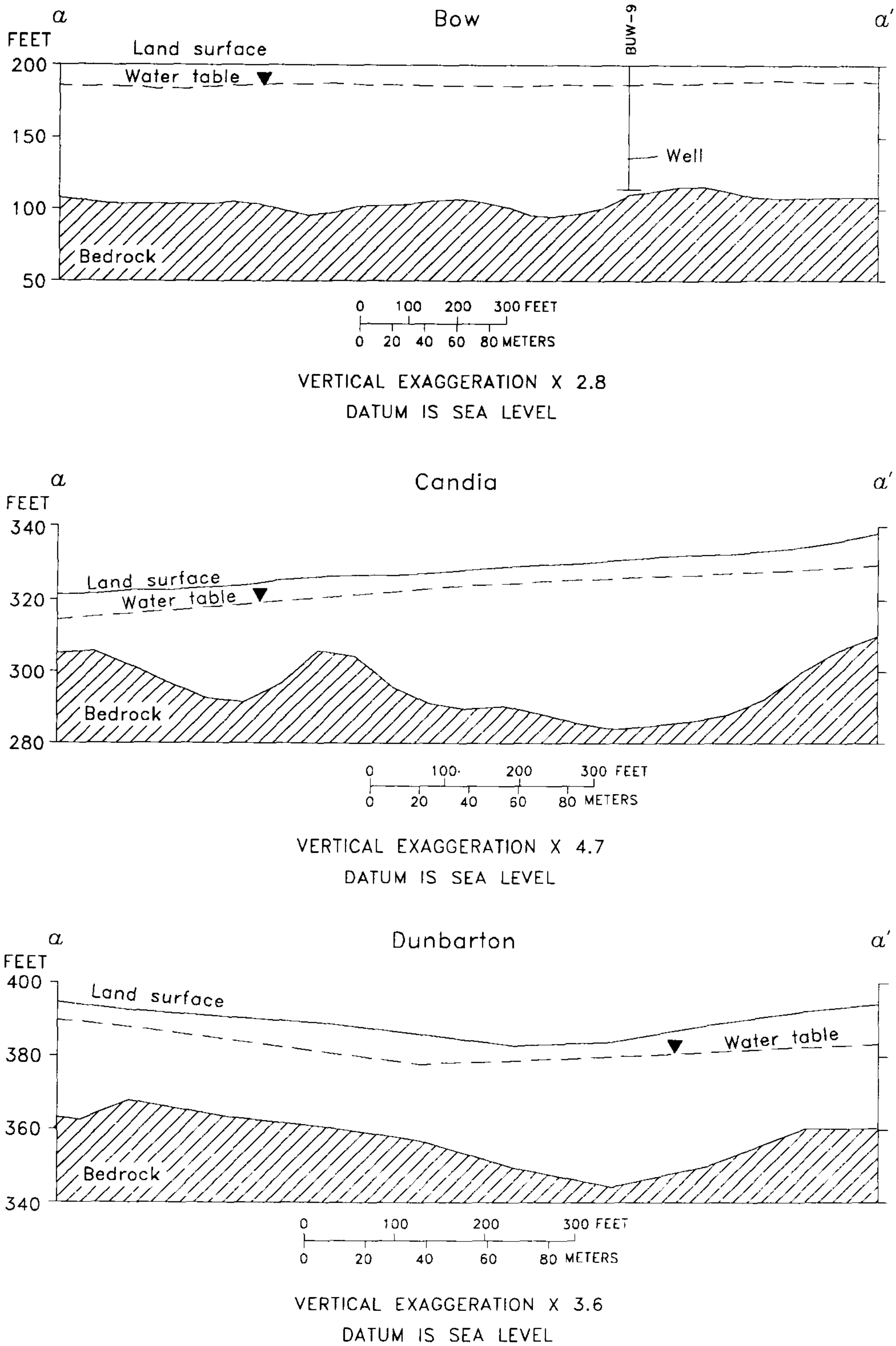




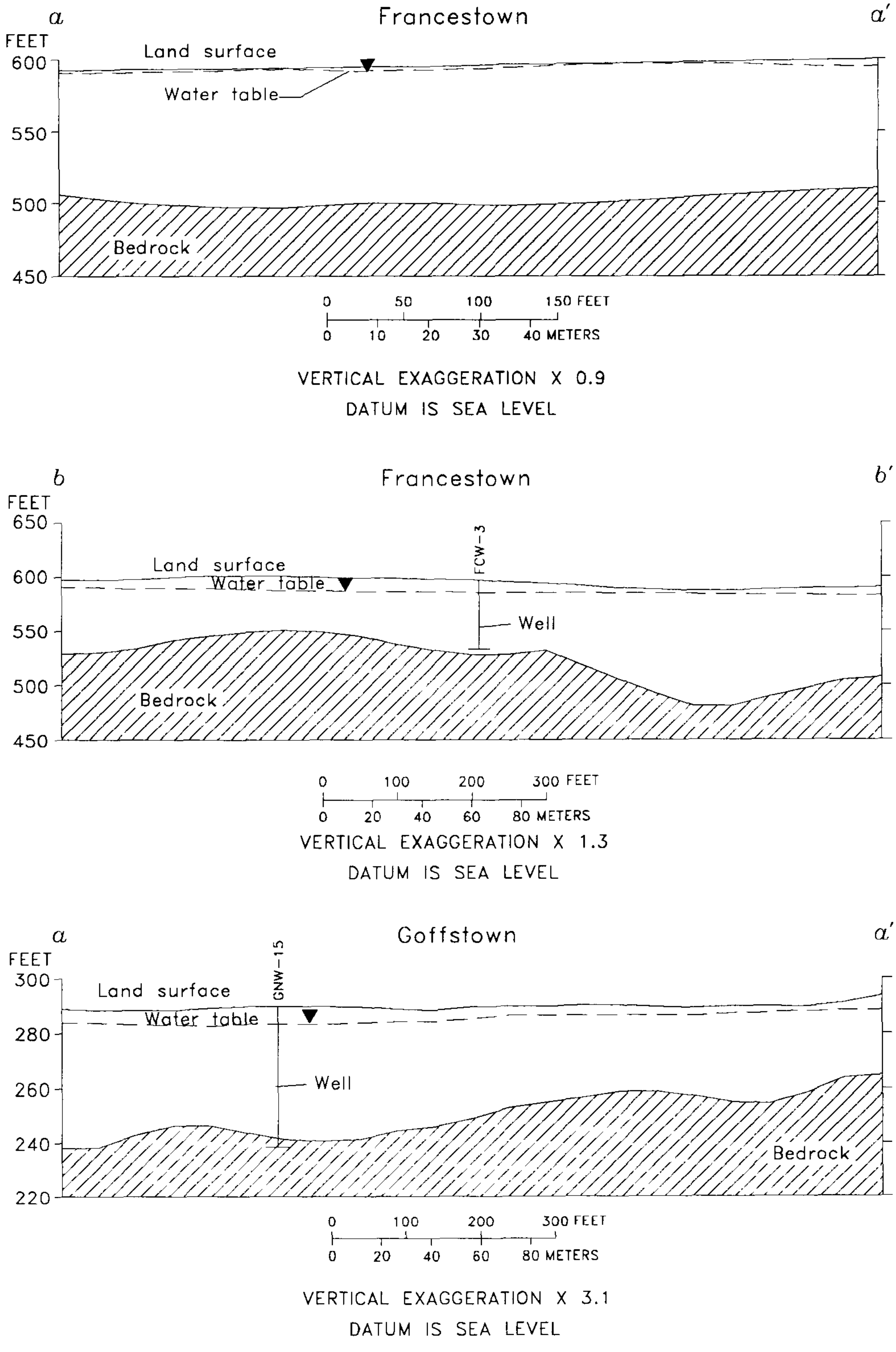
Appendix C6. Geohydrologic sections interpreted from seismic-refraction data for Bedford line b-b′ (location shown on plate 3) and Bedford lines c-c′, and d-d′ (locations shown on plate 4).



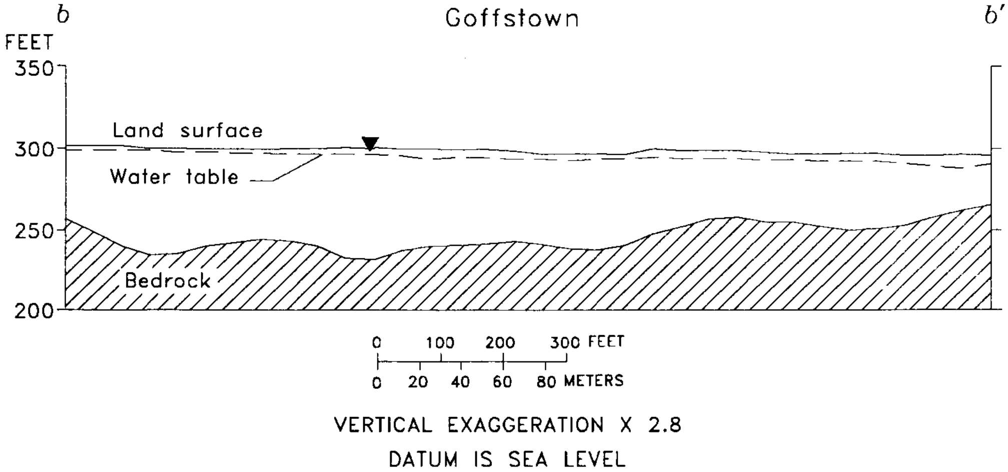
Appendix C7. Geohydrologic sections interpreted from seismic-refraction data for Bedford lines e-e´ and f-f´ (locations shown on plate 4) and Bedford line g-g´ (location shown on plate 3).

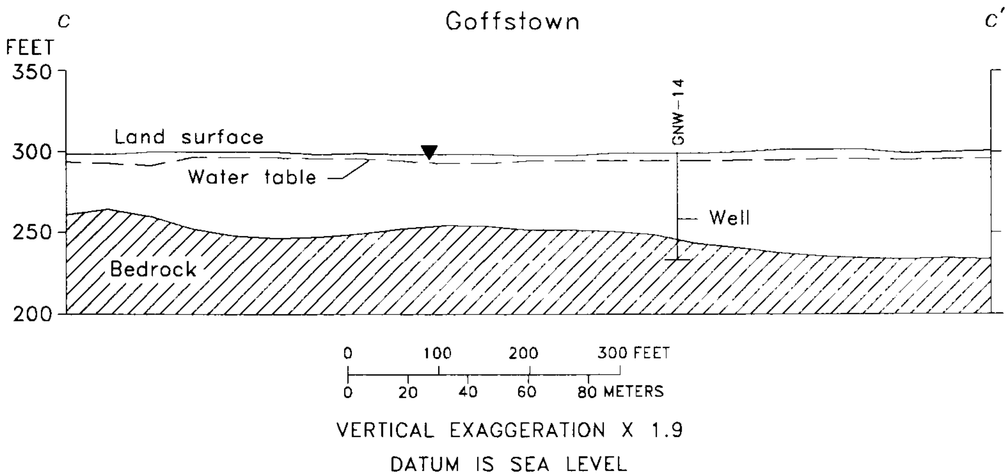


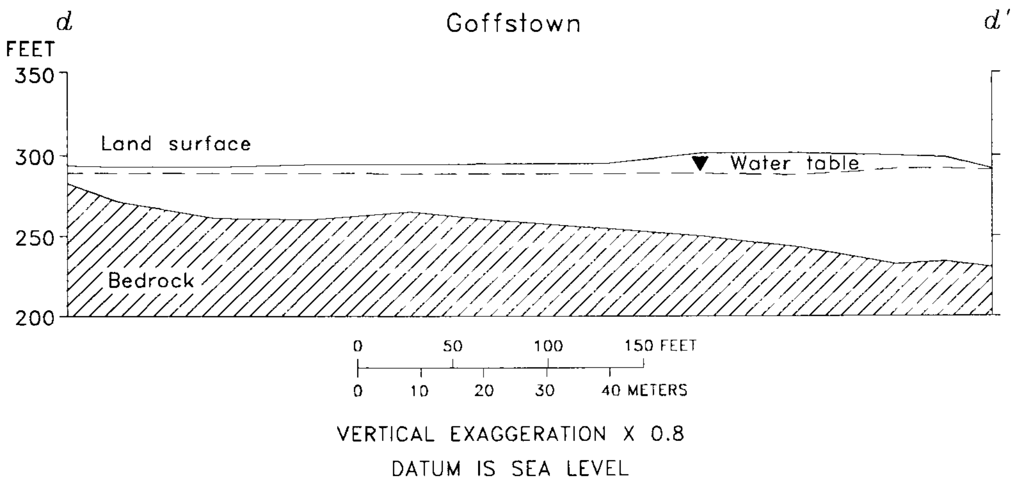
Appendix C8. Geohydrologic sections interpreted from seismic-refraction data for Bow line a-a′ and Candia line a-a′ (locations shown on plate 4) and Dunbarton line a-a′ (location shown on plate 3).



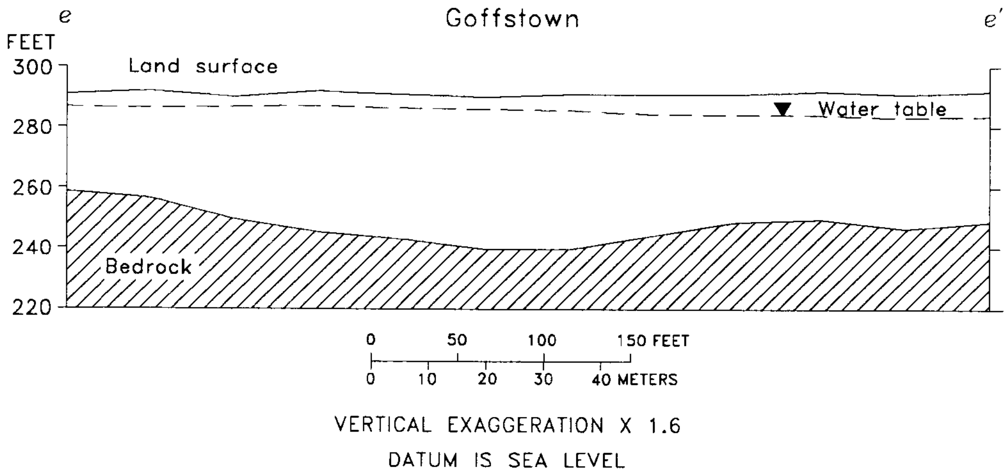
Appendix C9. Geohydrologic sections interpreted from seismic-refraction data for Francetown lines a-a′ and b-b′ (locations shown on plate 2) and Goffstown line a-a′ (location shown on plate 3).

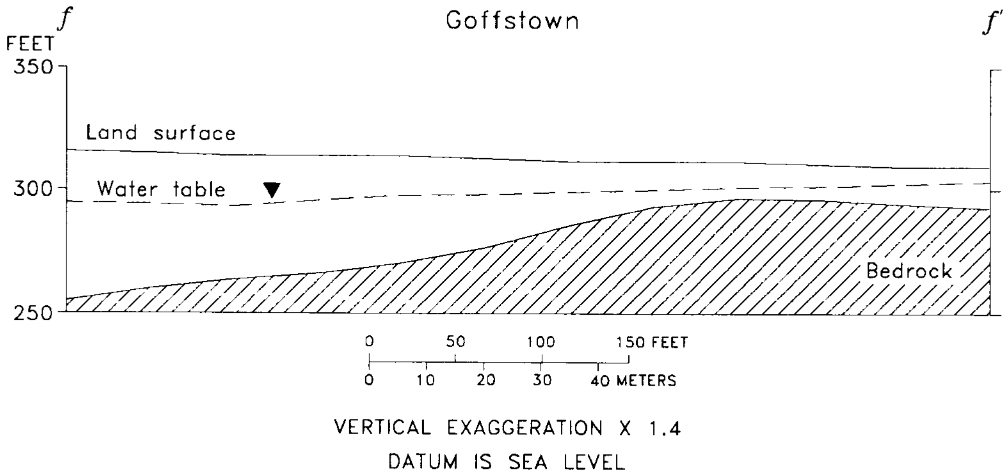


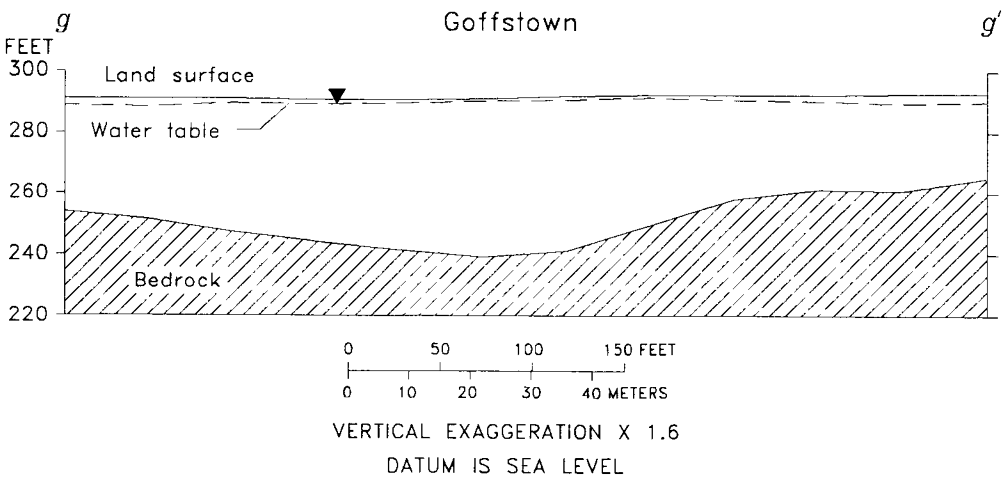




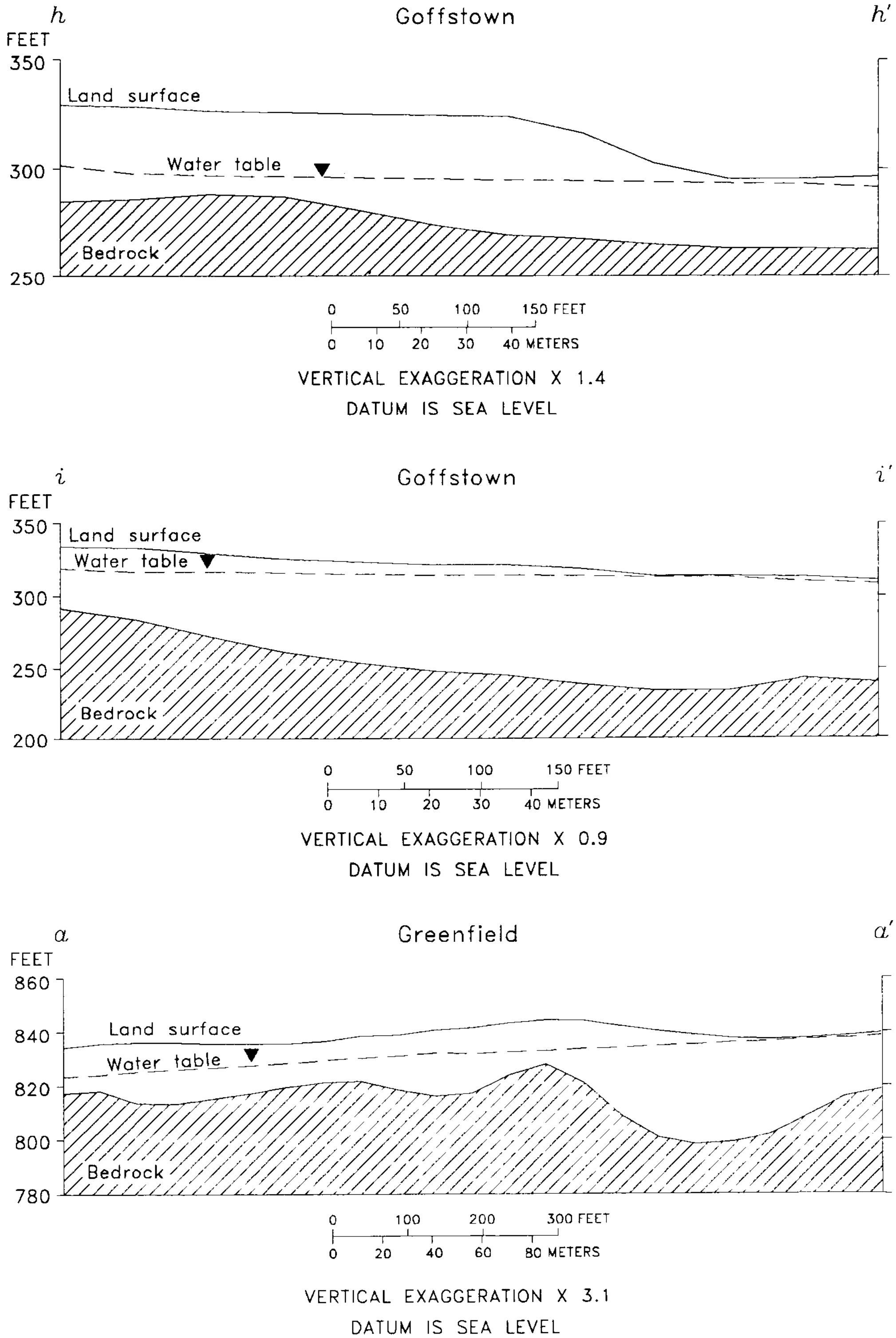
Appendix C10. Geohydrologic sections interpreted from seismic-refraction data for Goffstown lines b-b´, c-c´, and d-d´ (locations shown on plate 3).



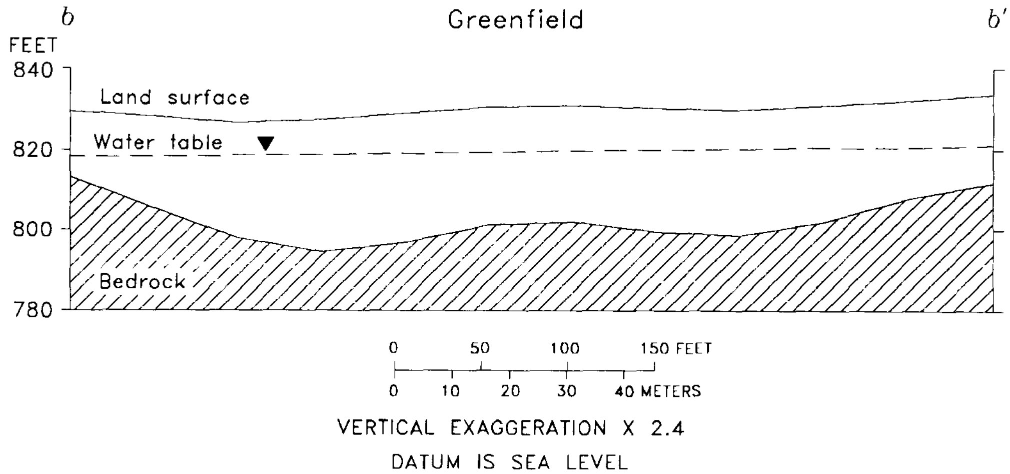


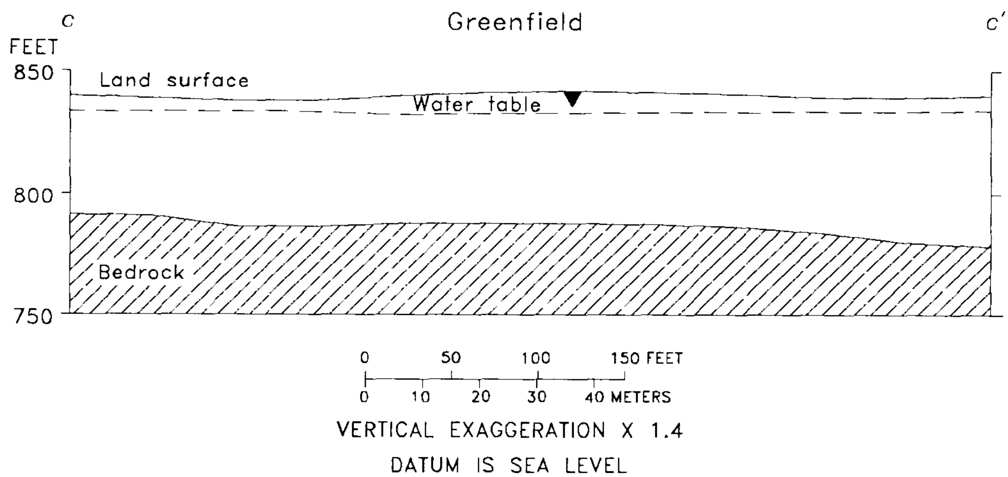


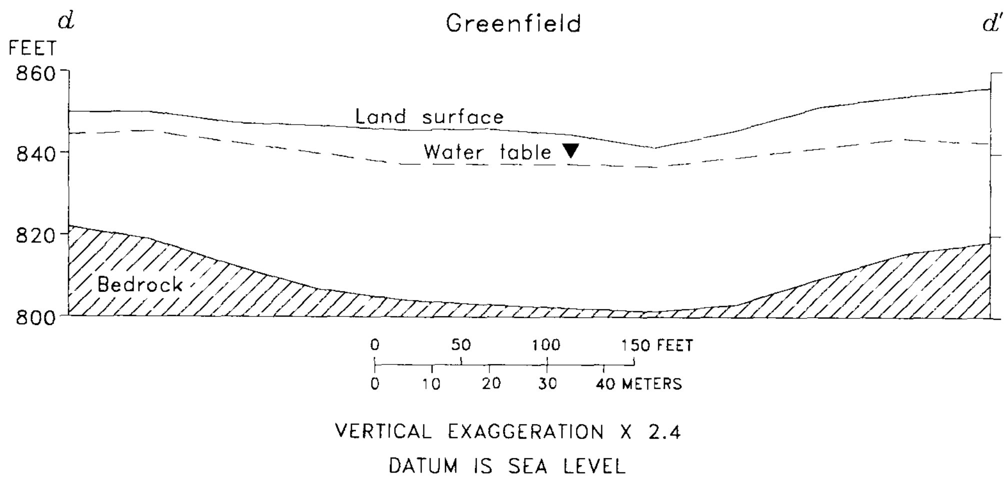
Appendix C11. Geohydrologic sections interpreted from seismic-refraction data for Goffstown lines e-e′, f-f′, and g-g′ (locations shown on plate 3).



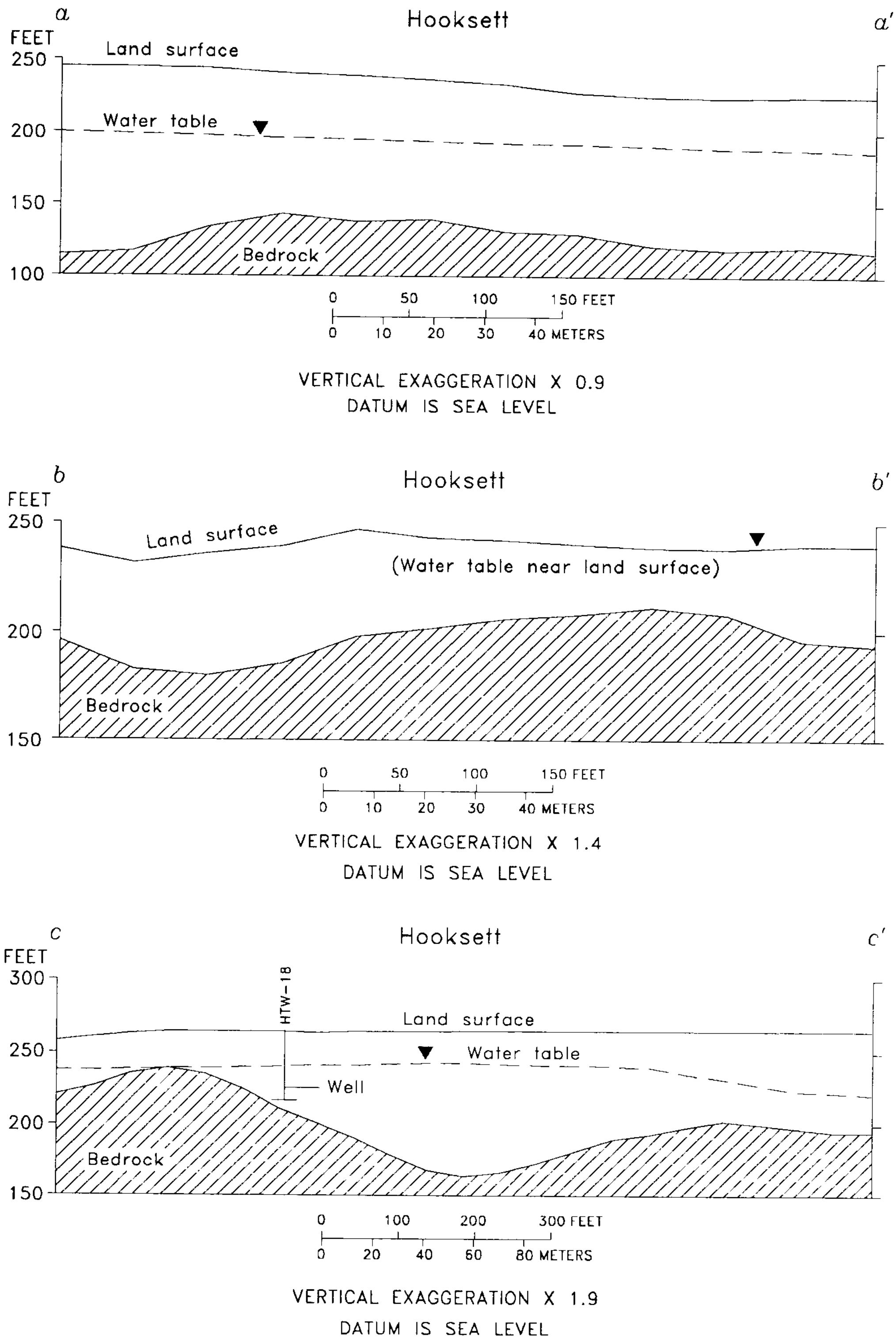
Appendix C12. Geohydrologic sections interpreted from seismic-refraction data for Goffstown lines h-h′ and i-i′ (locations shown on plate 3) and Greenfield line a-a′ (location shown on plate 2).



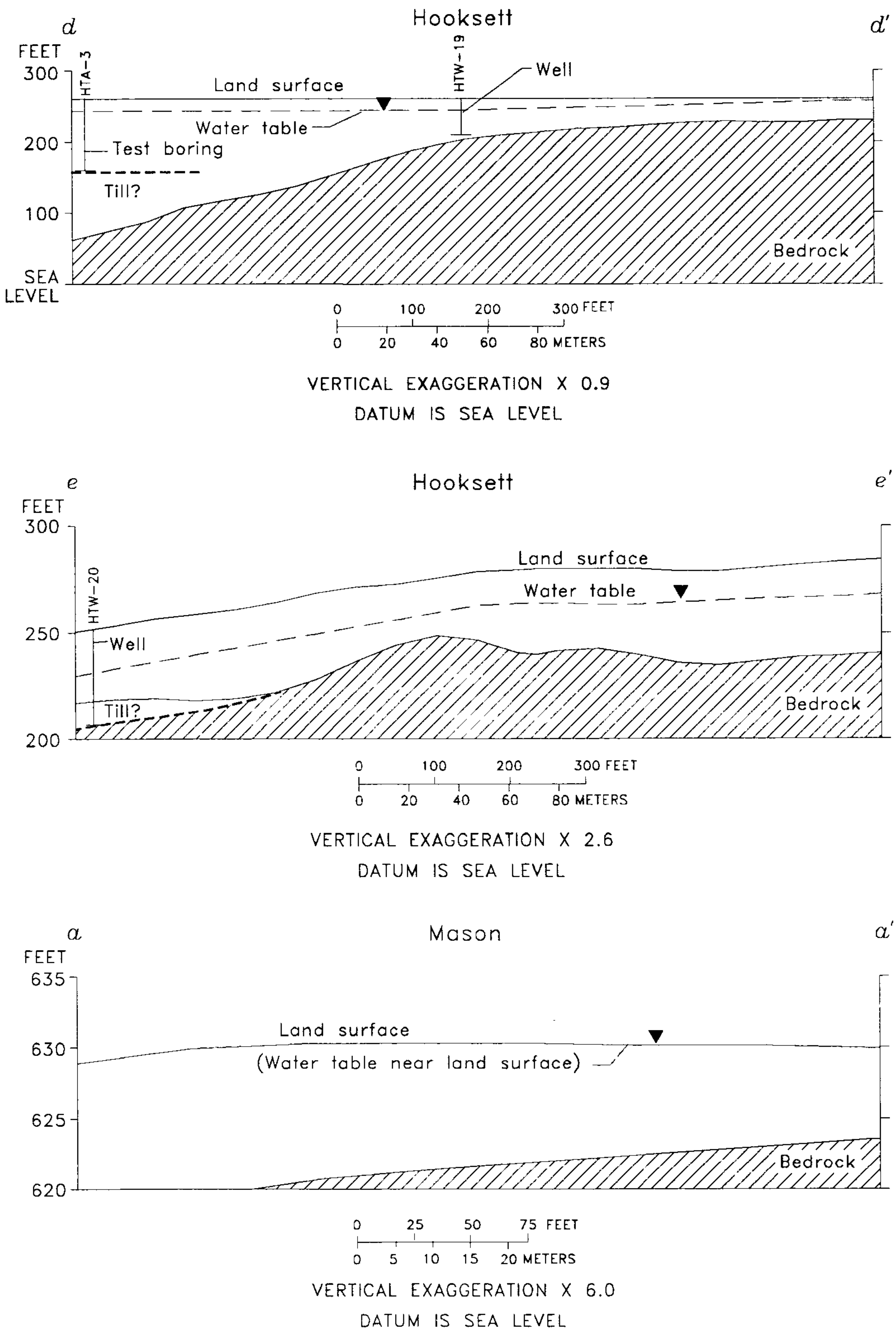




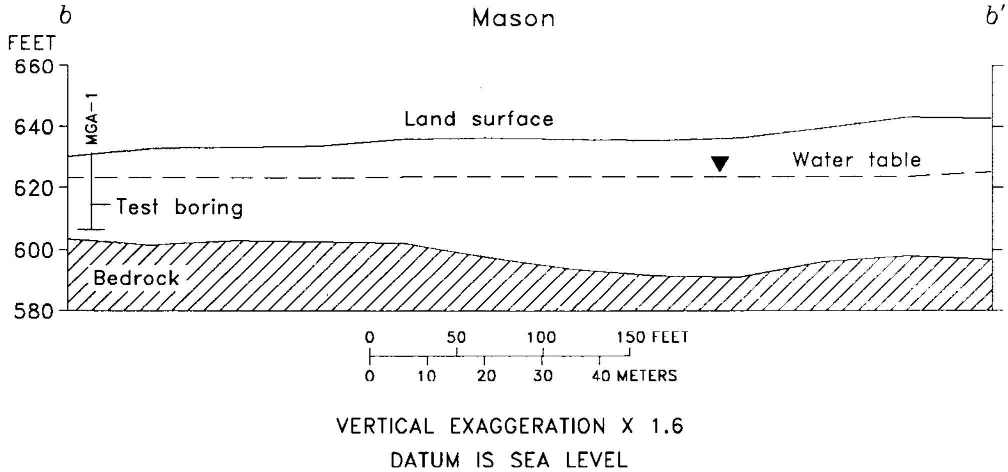
Appendix C13. Geohydrologic sections interpreted from seismic-refraction data for Greenfield lines b-b´, c-c´, and d-d´ (locations shown on plate 2).

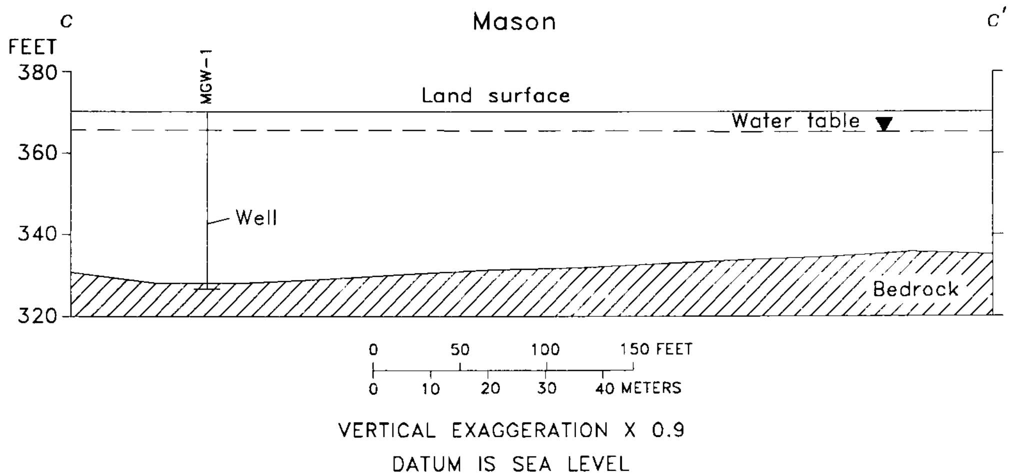


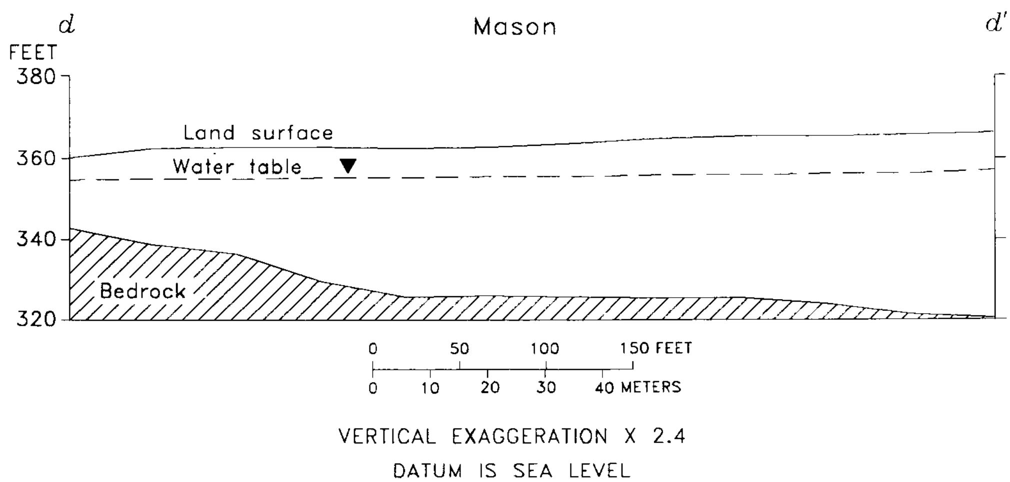
Appendix C14. Geohydrologic sections interpreted from seismic-refraction data for Hooksett lines a-a′, b-b′, and c-c′ (locations shown on plate 4).



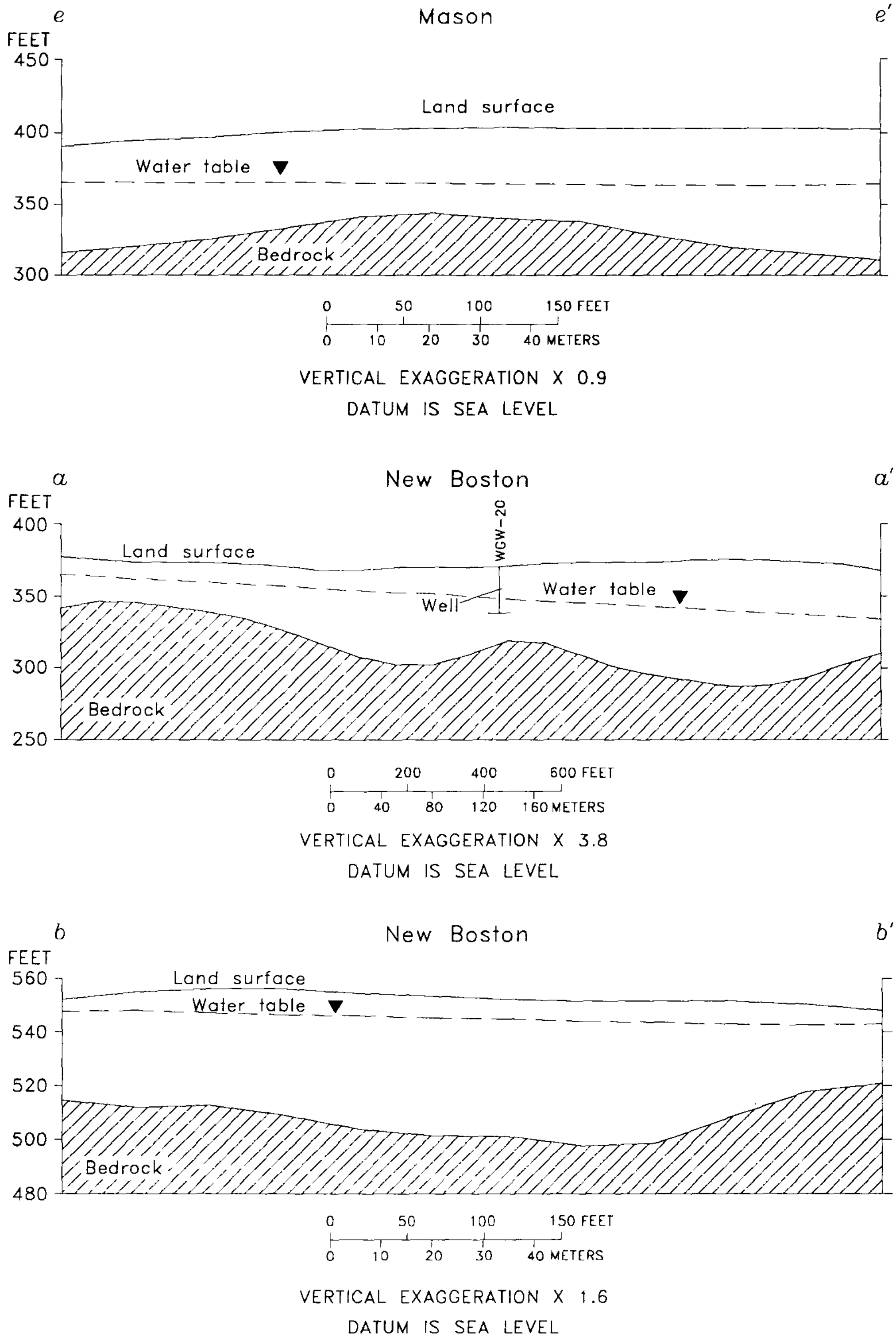
Appendix C15. Geohydrologic sections interpreted from seismic-refraction data for Hooksett lines d-d′ and e-e′ (locations shown on plate 4) and Mason line a-a′ (location shown on plate 1).



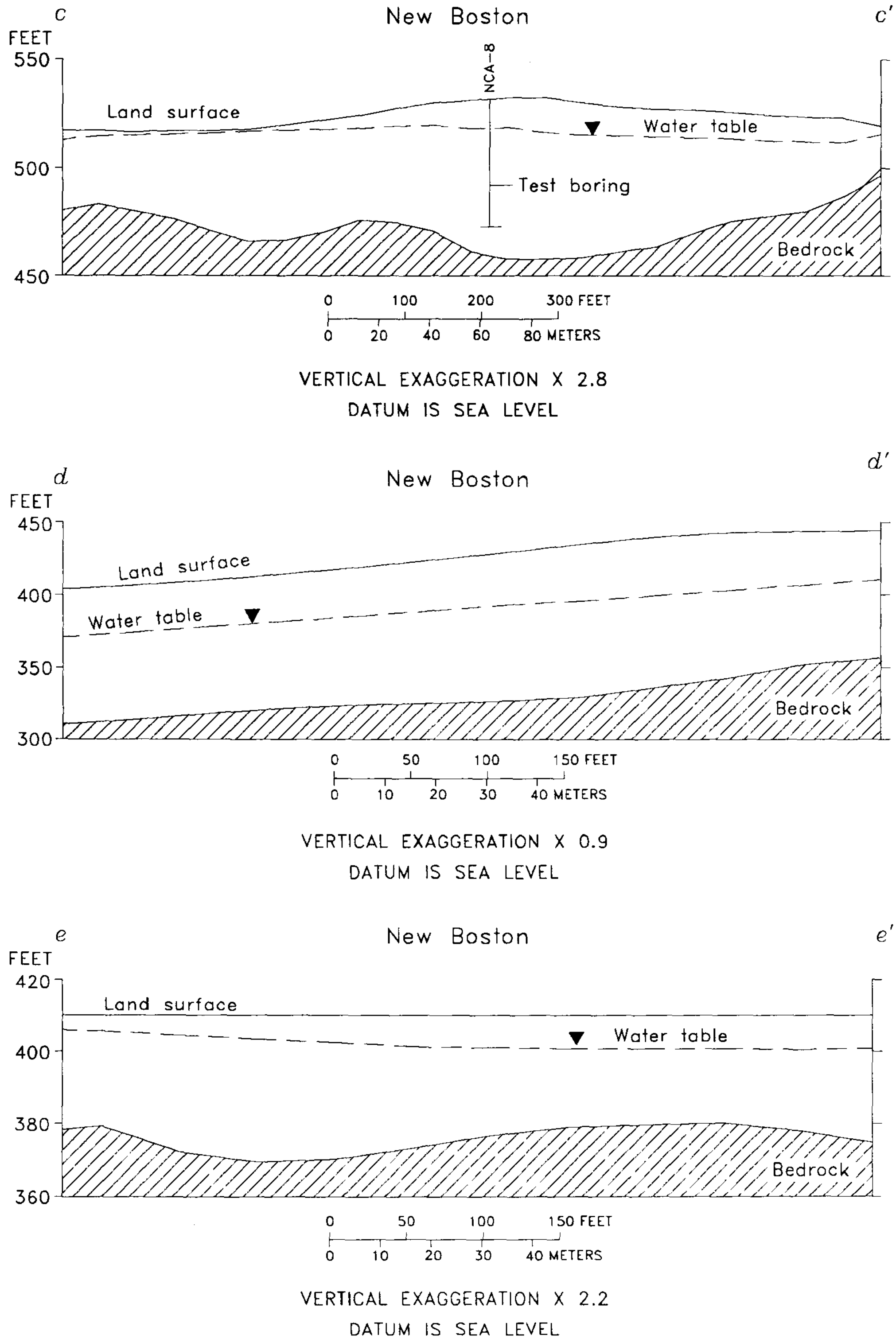




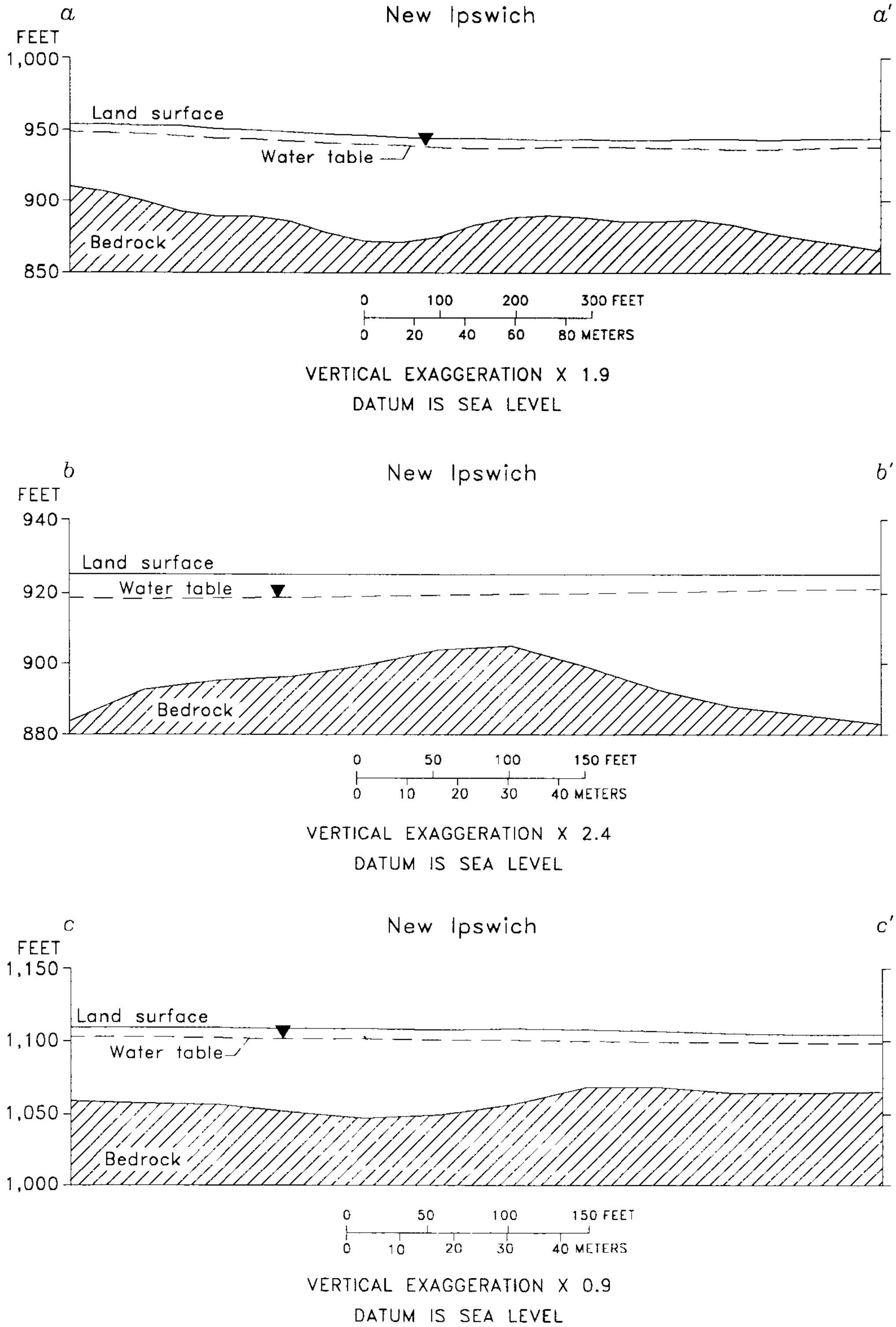
Appendix C16. Geohydrologic sections interpreted from seismic-refraction data for Mason lines b-b′, c-c′, and d-d′ (locations shown on plate 1).



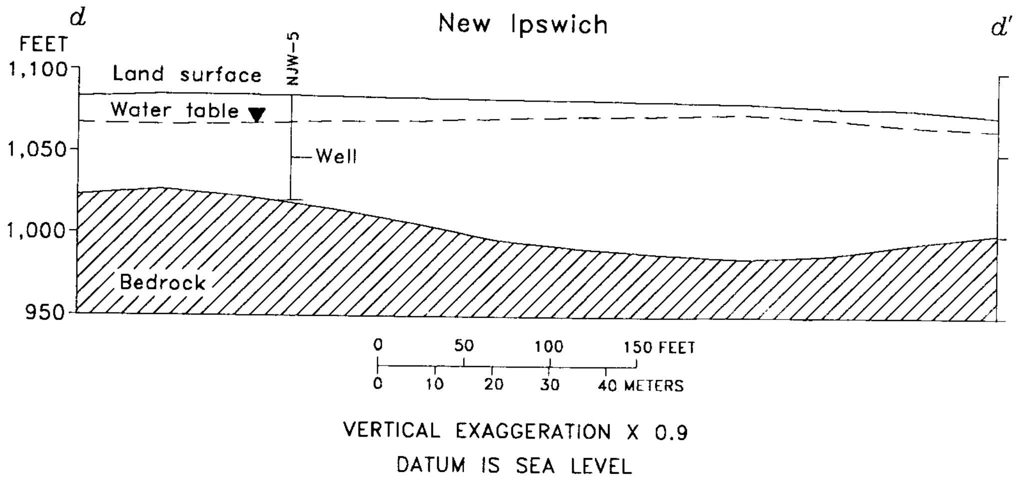
Appendix C17. Geohydrologic sections interpreted from seismic-refraction data for Mason line e-e´ (location shown on plate 1) and New Boston lines a-a´ and b-b´ (locations shown on plates 3 and 2, respectively).

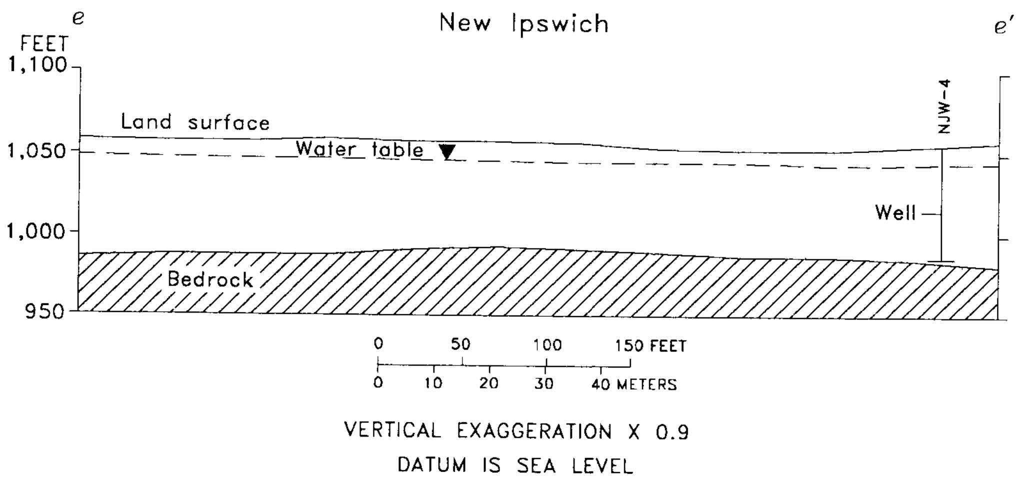


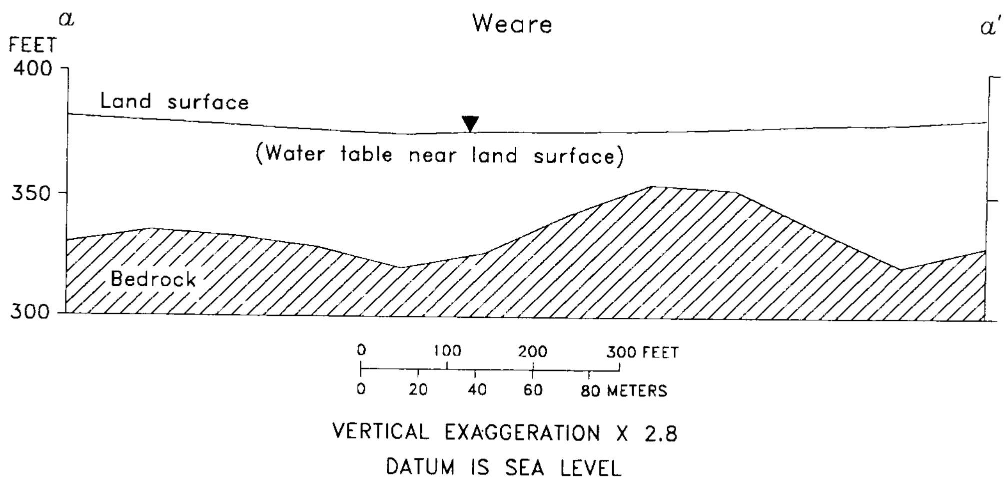
Appendix C18. Geohydrologic sections interpreted from seismic-refraction data for New Boston lines c-c′ (location shown on plate 2), d-d′ and e-e′ (locations shown on plate 3).



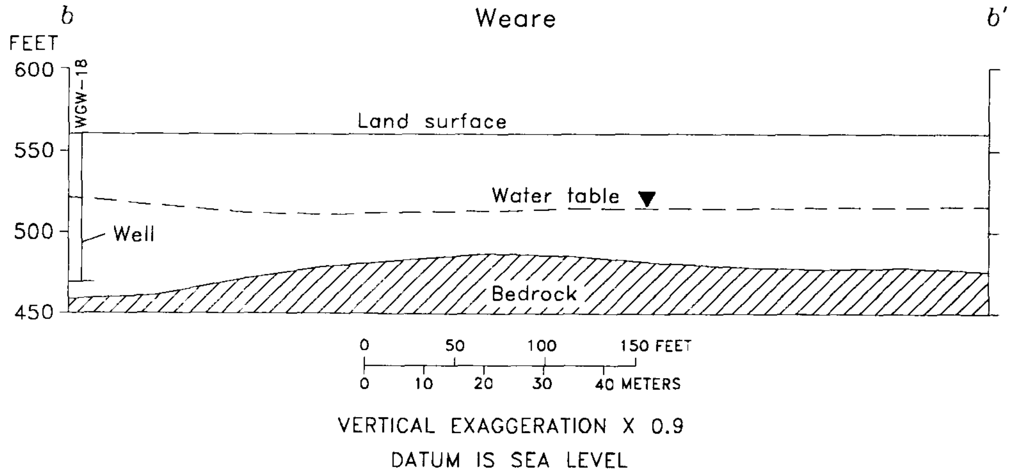
Appendix C19. Geohydrologic sections interpreted from seismic-refraction data for New Ipswich lines a-a′, b-b′, and c-c′ (locations shown on plate 1).

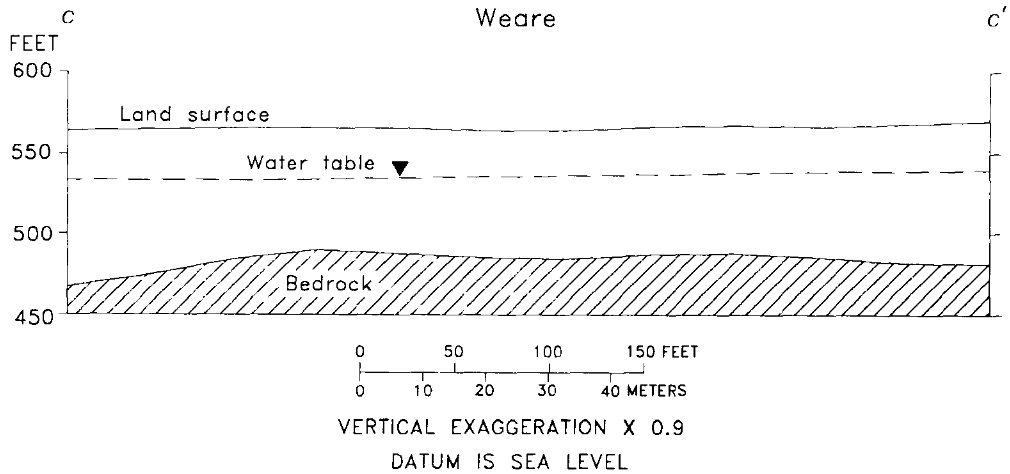


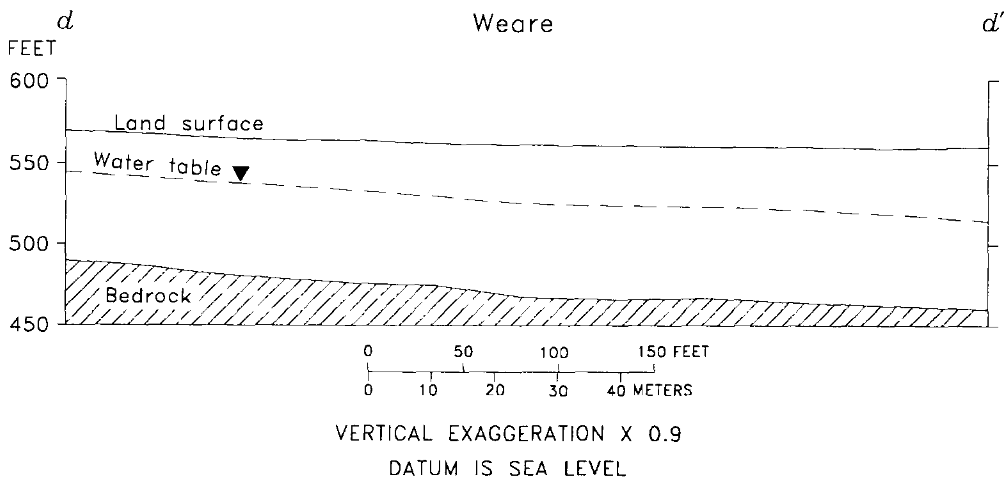




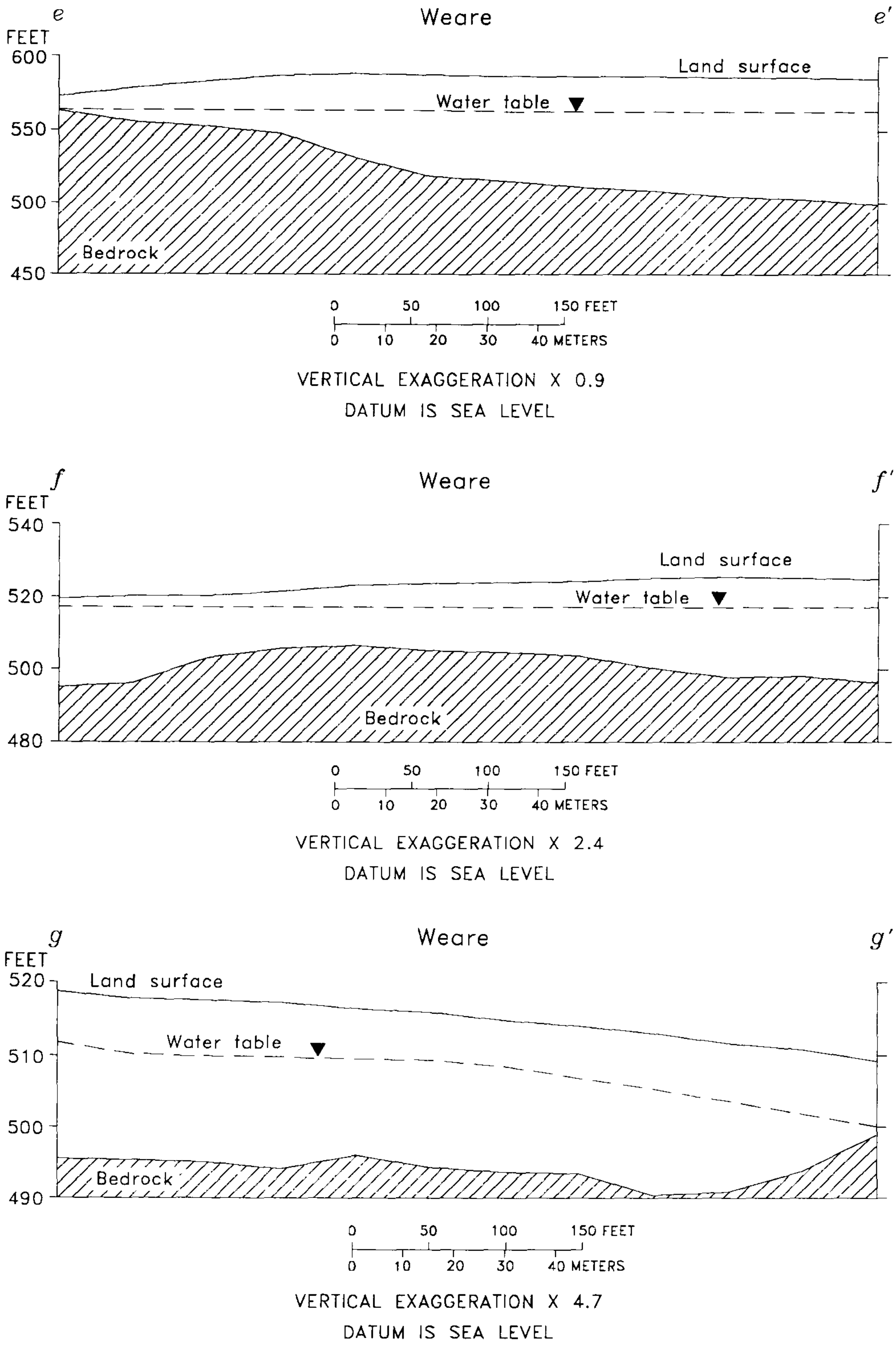
Appendix C20. Geohydrologic sections interpreted from seismic-refraction data for New Ipswich lines d-d′ and e-e′ (locations shown on plate 1) and Weare line a-a′ (location shown on plate 3).



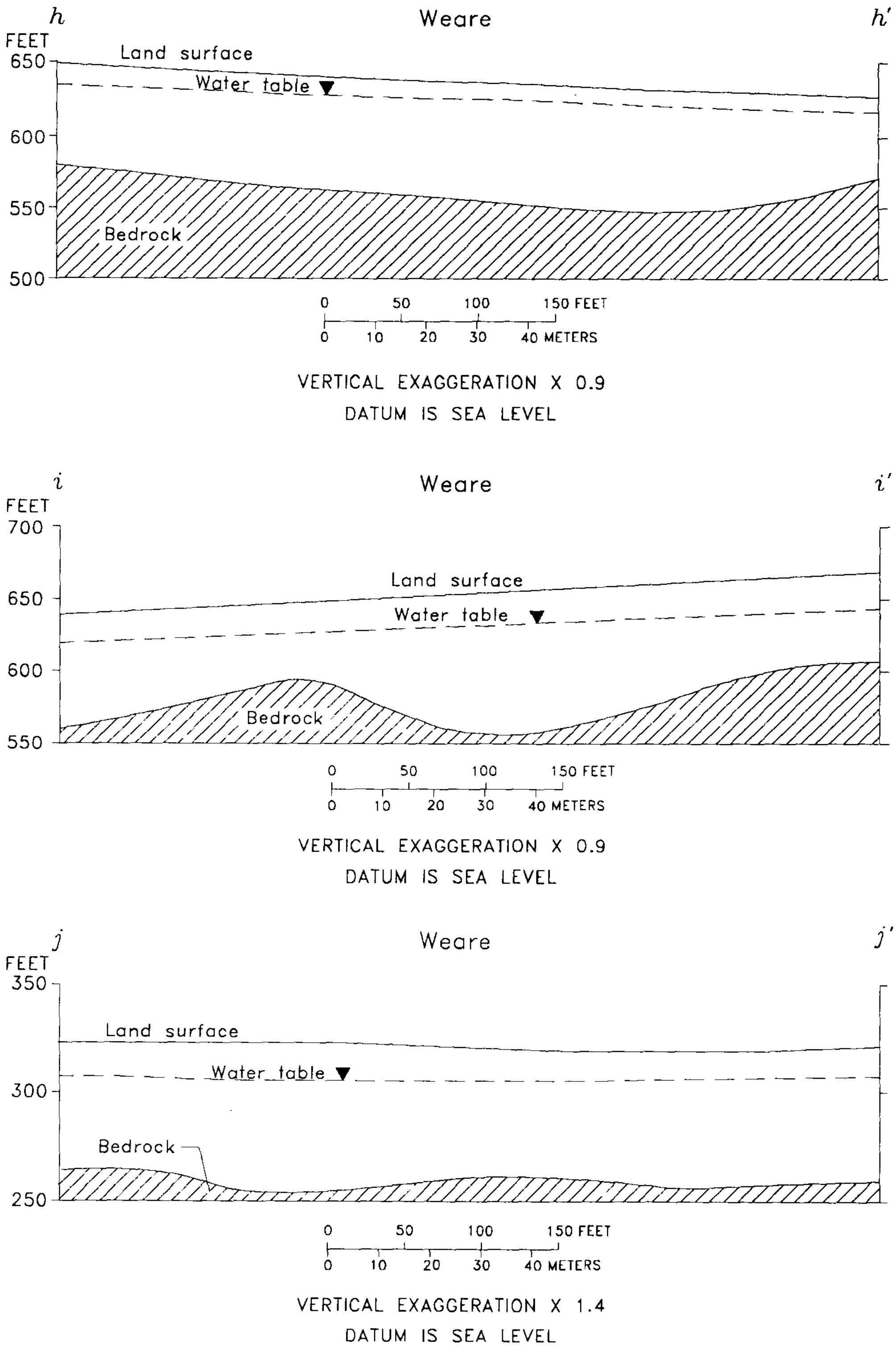




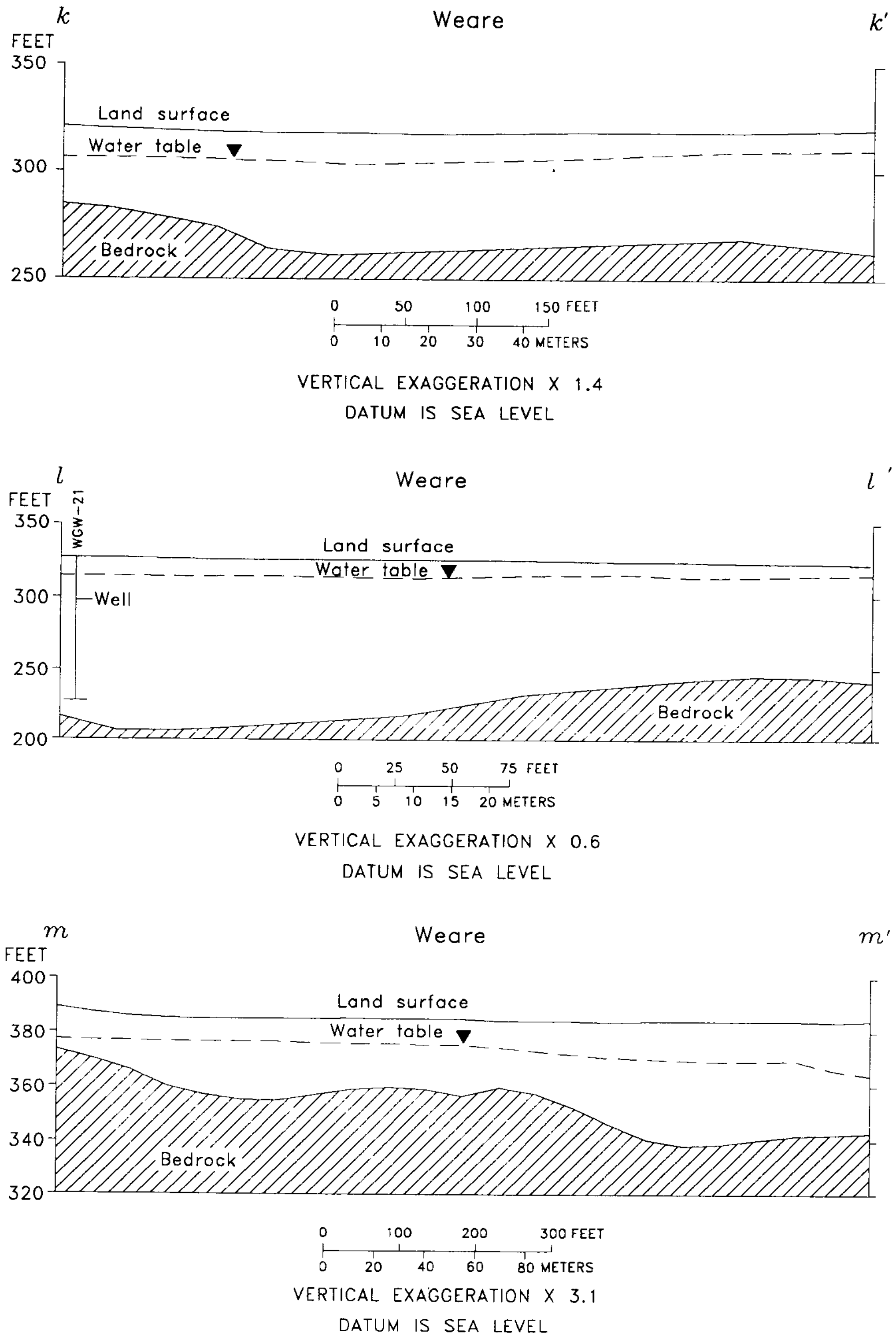
Appendix C21. Geohydrologic sections interpreted from seismic-refraction data for Weare lines b-b´, c-c´, and d-d´ (locations shown on plate 2).



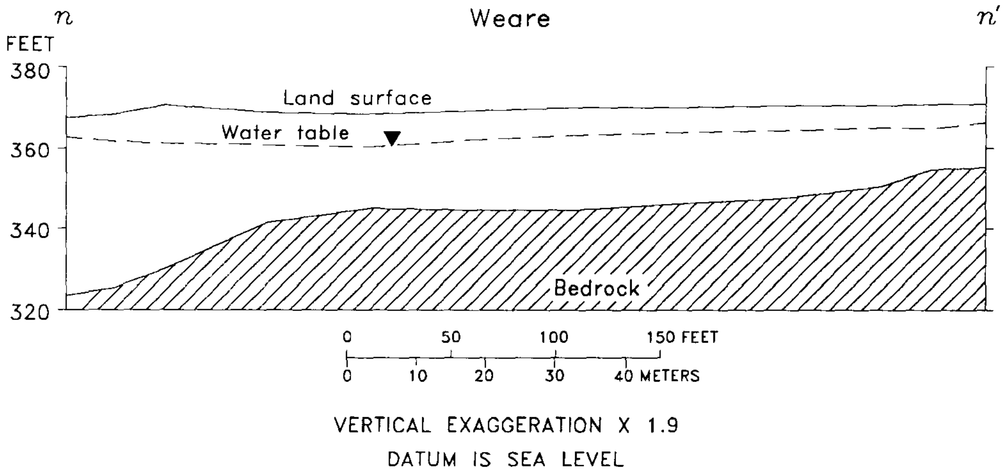
Appendix C22. Geohydrologic sections interpreted from seismic-refraction data for Weare lines e-e′, f-f′, and g-g′ (locations shown on plate 2).

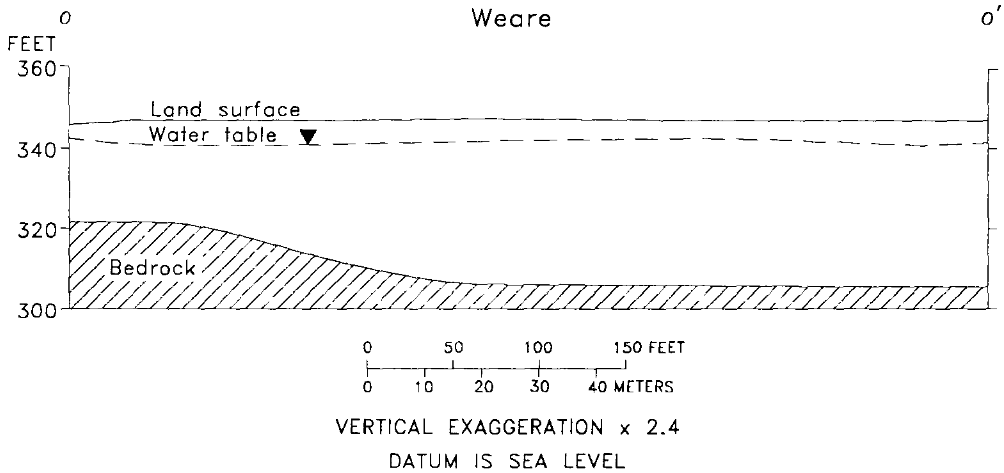


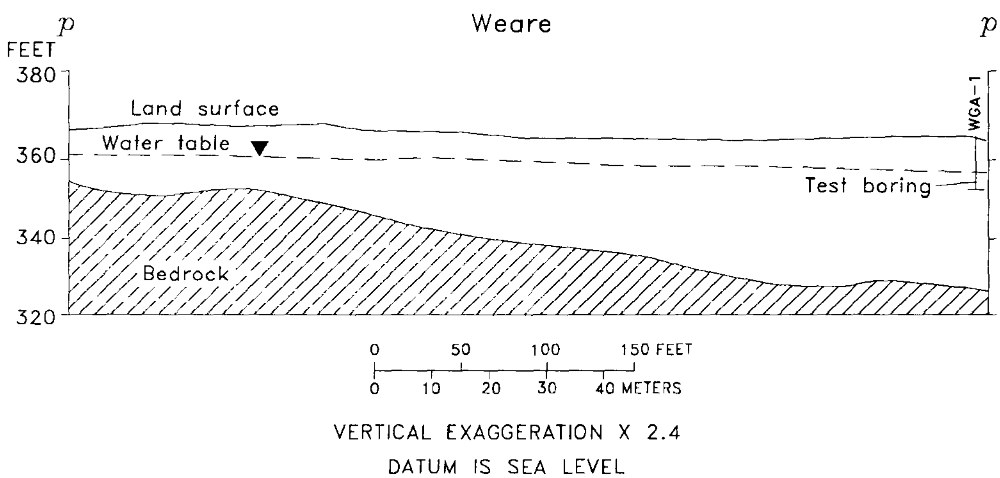
Appendix C23. Geohydrologic sections interpreted from seismic-refraction data for Weare lines h-h′, i-i′, (locations shown on plate 2) and j-j′ (location shown on plate 3).



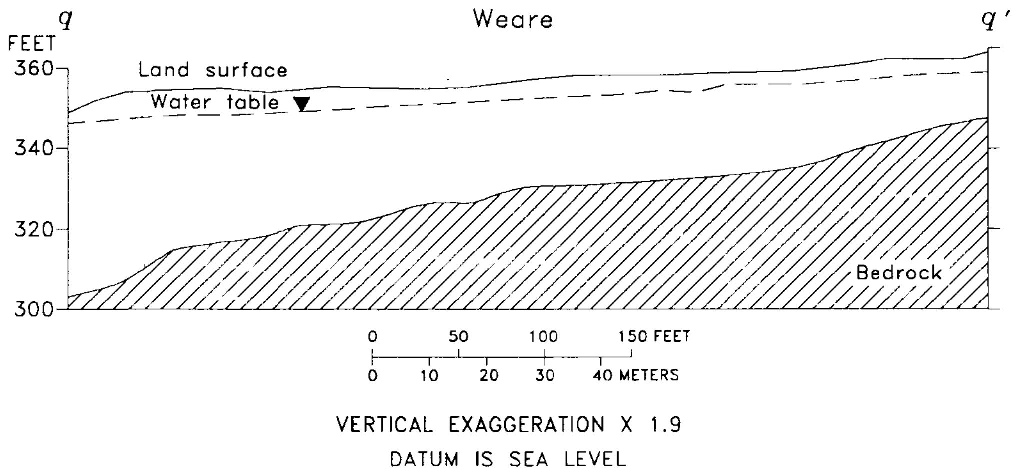
Appendix C24. Geohydrologic sections interpreted from seismic-refraction data for Weare lines k-k′, l-l′, and m-m′ (locations shown on plate 3).







Appendix C25. Geohydrologic sections interpreted from seismic-refraction data for Weare lines n-n´, o-o´, and p-p´ (locations shown on plate 3).



Appendix C26. Geohydrologic sections interpreted from seismic-refraction data for Weare line q-q´ (location shown on plate 3).

APPENDIX D

Appendix D. Low-flow streamflow measurements at miscellaneous sites
[ft³/s, cubic feet per second; ft, feet; mi, mile; Lat, latitude; long, longitude]

Stream	Tributary to	Location	Informal number	Measurements: Date	Measurements: Discharge (ft³/s)
Merrimack River Basin					
Brickyard Brook	Merrimack River	Lat 43°05'23", long 71°28'06", Hillsborough County, Hydrologic Unit 01070002, 50 ft downstream of bridge at State Highway 3A, 0.38 mi northeast of Hooksett Tollgate on Interstate Highway 93, 0.5 mi southwest of Hooksett, N.H.	1	10-06-88 9-07-89	0.15 .38
Merrimack River Tributary	Merrimack River	Lat 43°03'27", long 71°28'05", Hillsborough County, Hydrologic Unit 01070002, upstream of culvert at State Highway 3A, 0.23 mi south of intersection with Cross Road, 1.4 mi southwest of Hooksett Tollgate on Interstate Highway 93, 2.1 mi south of Hooksett, N.H.	2	10-06-88 9-07089	.01 .05
Peters Brook	Merrimack River	Lat 43°03'54", long 71°26'47", Hillsborough County, Hydrologic Unit 01070002, downstream of culvert at U.S. Highway 3, 1.0 mi above mouth, 0.9 mi northwest of intersection with U.S. Highway 3, 2.3 mi southeast of Hooksett, N.H.	3	10-06-88 9-07-89	.84 .86
Peters Brook	Merrimack River	Lat 43°03'52", long 71°27'38", Hillsborough County, Hydrologic Unit 01070002, at old bridge site 200 ft upstream from concrete plant, 700 ft above mouth, 0.9 mi downstream of intersection with U.S. Highway Route 3, 2.0 mi south of Hooksett, N.H.	4	10-06-88 9-07-89	2.15 1.33
Dalton Brook	Merrimack River	Lat 43°03'03", long 71°26'48", Hillsborough County, Hydrologic Unit 01070002, at power line crossing 0.5 mi above mouth, 0.28 mi north of Martin Cemetary, 0.42 mi west of U.S. Highway 3, 3.3 mi southeast of Hooksett, N.H.	5	10-06-88 9-07-89	.04 .44
Messer Brook	Merrimack River	Lat 43°02'41", long 71°27'02", Hillsborough County, Hydrologic Unit 01070002, 100 downstream from bridge at Martins Ferry Road, 100 ft east of intersection with River Road, 0.7 mi west of State Highway 3/28, 3.6 mi southeast of Hooksett, N.H.	6	10-06-88	.65
Black Brook	Merrimack River	Lat 43°00'37", long 71°28'44", Hillsborough County, Hydrologic Unit 01070002, 40 ft downstream of bridge at Front Street, 250 ft south of intersection with Dunbarton Road, 700 ft above mouth, 1 mi northwest of Manchester, N.H.	7	10-06-88	1.87
Piscataquog River	Merrimack River	Lat 43°06'35", Long 71°45'03", Hillsborough County, Hydrologic Unit 01070002, 10 ft downstream from bridge at State Highway 114, 1.2 mi east of Weare Reservoir, 0.9 mi north-west of intersection of State Highway 77, 1.4 mi northwest of Weare, N.H.	8	9-07-89	3.08

Stream	Tributary to	Location	Informal number	Measurements	
				Date	Discharge (ft^3/s)
Merrimack River Basin					
Piscataquog River	Merrimack River	Lat 43°06'43", long 71°43'25", Hillsborough County, Hydrologic Unit 01070002, 200 ft downstream from bridge at Barnard Hill Road, 0.5 mi southwest of intersection of State Highway 77, 1.3 mi east of Chase Village, 1.2 mi northeast of Weare, N.H.	9	9-07-89	5.43
[1]01090800 Piscataquog River	Merrimack River	Lat 43°05'29", long 71°39'36", Hillsborough County, Hydrologic Unit 01070002, on right bank 500 ft downstream from Everett Dam and 1.4 mi southeast of East Weare.	10	9-06-89	8.2
Piscataquog River	Merrimack River	Lat 43°04'58", long 71°38'56", Hillsborough County, Hydrologic Unit 01070002, 500 ft downstream from bridge at River Road, 0.7 mi below Everett Lake, 3.8 mi southeast of Weare, N.H.	11	9-06-89	7.38
Piscataquog River	Merrimack River	Lat 43°03'37", long 71°39'07", Hillsborough County, Hydrologic Unit 01070002, 0.3 mi upstream of bridge at River Road, 2.3 mi below Everett Lake, 4.6 mi southeast of Weare, N.H.	12	9-06-89	7.71
Piscataquog River	Merrimack River	Lat 43°01'58", long 71°38'48", Hillsborough County, Hydrologic Unit 01070002, upstream of bridge at old State Highway 114, 100 ft downstream of dam at Riverdale, 250 ft west of intersection with River Road, 6.1 mi southeast of Weare, N.H.	13	3-24-89 9-06-89	52.8 8.51
Gorham Brook	Piscataquog River	Lat 43°00'28", long 71°37'47", Hillsborough County, Hydrologic Unit 01070002, 10 ft below culvert at State Highway 114 just above confluence with Piscataquog River, 500 ft east of intersection with Parker Rd, 1.5 mi west of Goffstown, N.H.	14	3-24-89 9-06-89	5.69 .44
Piscataquog River	Piscataquog River	Lat 43°01'26", long 71°37'43", Hillsborough County, Hydrologic Unit 01070002, 0.25 mi downstream of bridge at Parker Road, 250 ft downstream of confluence with Gorham Brook, 1.5 mi west of Goffstown, N.H.	15	3-24-89 10-06-88	62.2 8.93
South Branch Piscataquog River	Piscataquog River	Lat 42°58'28", long 71°47'22", Hillsborough County, Hydrologic Unit 01070002, 25 ft below bridge at Journey's End Road, 0.15 mi northeast of intersection with Francestown Turnpike, 1.4 mi southeast of Francestown, N.H.	16	10-07-88 9-06-89	1.74 1.36
Cold Brook	South Branch Piscataquog River	Lat 43°56'07", long 71°44'29", Hillsborough County, Hydrologic Unit 01070002, 0.2 mi upstream from bridge at Mountain Road, 200 ft morthwest of Wilton Road, 0.3 mi southeast of intersection with Francestown Turnpike, 3.7 mi southwest of New Boston, N.H.	17	10-07-88	.79

Stream	Tributary to	Location	Informal number	Measurements	
				Date	Discharge (ft³/s)
		Merrimack River Basin			
South Branch Piscataquog River Tributary No. 2	South Branch Piscataquog River	Lat 43°56'51", long 71°44'18", Hillsborough County, Hydrologic Unit 01070002, downstream side of culvert at Butterfield Mill Road, 0.9 mi west of intersection with Lyndeborough Road, 0.34 mi east of Lyndeborough town line, 3.0 mi south-west of New Boston, N.H.	18	10-07-88	.015
South Branch Piscataquog River Tributary No. 3	South Branch Piscataquog River	Lat 42°56'51", long 71°44'08", Hillsborough County, Hydrologic Unit 01070002, upstream of culvert at Butterfield Mill road, 0.2 mi above mouth, 0.8 mi west of intersection with Lyndeboro Road, 0.5 mi east of Lyndeboro town line, 2.9 mi southwest of New Boston, N.H.	19	10-07-88	.22
Meadow Brook	South Branch Piscataquog River	Lat 42°57'27", long 71°42'29", Hillsborough County, Hydrologic Unit 01070002, 50 ft above mouth off Lyndeboro Road, 0.6 mi southwest of intersection with State Highway 13, 1.5 mi southwest of New Boston, N.H.	20	10-07-88	.10
South Branch Piscataquog River	South Branch Piscataquog River	Lat 42°57'29", long 71°42'33", Hillsborough County, Hydrologic Unit 01070002, downstream of bridge at Lyndeboro Road, 0.66 mi west of the intersection with State Highway 13, 1.5 mi southwest of south of New Boston, N.H.	21	10-06-88 9-09-89	8.60 6.13
South Branch Piscataquog River	South Branch Piscataquog River	Lat 42°58'10", long 71°41'52", Hillsborough County, Hydrologic Unit 01070002, 100 ft downstream of bridge at State Highway 13, 0.6 mi north of intersection with Lyndeborough Road, 0.5 mi south of New Boston, N.H.	22	9-09-89	8.30
South Branch Piscataquog River	South Branch Piscataquog River	Lat 43°00'00", long 71°40'13", Hillsborough County, Hydrologic Unit 01070002, 0.4 mi upstream of bridge at Gregg Mill Road off State Highway 13, 2.0 mi northeast of New Boston, N.H.	23	10-06-88	8.80
South Branch Piscataquog River	Piscataquog River	Lat 43°00'04", long 71°39'47", Hillsborough County, Hydrologic Unit 01070002, 400 ft upstream from bridge at Gregg Mill Road off State Highway 13, 700 ft upstream from confluence of Middle Branch Piscataquog River, 2.3 mi northeast of New Boston, N.H.	24	9-07-89	9.67
Middle Branch Piscataquog River	Piscataquog River	Lat 43°01'11", long 71°41'25", Hillsborough County, Hydrologic Unit 01070002, 50 ft downstream from bridge at State Highway 77, 400 ft northwest of Middle Branch Road, 0.38 mi from the New Boston-Weare town line, 3.0 mi north of New Boston, N.H.	25	9-07-89	1.62

Stream	Tributary to	Location	Informal number	Measurements Date	Measurements Discharge (ft^3/s)
		Merrimack River Basin			
Middle Branch Piscataquog River	Merrimack River	Lat 43°00'21", long 71°39'52", Hillsborough County, Hydrologic Unit 01070002, 40 ft upstream from bridge at Riverdale road, 100 ft east of Gregg Mill Road, 0.35 mi upstream from confluence with South Branch Piscataquog River, 2.5 mi northeast of New Boston, N.H.	26	10-06-88	3.56
01091000 South Branch Piscataquog River	Piscataquog River	Lat 43°00'49", long 71°38'31", Hillsborough County, HydrologicUnit 01070002, on right bank 20 ft upstream from Highway bridge, 1.4 mi upstream from mouth, and 2.2 mi west of Goffstown, N.H.	27	10-06-88 3-24-89 4-26-89 9-06-89 9-14-89	12.8 66 166 9.9 9.9
South Branch Piscataquog River Tributary	South Branch Piscataquog River	Lat 43°00'55", long 71°38'03", Hillsborough County, Hydrologic Unit 01070002, upstream side culvert at State Highway 13, 0.22 mi west of Goffstown-New Boston town line, 0.4 mi east of gaging station on South Branch Piscataquog River, 4.0 mi northeast of New Boston, N.H.	28	3-24-89	.19
Piscataquog River	Merrimack River	Lat 43°01'21", long 71°37'13", Hillsborough County, Hydrologic Unit 01070002, 700 ft west of the Goffstown well field off State Highway 114, 500 ft downstream from the confluence of the South Branch Piscataquog River, 1 mi west of Goffstown, N.H.	29	10-07-88 3-24-89 9-06-89	21.7 137 24.2
Piscataquog River	Merrimack River	Lat 43°01'16", long 71°36'56", Hillsborough County, Hydrologic Unit 01070002, 250 ft downstream of Goffstown well field off State Highway 114, 0.3 mi downstream from confluence of the South Branch Piscataquog River, 0.8 mi west of Goffstown, N.H.	30	4-28-89	281
Bog Brook	Merrimack River	Lat 43°00'55", long 71°36'40", Hillsborough County, Hydrologic Unit 01070002, upstream from bridge at State Highway 13, 0.6 mi west of intersection with State Highway 114, 0.25 mi above mouth, 0.6 mi west of Goffstown, N.H.	31	9-24-89 9-06-89	5.3 .23
Bog Brook	Merrimack River	Lat 43°01'04", long 71°36'27", Hillsborough County, Hydrologic Unit 01070002, immediately upstream from mouth, 0.36 mi west of State Highway 13 bridge over Picataquog River, at Goffstown, N.H.	32	3-24-89	5.4
Whittle Brook	Merrimack River	Lat 43°00'57", long 71°36'01", Hillsborough County, Hydrologic Unit 01070002, upstream from bridge at State Highway 13, 500 ft west of intersection of State Highway 114, 0.28 mi east of intersection of Bog Road, 1,000 ft above mouth, at Goffstown, N.H.	33	3-24-89 9-06-89	1.1 .24

Appendix D. Low-flow streamflow measurements at miscellaneous sites--Continued

Stream	Tributary to	Location	Informal number	Measurements	
				Date	Discharge (ft^3/s)
Merrimack River Basin					
Whittle Brook	Merrimack River	Lat 43°01'02", long 71°36'11", Hillsborough County, Hydrologic Unit 01070002, immediately upstream of mouth 1,000 ft west of State Highway 13 bridge, over Piscataquog River, at Goffstown, N.H.	34	3-24-89	1.2
Piscataquog River Tributary	Piscataquog River	Lat 43°01'16", long 71°36'08", Hillsborough County, Hydrologic Unit 01070002, upstream side culvert at State Highway 114, 100 ft west of First Avenue, 550 ft west of State Highway 13, at Goffstown, N.H.	35	3-24-89	.20
[1]01091500 Piscataquog River	Merrimack River	Lat 43°00'58", long 71°33'03", Hillsborough County, Hydrologic Unit 01070002, 0.2 mi upstream from Harry Brook, 0.9 mi downstream from Glen Lake, and 2.5 mi east of Goffstown, N.H.	36	9-06-89	26.1
Piscataquog River	Merrimack River	Lat 43°59'26", long 71°29'41", Hillsborough County, Hydrologic Unit 01070002, 700 ft downstram of Nazaire Biron Bridge, at Kelly Street 0.28 mi northeast of intersection with State Highway 114A, 1.5 mi above mouth, 1.6 mi west of Manchester, N.H.	37	10-07-88 9-07-89	33.96 14.76
Bowman Brook	Merrimack River	Lat 43°57'18", long 71°29'07", Hillsborough County, Hydrologic Unit 01070002, downstream side of culvert at State Route 101, 0.47 mi northwest of intersection with U.S. Highway 3, 1.3 mi east of Bedford, N.H.	38	10-07-88	.02
Bowman Brook	Merrimack River	Lat 43°57'17", long 71°28'25", Hillsborough County, Hydrologic Unit 01070002, downstream of culvert at Interstate Highway 293, immediately above mouth, 0.5 mi north of intersection with State Highway 101, 1.8 mi east of Bedford, N.H.	39	9-07-89	2.59
Maple Falls Brook	Clark Pond	Lat 43°01'46", long 71°21'34", Hillsborough County, Hydrologic Unit 01070002, 300 ft upstream of State Highway 101 off Tower Hill Road, 0.5 mi below outlet of Tower Hill Pond, 1.9 mi northwest of Auburn, N.H.	40	9-06-89	.27
Clark Pond Brook	Sucker Brook	Lat 43°01'10", long 71°21'09", Hillsborough County, Hydrologic Unit 01070002, 300 ft downstream from Clark Pond outlet, upstream of Depot Road, 0.21 mi east of intersection with Hooksett Road, 1.1 mi north of Auburn, N.H.	41	9-06-89	.30
Cohas Brook	Merrimack River	Lat 42°57'36", long 71°25'06", Hillsborough County, Hydrologic Unit 01070002, 20 ft downstream of bridge at State Highway 28A, 350 ft south of intersection with State Route 101, 2.8 mi southeast of Manchester, N.H.	42	9-06-89	5.67

Stream	Tributary to	Location	Informal number	Measurements Date	Dis-charge (ft³/s)
		Merrimack River Basin			
Cohas Brook	Merrimack River	Lat 42°55'53", long 71°27'08", Hillsborough County, Hydrologic Unit 01070002, 250 ft downstream of dam at outlet of Pine Island Pond, upstream from bridge at Brown Avenue (Route 3A), 3.5 mi south of Manchester, N.H.	43	9-06-89	5.75
Sebbins Brook	Pointer Club Brook	Lat 42°54'43", long 71°27'35", Hillsborough County, Hydrologic Unit 01070002, 40 ft downstream of culvert at private road crossing 500 ft above mouth, 100 ft west of intersection with U.S. Highway 3, 0.15 mi north of Merrimack, N.H. town line, 4.5 mi southeast of Bedford, N.H.	44	10-07-89	.92
Pointer Club Brook	Merrimack River	Lat 42°54'36", long 71°27'31", Hillsborough County, Hydrologic Unit 01070002, upstream side of culvert at U.S. Highway 3, at Merrimack-Bedord town line, 0.28 mi above mouth, 4.5 mi southeast of Bedford, N.H.	45	10-07-88 9-06-89	1.97 2.03
Furnace Brook	Souhegan River	Lat 42°46'21", long 71°52'33", Hillsborough County, Hydrologic Unit 01070002, 200 ft downstream from culvert at Appleton Road, 1.3 mi northwest of intersection with State Highway 123/124, 1.6 mi northwest of New Ipswich, N.H.	46	10-06-88	.18
Furnace Brook	Souhegan River	Lat 42°46'12", long 71°52'08", Hillsborough County, Hydrologic Unit 01070002, 20 ft upstream of culvert at Appleton Road, 0.85 mi northwest of intersection with State Highway 123/124, 1.2 mi northwest of New Ipswich, N.H.	47	10-06-88 9-06-89	.45 .38
Furnace Brook	Souhegan River	Lat 42°45'52", long 71°51'28", Hillsborough County, Hydrologic Unit 01070002, 20 ft upstream of bridge at Wyman Road, 600 ft downstream of N.H. WRD Reservoir, 0.4 mi north of intersection with State Highway 123/124, 0.5 mi northwest of New Ipswich, N.H.	48	10-06-88 9-06-89	.54 .81
Furnace Brook	Souhegan River	Lat 42°45'32", long 71°50'47", Hillsborough County, Hydrologic Unit 01070002, 20 ft downstream of culvert at Wilton Road, 500 ft north of intersection with State Highway 123/124, at New Ipswich, N.H.	49	10-06-88	.85
West Branch River	Souhegan River	Lat 42°44'13", long 71°50'04", Hillsborough County, Hydrologic Unit 01070002, upstream from dam and roadway at Smithville, 1.2 mi northwest of Ashby Road-River Road intersection, 0.5 mi downstream of Smithville Flood Control Reservoir, 1.5 mi southwest of New Ipswich, N.H.	50	10-06-88 9-06-89	4.74 1.33

Stream	Tributary to	Location	Informal number	Measurements Date	Measurements Discharge (ft^3/s)
		Merrimack River Basin			
West Branch River	Souhegan River	Lat 42°43'53", long 71°50'53", Hillsborough County, Hydrologic Unit 01070002, 100 ft downstream of culvert at River Road, 0.25 mi northeast of intersection with Ashby Road, 400 ft above confluence with Souhegan River, 2.0 mi southeast of New Ipswich, N.H.	51	10-06-88 9-06-89	7.96 1.82
Souhegan River	Merrimack River	Lat 42°43'40", long 71°50'53", Hillsborough County, Hydrologic Unit 01070002, 100 ft downstream of culvert at Ashby Road, 0.1 mi southeast of intersection with River Road, 1.2 mi north of the Massachusetts-New Hampshire Stateline, and 2.2 mi southeast of New Ipswich, N.H.	52	10-06-88 9-06-89	2.02 3.11
Souhegan River	Merrimack River	Lat 42°45'00", long 71°52'18", Hillsborough County, Hydrologic Unit 01070002, immediately downstream of Water Loom Pond outlet, 0.5 mi southwest of High Bridge, 1.0 mi southeast of New Ipswich, N.H.	53	10-06-88	29.3
Gould Mill Brook	Merrimack River	Lat 42°44'22", long 71°42'57", Hillsborough County, Hydrologic Unit 01070004, 30 ft upstream from culvert at Withee Brook Road, 0.5 mi west of Mason Brookline town line, 300 ft south of the intersection with Mason-Brookline Road, 2.8 mi east of Mason, N.H.	54	10-06-88 9-07-89	.08 .02
Gould Mill Brook	Lancy Brook	Lat 42°46'09", long 71°44'09", Hillsborough County, Hydrologic Unit 01070002, 60 ft downstream from culvert at Campbell Mill Road, 0.3 mi west of Mason-Brookline townline, 0.25 mi southwest of intersection with Mason-Brookline Road, 2.8 mi southeast of Mason, N.H.	55	10-06-88 9-07-89	.10 .09
Gould Mill Brook	Lancy Brook	Lat 42°44'28", long 71°42'08", Hillsborough County, Hydrologic Unit 01070002, 15 ft downstream from culvert at Mason-Brookline Road, 0.4 mi east of the Mason-Brookline town line, 0.28 mi upstream from Lancy Brook, and 2.0 mi west of Brookline, N.H.	56	10-06-88 9-07-89	.89 .71
Black Brook	Mitchell River	Lat 42°46'13", long 71°44'57", Hillsborough County, Hydrologic Unit 01070002, 20 ft below dam outlet off of Russell Road, 0.4 mi west of intersection with Starch Mill Road, 1.8 mi northeast of Mason, N.H.	57	10-06-88	.52
Spaulding Brook	Black Brook	Lat 42°46'09", long 71°44'09", Hillsborough County, Hydrologic Unit 01070002, 0.2 mi downstream from confluence of Black Brook, 0.3 mi north-east of the Starch Mill Road-Black Brook Road intersection, 2.5 mi northeast of Mason, N.H.	58	10-06-88	.03

Appendix D. Low-flow streamflow measurements at miscellaneous sites--Continued

Stream	Tributary to	Location	Informal number	Measurements Date	Measurements Discharge (ft^3/s)
		Merrimack River Basin			
Rocky Brook	Mason Brook	Lat 42°43'39", long 71°45'44", Hillsborough County, Hydrologic Unit 01070004, immediately upstream from culvert at State Highway 123, 0.5 mi south of intersection with Depot Road, 1.2 mi southeast of Mason, N.H.	59	10-06-88	0.09

[1] U.S. Geological Survey gaging stations and identification number.