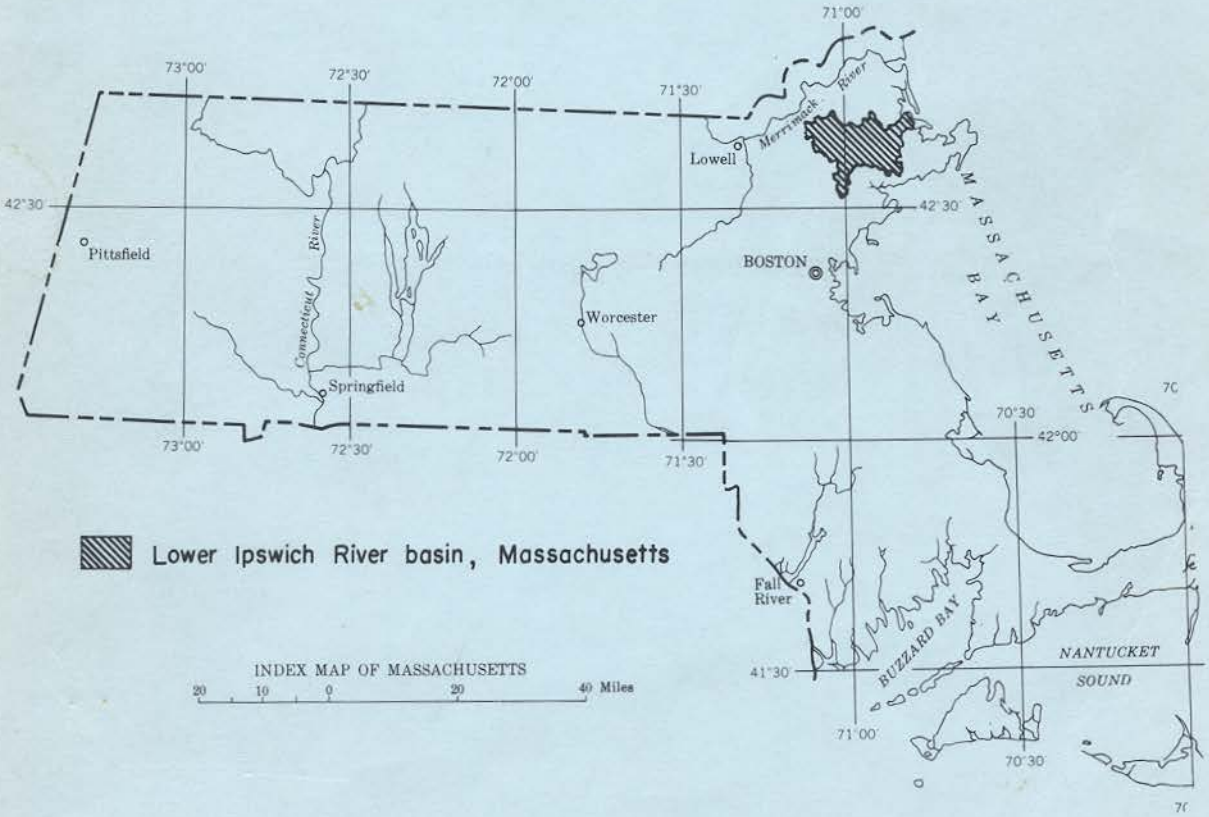
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MASSACHUSETTS BASIC-DATA REPORT NO. 2
GROUND-WATER SERIES

LOWER IPSWICH RIVER DRAINAGE BASIN

By

EDWARD A. SAMMEL and JOHN A. BAKER



PREPARED IN COOPERATION WITH
THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
1962

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LOWER IPSWICH RIVER BASIN

Records of wells, materials tests, and chemical analyses of water in the lower Ipswich River basin, Massachusetts

By

Edward A. Sammel and John A. Baker

Prepared in cooperation with

THE COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF PUBLIC WORKS

Boston, Massachusetts

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CONTENTS

Page

Introduction..... 1

Well-numbering and location systems..... 2

ILLUSTRATIONS

Figure 1. Map of Ipswich River drainage basin, Massachusetts showing Wilmington-Reading area and locations of selected wells, test holes, [redacted] below the stream-gaging station at South Middleton.....(In pocket)

2. Sketch illustrating well-location system..... 4

TABLES

Table 1. Geologic units in the lower Ipswich River basin, Massachusetts, and their water-bearing characteristics..... 5

2. Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts..... 6

3. Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts..... 30

TABLES--Continued

Page

Table 4. Chemical analyses of water from selected wells and springs in the lower Ipswich River basin, Massachusetts..... 41

5. Chemical analyses of pore water extracted from clays of the marine unit in the lower Ipswich River basin, Massachusetts..... 42

6. Water levels in observation wells in the lower Ipswich River basin, Massachusetts..... 43

7. Pumpage of ground water for municipal supply in the lower Ipswich River basin, Massachusetts..... 47

INTRODUCTION

The lower Ipswich River basin is that part of the Ipswich River drainage basin below the Geological Survey stream-gaging station at South Middleton in northeastern Massachusetts (fig. 1). It includes about 110 square miles between the gaging station at South Middleton and the Atlantic Ocean.

This report presents basic data collected as part of an investigation of the geology and ground-water resources of the lower Ipswich River basin, Massachusetts by the U. S. Geological Survey in cooperation with the Massachusetts Department of Public Works. The data have been prepared for release in order to make available to the public basic ground-water data that will be useful in the planning of water-resources development.

An earlier Basic-Data Report (Baker and Sammel, 1961) presents data pertaining to ground-water conditions in the upper part of the Ipswich River basin (the Wilmington-Reading area).

Most of the data contained in this report were collected by Edward A. Sammel and Henry G. Healy during the period 1958-60. Assisting with the data collection were John K. Colby, Edward A. Sossen, and Gordon S. Bird. The data include records of 733 wells or groups of wells and test holes (table 2); logs of 242 wells and test holes (table 3); chemical analyses of 21 water samples (tables 4 and 5); measurements of water levels in 36 wells (table 6); and pumpage of ground water for municipal supply (table 7). The locations of wells and test holes are shown on figure 1.

Table 1 is intended as an aid in determining the general characteristics and relative excellence as aquifers of the water-bearing units penetrated by wells and test wells listed in table 2.

WELL-NUMBERING AND LOCATION SYSTEMS

In Massachusetts each well is designated by a symbol whose first term is the name of the town or city in which the well is located and whose second term is a number that is assigned in the order in which the well was inventoried within the town or city. A separate series of numbers beginning with 1 is used within each town or city. In tables the name of the town and the number are given, but on the map (fig. 1) only the number appears beside the symbol of the well.

For ease in locating wells and test holes on the map a location system based on the $7\frac{1}{2}$-minute topographic quadrangles in New England is used. In this system each $7\frac{1}{2}$-minute quadrangle is designated by a capital letter and a number beginning with A1 for the Glenville quadrangle, Connecticut. From here the quadrangles are lettered from west to east and numbered from south to north. Each $7\frac{1}{2}$-minute quadrangle is subdivided into nine $2\frac{1}{2}$-minute rectangles, and each $2\frac{1}{2}$-minute rectangle is subdivided into nine 50-second rectangles, as shown on the sketch (fig. 2). The location designation for each well and test hole is listed in table 2. On the well-location map (fig. 1), the quadrangle designators are indicated on the margins and the $2\frac{1}{2}$-minute rectangles are bounded by the lines of latitude and longitude, but the 50-second rectangles are not shown.

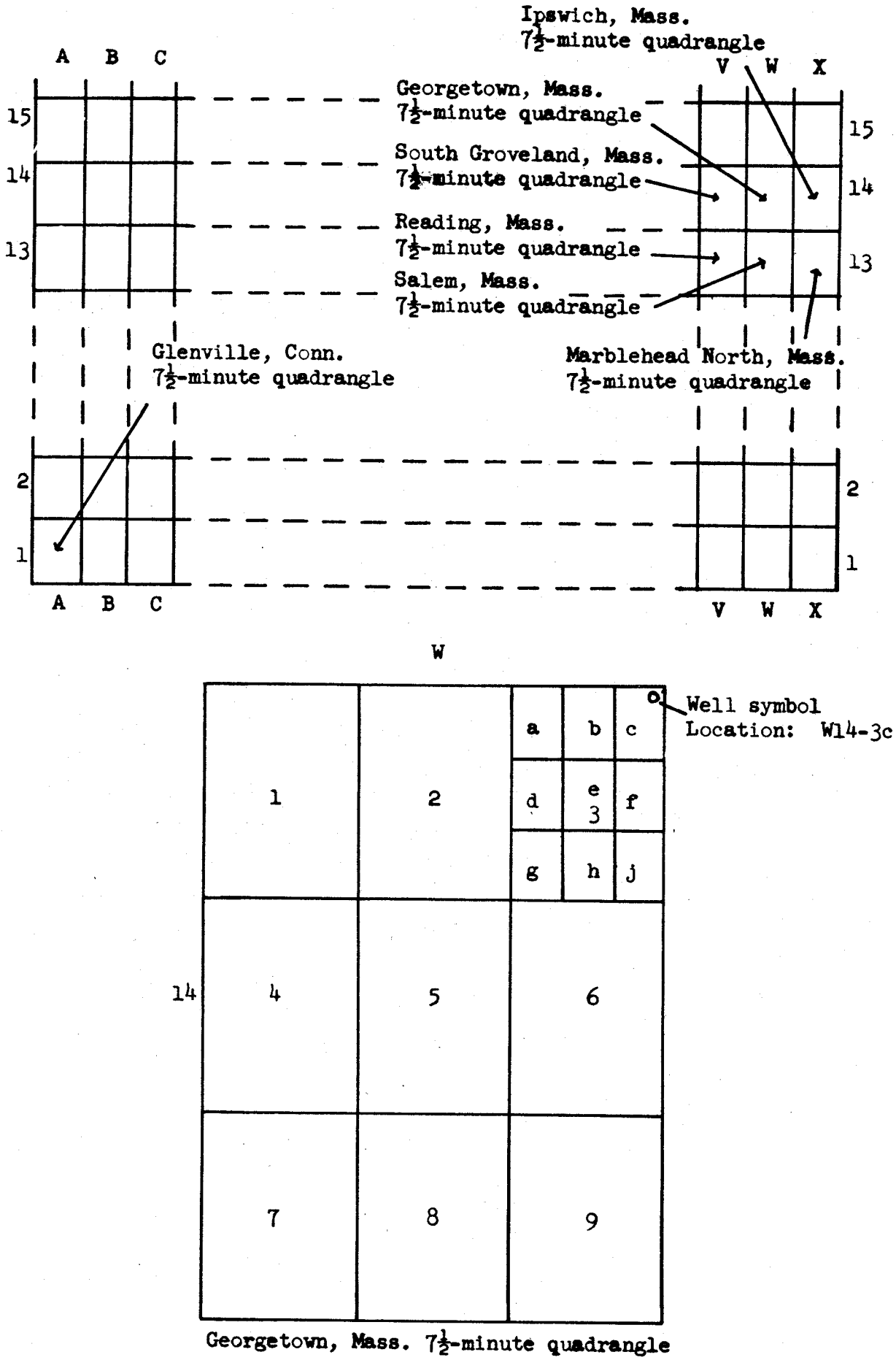


Figure 2 .--Sketch illustrating well-location system.

Table 1.--Geologic units in the lower Ipswich River basin, Massachusetts, and their water-bearing characteristics

Geologic unit	Thickness (feet)	Character	Water-bearing characteristics
Alluvium	-	Sand and silt; gravel predominates in stream channels at some places.	Does not form a distinct water-bearing unit. Where it occurs it is included with the unit that underlies it.
Swamp deposits	0-15	Peat and muck interbedded or intermixed in some places with sand or silt.	Do not yield ground water to wells. May retard the movement of water between the swamp surfaces and more permeable materials, such as outwash, that underlie swamp deposits in most of the area.
Wind deposits	0-15	Sand and silt.	Do not form a distinct water-bearing unit. Sufficiently permeable to permit water to percolate freely from the surface to underlying units.
Outwash	0-78	Chiefly sand; contains large amounts of silt and clay and some gravel.	Yields small to large quantities of water to wells. Reported yields of 20 wells ranged from 3 to 700 gpm. Median yield was 24 gpm. Stores large amounts of ground water, provides supplementary storage to adjacent or subjacent ice-contact deposits, and furnishes a large proportion of the water forming the base flow of the streams.
Marine unit	0-77	Clay and silt; subordinate amounts of sand and, locally, gravel.	Cannot be considered an aquifer at most places but yields small to moderate quantities of water at a few places where the deposits contain sand or gravel. Stores large amounts of ground water. Clay and silt may retard the movement of water to underlying units and at places confine water in more permeable materials, such as the ice-contact deposits, that underlie the marine unit.
Ice-contact deposits	0-78	Sand and gravel; subordinate amounts of clay and silt.	Yield small to large quantities of water to wells. Reported yields of 38 wells ranged from 3 to 730 gpm. Median yield was 36 gpm. Individual deposits may differ markedly in composition, sorting, and permeability and each deposit must be explored to find the more permeable materials.
Till	0-208	Poorly sorted mixture of clay, silt, sand, gravel, and boulders.	Yields small quantities of water to dug wells throughout the area. Because it is poorly sorted and has a large range in particle size, the permeability is small. Many shallow wells reportedly go dry in summer months.
Bedrock	-	Chiefly igneous and metamorphic rocks.	Yields small quantities of water from joints and fractures. Median yield of 60 wells was 8 gpm.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts

Well no: For explanation of well-numbering system, see text.
Location: For explanation of well-location system, see text.
Altitude of land-surface datum: Altitudes expressed in feet and tenths, or in feet, tenths, and hundredths are instrumentally determined; those in whole feet are interpolated from topographic maps. Datum is mean sea level.
Type of well: A, augered; Dn, driven; Dr, drilled; Du, dug; Du-Dr, dug and drilled; Du-Dn, dug and driven; GP, gravel-packed; J, jetted; T, materials-test hole.
Depth of well: Depths expressed in feet and tenths are measured; those in whole feet are reported.
Depth to bedrock or refusal: An "R" appended to the depth indicates the well or test hole was bottomed at refusal which may be bedrock, a boulder, a hard or cemented layer, or till.

Level: Water levels expressed in feet and tenths, or in feet, tenths, and hundredths are measured; those expressed in whole feet are reported. Depths are below land-surface datum, except when preceded by a + indicating they are above land-surface datum.
Use: C, commercial or industrial; D, domestic; N, unused; O, U. S. Geol. Survey observation well; PS, public supply; S, stock; T, test.
Type of pump: B, bucket; C, centrifugal; H, hand pump; J, jet; Pn, piston; T, turbine.
Remarks: A, abandoned and destroyed; L, log in table 3; Y, yield in gallons per minute (gpm); dd, drawdown in feet produced by pumping at preceding rate; C, chemical analysis in table 4; T, temperature in degrees Fahrenheit.

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY							
								ANDOVER							
139	V14-7d	W. Buchan	1925	265	Du	16.2	36	-	-	Till	11.14	7-10-57	S,N	-	T 53.
142	V14-7g	Worthen	-	295	Du	23.4	50	-	-	do.	15.2	7-11-57	D,S,N	-	T 53.
144	V14-7g	H. Clark	-	310	Du	14.15	36	-	-	do.	10.28	7-18-57	D,N	-	
145	V14-7g	J. Torrey	-	285	Du	6.8	30	-	-	do.	5.3	7-11-57	N	-	
150	V14-7a	Foster	-	245	Du	7.8	30	-	-	do.	6.85	7- 3-57	N	-	
152	V14-7d	A. Guidott	-	265	Du	15.6	36	-	-	do.	6.17	7-10-57	N	-	T 53.
153	V14-7h	U. S. Geol. Survey	1958	195	A,T	23	4	-	-	-	-	-	-	-	A. L.
155	V14-7h	do.	1958	190	A,T	12	4	12R	-	-	-	-	-	-	A. L.
								BEVERLY							
16	X13-4c	Mass.Dept.Pub.Wks.	1951	67.5	Dn,T	6.6	1	6.6R	-	-	-	-	-	-	A. L.
23	X13-1h	R. S. West	1919	80	Du	15.5	20 ft.	-	Sand and gravel	Ice-contact deposits	2.54	6-24-58	O	None	T 49.
24	X13-1g	Breiling	-	95	Du	9.5	42	-	-	do.	4.00	6-24-58	O	None	A. T 50.
26	X13-4b	Amory Parker	1928	55	Dn	28	2	-	Sand and gravel	do.	-	-	D	Pn	3 driven wells pumped together supply large estate.
27	X13-4a	C. A. Foster	1948	70	Du	11.7	42	-	Gravel	do.	7.56	8- 4-59	D	C	
28	X13-4a	do.	1950	55	Dn	12	3	-	Sand and gravel	do.	-	-	D	-	
39	W13-6b	Mass.Dept.Pub.Wks.	1943	44.1	Dn,T	38.2	1	-	-	-	-	-	-	-	A. L. Approximate water level at altitude of 43 feet.
49	W13-6c	do.	1943	74.4	Dn,T	17.0	1	17.0R	-	-	-	-	-	-	A. L.
80	X13-4b	do.	1943	82.2	Dn,T	7.0	1	7.0R	-	-	-	-	-	-	A. L.
81	X13-1g	U. S. Geol. Survey	1959	50	A,T	52	4	52R	-	-	-	-	-	-	A. L.
82	X13-4a	Charles Hammer	1959	110	Dr	320	6	8	-	Bedrock	-	-	D	-	Y 6; dd 215 after 3 hours pumping.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								BOXFORD							
5	W14-7e	Mass.Dept.Pub.Wks.	1949	42.3	Dn,T	34.4	1	34.4R	-	-	-	-	-	-	A. L.
10	W14-7e	do.	1949	48.6	Dn,T	30.2	1	30.2R	-	-	-	-	-	-	A. L.
30	W14-4h	do.	1949	72.7	Dn,T	32.0	1	32.0R	-	-	-	-	-	-	A. L.
32	V14-9b	R. Conner	-	110	Dn	30	4	-	-	Outwash	-	-	D	-	Y 3.
34	V14-9b	C. Nielsen	-	105	Du	8.0	24	-	"Sand and gravel"	Till	2.35	7-31-57	D,N	-	
35	V14-9b	F. Hey	-	110	Du	7.9	20	-	-	do.	5.72	7-31-57	D	-	
36	V14-9b	A. Peabody	-	110	Du	9.3	36	-	Sand and gravel	Outwash	7.79	7-31-57	D,S	-	
37	V14-9b	C. McElman	-	103	Du	3.9	24	-	do.	do.	2.48	7-31-57	D	-	Well reportedly is an improved spring.
38	V14-9b	S. Harnis	1952	107	Dr	97	6	8	-	Bedrock	15	5- -52	D	-	Y 3.5.
39	V14-9b	Sullivan	-	95	Du	6.1	9	-	-	Outwash	"dry"	7-31-57	D,N	-	Water level below bottom of well on date of measurement.
40	V14-9b	D. Donnan	-	125	Du	12.9	40	-	-	Till	7.26	8- 2-57	D	-	
41	V14-9b	J. Vernon	-	105	Du	10.2	36	-	-	do.	9.36	8- 1-57	D	-	
44	V14-9b	A. Riggs	1954	110	Dr	117	6	34	-	Bedrock	-	-	D	-	Y 5.5.
45	V14-9b	K. Lynge	-	115	Du	12.0	40	-	-	Outwash	9.64	8- 1-57	D,N	-	Well reportedly "goes dry when used".
46	V14-6h	E. Mortimer	-	128	Du	12.6	40	12.6	Silty clay	do.	11.69	8- 1-57	D	-	
47	V14-6h	Bishop Sherrill	1952	125	Dn	35	2½	-	Sand and gravel	do.	-	-	D	-	
49	V14-9b	B. Perley	1925	100	Dn	30	2½	-	Sand	do.	-	-	D	-	
51	V14-9c	H. Moore	-	98	Du-Dn	14.5	24	-	do.	do.	13.70	8- 2-57	D	-	
52	V14-9c	T. Cargill, Sr.	1933	100	Dr	52.9	6	18	-	Bedrock	13.82	8- 5-57	D	-	Y 9-10. C.
53	V14-9c	M. Lord	-	100	Du	13.7	30	-	Sand	Outwash	11.49	8- 2-57	D	-	
54	V14-9c	L. Stout	-	100	Du	26	-	-	do.	do.	20	7- 5-57	D	-	
55	V14-9c	Lane	-	100	Dr	158	6	-	-	Bedrock	-	-	D	-	
56	V14-9c	W. Haynes	-	100	Du	16.4	36	-	Sand and gravel	Outwash	11.67	8- 5-57	D	-	
57	V14-9c	N. Meeker	-	100	Dn	20	2½	-	do.	do.	-	-	D	-	
58	V14-9b	J. Baer	-	100	Du	12	24	-	do.	do.	10.50	8- 5-57	D	-	
59	V14-9c	G. Russell	1953	100	Dn	13	2½	13	Gravel	do.	-	-	D,N	-	Y 5.
60	V14-9c	C. Russell	1935	100	Dn	15	2½	-	do.	do.	-	-	D	-	Y 5.
61	V14-9c	W. Gilford	-	100	Du	14.9	50	-	Sand and gravel	do.	12.96	8- 6-57	D	-	
63	V14-9c	F. Eaton	1946	100	Dn	18	2½	18	do.	do.	-	-	D	-	
64	V14-9c	L. Packard	1926	100	Dn	15	2½	-	do.	do.	-	-	D	-	Y 10.
65	V14-6j	W. Dorman	1953	131	Dr	96	6	-	-	Bedrock	-	-	D	-	Y 10.
66	V14-6j	do.	-	131	Du	17.5	26	-	Sand and gravel	Outwash	15.16	8- 6-57	D	-	
67	V14-6j	do.	-	128	Du	12.9	45	-	do.	do.	12.35	8- 6-57	D	-	
68	V14-6h	do.	-	140	Du	12.8	30	-	do.	Ice-contact deposits	"dry"	8- 6-57	D,N	-	Water level below bottom of well on date of measurement.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								BOXFORD (Continued)							
69	V14-6j	V. Childs	1957	130	Dr	88	6	-	-	Bedrock	-	-	D	-	Y 8.
73	V14-6e	Camp Masconomet	1951	115	Dn	15	2½	-	Sand and gravel	Ice-contact deposits	10	7- 1-51	PS	-	Y 5. Well supplies 150 day campers.
74	V14-6e	A. Gingrandi	-	118	Du	10.2	36	-	do.	do.	7.70	8- 7-57	D	-	
75	V14-6e	R. Martyn	1949	145	Dr	150	6	6	-	Bedrock	30	2- -49	D	-	Y 5.
76	V14-6e	M. Alper	-	122	Dr	160	6	-	-	do.	-	-	D	-	
77	V14-6e	R. Broderick	1951	108	Dn	27	2½	-	Sand and gravel	Ice-contact deposits	-	-	D	-	
78	V14-9a	J. Parkhurst	-	125	Du	16.9	36	-	-	Till	16.70	8- 7-57	D,N	-	
79	W14-7a	C. Nelson	-	100	Du	15.4	48	-	Sand and gravel	Outwash	12.55	8- 8-57	N,O	None	
80	V14-9c	G. Starrett	1952	90	Dn	35	2½	-	do.	do.	-	-	D,S	-	Y 35.
81	V14-9c	R. Conner	-	90	Du	23.5	30	-	do.	do.	16.85	8- 8-57	D,N	-	
82	V14-9c	N. Love	-	83	Du	14.3	24	-	do.	do.	12.84	8- 8-57	D	-	
83	V14-9c	B. Atwood, Jr.	-	98	Du	19.0	36	-	-	do.	16.57	8-19-57	D,N	-	
84	V14-9f	L. Atherton	-	91	Du	18.9	36	-	Sand and gravel	do.	14.17	8- 8-57	D	-	
85	V14-9f	P. Gould	1948	90	Dn	21	2½	-	do.	do.	8	8- -48	D	-	
86	V14-9f	F. Gould	-	87	Du	17.9	36	17.9	do.	do.	14.52	8- 8-57	D	H	
88	V14-5b	Reynolds	-	158	Du	15.4	38	-	-	Till	13.95	8-14-57	D,N	None	
97	V14-6a	C. Skinner	-	160	Du	14.2	36	-	-	Ice-contact deposits	13.31	8-16-57	D	-	
98	V14-6a	L. Curtis	-	160	Du	15.1	24	-	-	do.	14.24	8-16-57	D	-	Pumps dry every summer; requires 6 hours for recovery.
99	V14-6a	R. Hopping	-	172	Du	6.3	40	-	Sand	do.	5.60	8-15-57	D,N	-	
100	V14-6e	G. Wood	-	133	Dr	105	6	4	-	Bedrock	8	2- -56	D	-	Y 12.5.
101	V14-6a	F. Sturges	1956	162	Dr	82	6	-	-	do.	-	-	D	-	Y 17.
102	V14-6e	W. Gullage	1954	150	Dr	107	6	18	-	do.	-	-	D	-	Y 15.
103	V14-6e	W. MacLernon	1955	145	Du	11.1	36	-	-	Ice-contact deposits	8.32	8-16-57	D	-	
104	V14-6e	A. Rotsko	1952	140	Dr	116	6	-	-	Bedrock	-	-	D	-	
105	V14-6e	R. Kelley	1954	128	Du	13.2	24	-	Sand	Ice-contact deposits	7.54	8-16-57	D	-	
106	V14-6e	R. Dudley, Jr.	-	135	Du	14.7	30	-	do.	do.	10.44	8-16-57	D	-	
107	V14-6f	North Bennett St. Industrial Camp	-	130	Dr	225	6	-	-	Bedrock	-	-	PS	-	Well supplies 48 people.
108	V14-6f	R. Bowler, Jr.	-	143	Du	13.7	36	-	Sand	Ice-contact deposits	11.16	8-16-57	D	-	
109	V14-6f	R. Perley	1956	140	Dr	106	6	15	-	Bedrock	-	-	D	-	Y 6.5.
110	V14-6f	A. Freedman	1956	135	Du-Dr	17.4-242	36-6	17	-	do.	16.47	8-16-57	D	-	Y 4 of bedrock well. Water level measured in dug well.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								BOXFORD (Continued)							
113	V14-6a	R. Knapp	-	150	Du	10.6	30	-	Sand	Ice-contact deposits	9.71	8-16-57	D,N	-	
114	V14-6a	W. Greenler, Jr.	1941	167	Dr	110	6	9.5	-	Bedrock	8.15	8-19-57	D	Pn	Y 7½. C.
115	V14-6a	W. Greenler, Sr.	1925	180	Dr	109	6	-	-	do.	-	-	D	-	Y 9.
116	V14-6a	G. Hopping	-	150	Du	12.9	30	-	-	Ice-contact deposits	11.65	8-19-57	D	-	
117	V14-6b	A. DiPietro	-	150	Du	22.9	36	-	-	Till	22.32	8-19-57	D,N	-	
118	V14-6b	R. Sibley	-	130	Du	14.8	24	-	Gravel	Outwash	12.17	8-19-57	D	-	
119	V14-6b	S. Shappelle	1954	135	Du	22	36	-	Gravel, coarse	Ice-contact deposits	14	8-19-57	D	-	Y 70.
120	V14-6h	J. O'Rourke	-	120	Du	9.6	48	-	-	Outwash	"dry"	8-20-57	D,N	-	Water level below bottom of well on date of measurement.
121	V14-6h	B. Atwood, Sr.	-	123	Du	12.7	40	-	-	do.	11.04	8-20-57	D,N,O	-	
122	V14-6h	R. Shulman	-	125	Du	6.9	30	-	-	do.	"dry"	8-20-57	D,N	-	Water level below bottom of well on date of measurement.
123	V14-6h	J. Noyes	-	130	Du	15.8	36	-	-	Till	14.52	8-20-57	D	-	
124	V14-6h	R. Hamilton	-	126	Du	9.1	30	-	-	do.	8.05	8-20-57	D	-	
125	V14-6g	A. Noyes	-	125	Du	11.3	30	-	-	do.	10.42	8-20-57	D	-	
126	V14-6g	R. Bolton, Jr.	1952	130	Dr	145	6	13	-	Bedrock	-	-	D	-	Y 30.
127	V14-6g	Couch, Galloway, and Schoenthal	-	140	Du	18.3	24	-	-	Till	16.94	8-20-57	D,N	-	
128	V14-5f	W. Anderson	-	152	Du	12.4	32	-	-	do.	10.50	8-20-57	S,N	-	
129	V14-5f	C. Pratt	-	150	Du	26.4	36	-	-	do.	24.67	8-20-57	D	-	
130	V14-5f	H. Dusette	-	150	Du	19.7	36	-	-	do.	16.75	8-20-57	D	-	
131	V14-5f	E. Bemis	1957	156	Dr	120	6	12	-	Bedrock	30	7-10-57	D	-	Y 5.
132	V14-9b	C. Nielsen	-	102	Dr	75	6	-	-	do.	-	-	D	-	Y 3.5.
133	V14-9b	S. Harnis	-	98	Du	4.4	50	4.4	Sand and gravel	Outwash	"dry"	7-31-57	D,N	-	Water level below bottom of well on date of measurement.
134	V14-9b	D. Donnan	-	121	Du	3.5	30	-	-	Till	"dry"	8- 2-57	D,N	-	
136	V14-9b	A. Riggs	-	110	Du	12.3	36	-	-	Outwash	10.55	8- 1-57	D,N	-	
137	V14-9b	do.	-	100	Du	4.0	36	-	-	do.	2.78	8- 1-57	D,N	-	Well reportedly is an improved spring.
138	V14-9b	K. Lynge	-	115	Dr	195	6	-	-	Bedrock	-	-	D	-	Y 6-7.
139	V14-6h	Bishop Sherrill	1955	118	Dn	18	2½	18	Sand and gravel	Outwash	-	-	D	-	
140	V14-9b	B. Perley	-	100	Du	12	-	-	Sand	do.	-	-	D,S	-	C.
141	V14-9c	H. Moore	-	94	Du	13.9	36	-	do.	do.	11.24	8- 2-57	S,N	-	
142	V14-9c	M. Lord	-	100	Du	10.2	45	-	do.	do.	9.55	8- 2-57	S,N	-	
143	V14-9b	J. Baer	-	100	Du	11.9	40	-	-	do.	11.00	8- 5-57	S,N	-	
144	V14-9c	C. Russell	-	100	Du	30	36	-	Gravel	do.	-	-	D,N	-	
145	V14-6j	W. Dorman	-	132	Du	14.7	30	-	Sand and gravel	do.	12.08	8- 6-57	D	-	
146	V14-6j	do.	-	132	Dr	200	6	-	-	Bedrock	-	-	D	-	Y 6-8.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								BOXFORD (Continued)							
148	V14-9a	J. Parkhurst	-	122	Du	11.5	48	-	Clayey sand	Outwash	8.27	8- 7-57	D	-	
149	W14-7a	C. Nelson	-	100	Du	17.7	48	-	Sand and gravel	do.	14.82	8- 8-57	D	-	
151	V14-9c	R. Conner	-	90	Dr	240	6	-	-	Bedrock	-	-	D,S	-	Y 8.
157	V14-6a	R. Hopping	-	182	Du	20.5	50	-	-	Till	16.20	8-15-57	D,S	-	
158	V14-6e	G. Wood	-	130	Du	17.2	40	-	-	Ice-contact deposits	15.24	8-15-57	D,N	-	
160	V14-6f	R. Perley	-	155	Du	10.4	36	-	Clay?	do.	8.93	8-16-57	S	-	Well reportedly can easily be pumped dry.
161	V14-6f	do.	-	160	Du	15.4	40	-	do.	do.	9.26	8-16-57	D,N	-	Do.
162	V14-6f	D. Fahey	-	128	Du	17.5	20	-	-	do.	"dry"	8-16-57	D,N	-	Water level below bottom of well on date of measurement.
164	V14-6a	R. Knapp	-	149	Dn	12	2½	-	Sand	do.	6	8-16-57	D	C	Y 3.
165	V14-6a	W. Greenler, Sr.	1930	181	Du-Dr	22.8-165	36-6	-	-	Bedrock	12.10	8-19-57	S,N	-	Y 18 of drilled well. Water level measured in dug well.
166	V14-6b	A. DiPietro	-	155	Du	24.0	50	-	-	Ice-contact deposits	17.71	8-19-57	D,N	-	
167	V14-6h	J. O'Rourke	-	117	Dn	20	1¼	-	-	Outwash	-	-	D	-	Reportedly never goes dry.
169	V14-6h	B. Atwood, Sr.	-	118	Du	6.9	48	-	-	do.	3.76	8-20-57	D	-	Reportedly never goes dry. Used for watering lawn and gardens.
171	V14-6h	R. Shulman	1951	134	Dr	158	6	6	-	Bedrock	18	-51	D	-	Y 8.
172	V14-5f	W. Anderson	-	158	Du	26.1	50	-	-	Till	22.07	8-20-57	D	-	Well went dry in last week of June 1957 but recovered enough for dom. use by middle of July.
173	W14-7e	E. A. Upton	-	60	Du	12.4	30	-	Sand	Outwash	10.42	7-11-58	N,O	-	
174	W14-7e	do.	-	60	Du	12.4	30	-	do.	do.	8.45	7-11-58	D	-	
175	W14-7e	do.	-	60	Dn	45	1¼	-	do.	do.	10-12	7-11-58	D	-	C.
176	W14-7e	J. Poirier	-	85	Du	15.1	40	-	-	Till	10.69	7-11-58	N	None	T 52.
177	W14-7e	do.	-	80	Du	11.8	-	-	-	Outwash	7.76	7-11-58	N,O	None	T 50.
178	W14-7e	do.	-	85	Dr	185	6	-	-	Bedrock	12	-	D	T	Y 45; dd 40 after 8 hours bailing. T 52. Supplies 2 families.
179	V14-6g	U. S. Geol. Survey	1957	120	A,T	5	4	5R	-	-	-	-	-	-	A. L.
180	V14-9c	do.	1957	100	A,T	2.5	4	2.5R	-	-	-	-	-	-	A. L.
181	W14-4g	do.	1957	110	A,T	5	4	5R	-	-	-	-	-	-	A. L.
182	W14-4g	do.	1957	110	A,T	5	4	5R	-	-	-	-	-	-	A. L.
183	W14-7b	do.	1957	90	A,T	4	4	4R	-	-	-	-	-	-	A. L.
184	W14-7a	do.	1958	135	A,T	24	4	-	-	-	5	10-15-58	-	-	A. L.
185	W14-7d	do.	1958	80	A,T	19	4	19R	-	-	-	-	-	-	A. L.
186	W14-7e	do.	1958	70	A,T	23	4	23R	-	-	9	10-15-58	-	-	A. L.
187	W13-1b	do.	1958	45	A,T	53	4	53R	-	-	14	10-15-58	-	-	A. L.
188	W14-4d	Kelsey-Highlands Nurseries	1918	118	Du	11.6	72	-	Sand and gravel	Outwash	2.02	6-16-59	C	-	T 53. C. Irrigation well.
189	W14-4e	do.	1918	110	Du	12.2	42	-	do.	do.	9.39	6-16-59	D	-	T 49.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								BOXFORD (Continued)							
195	W14-7a	Gerrit Fort	-	85	Du	13.2	36	-	-	Outwash	11.06	7-22-59	D	Pn	T 52.
196	W14-4h	R. H. Parkinson	1954	85	Dn	21	2½	-	Gravel	do.	-	-	D	Pn	T 55.
197	W14-4j	J. S. Perkins	-	95	Du	22.8	36	-	Sand	do.	18.7	7-22-59	D	-	T 50.
198	W14-7a	H. R. Johnson	-	105	Du	21.2	16	-	Gravel	do.	10.99	7-23-59	D	C	T 54.
199	W14-7a	Town of Boxford	-	105	Du	20.9	48	-	-	do.	12.40	7-24-59	PS	H	T 52. Well supplies cemetery.
200	W14-7a	John Marsh	-	100	Du	19.5	48	-	-	Till	11.24	7-24-59	D	Pn	T 53. Well reportedly went "dry" in 1957.
201	W14-7a	C. D. Cahoon	-	120	Du	21.6	24	-	-	Outwash	18.30	7-24-59	D	J	T 52.
202	W14-7a	Clint French	-	100	Du	16.9	40	-	-	do.	9.28	7-27-59	D	-	T 53.
203	V14-9b	A. Peabody	-	115	Dr	-	6	12	-	Bedrock	-	-	-	-	Well not completed on date of inventory 8-4-59.
205	W14-7b	A. A. Shaw	-	120	Dr	250	-	9	-	do.	-	-	D	J	Y 19.5.
206	W14-4h	R. B. Parkhurst	1953	115	Dr	149	6	10	-	do.	8	-53	D	C	Y 12.
207	W14-4h	Z. P. Wilkins	-	110	Dr	158	6	0	-	do.	-	-	-	C	Y 1.5.
208	W14-4h	Dewitt Minich	1955	115	Dr	92	4	-	-	do.	-	-	D	-	Y 10.
209	W14-4h	Cecil Farnsworth	1953	130	Dr	165	6	20	-	do.	-	-	D	J	Y 7.
210	W14-7a	H. E. Trask	1949	100	Dr	92	6	8	-	do.	-	-	D	J	Y 9.
211	W14-4h	Arthur LaPointe	-	90	Dr	76	6	40	-	do.	-	-	D	J	Y 5.
212	W14-7h	K. V. Becker	-	55	Dn	27	3	-	Gravel	Outwash	-	-	D	C	
213	W14-7h	M. S. Holmes	1903	75	Du	20	16 ft.	-	do.	Ice-contact deposits	-	-	D	Pn	
215	W14-4d	W. A. Donovan	-	80	Dr	220	6	40	-	Bedrock	-	-	D	J	Y 3.
216	W14-7h	John Hitchcock	-	90	Du	15.9	36	-	Gravel, sandy	Ice-contact deposits	11.17	8-24-59	D	J	
223	W14-7h	Mass.Dept.Pub.Wks.	1949	58.4	Dn,T	22.2	1	22.2R	-	-	-	-	-	-	A. L.
244	W14-7h	do.	1949	62.5	Dn,T	20.0	1	20.0R	-	-	-	-	-	-	A. L.
251	V14-6e	-	-	150	Dr	-	6	18	-	Bedrock	-	-	-	-	L. Well not completed on date of inventory 9-30-59.
252	V14-6e	-	-	150	Dr	-	6	14	-	do.	-	-	-	-	Do.
								DANVERS							
1	W13-2e	Robert Porter	-	60	Du	19.5	42	-	Sand and gravel	Ice-contact deposits	15.10	6-16-58	D,O	-	C
2	W13-4b	E. Benway	-	125	Du	6.8	30	-	-	Till	3.56	7- 3-58	N	None	T 49.
3	W13-4b	do.	-	125	Du	9.6	36	-	-	do.	6.02	7- 3-58	N	None	T 50.
4	W13-4a	Fedas	1907	140	Du	18.3	40	-	"Sand and gravel"	do.	11.37	7- 2-58	N,O	Pn	T 50.
5	W13-4a	U. S. Geol. Survey	1957	50	A,T	39	4	-	-	-	12.03	10- 1-57	-	-	A. L.
7	W13-2e	do.	1958	35	A,T	40	4	-	-	-	-	-	-	-	A. L.
9	W13-4b	H. Cann	-	140	Du	14.6	48	-	Hardpan	Till	9.80	8-11-59	N	None	
10	W13-4ab	Paul Kasenko	-	100	Du	16.3	24	-	-	do.	8.65	8-11-59	N	None	

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								DANVERS (Continued)							
11	W13-2g	D. P. Rogers	-	100	Du	14	48	-	-	Till	0.86	8-10-59	N	H	T 58.
16	W13-4a	Mass.Dept.Pub.Wks.	1952	43.4	Dn,T	26.7	1	-	-	-	-	-	-	-	A. L.
30	W13-4c	do.	1945	96.8	Dn,T	17.0	-	17.0R	-	-	-	-	-	-	A. L.
146	W13-4b	do.	1947	123.3	Dn,T	11.5	1	11.5R	-	-	-	-	-	-	A. L.
158	W13-1j	do.	1949	79.8	Dn,T	22.2	1	22.2R	-	-	-	-	-	-	A. L.
187	W13-2e	Robert Porter	1959	60	Dr	100	6	99	-	Bedrock	-	-	-	-	A. L.
189	W13-2e	Salem-Beverly Water Board	1952	39	Dn,T	27	2½	-	-	-	-	-	-	-	L.
190	W13-2e	do.	1952	39	Dn,T	47	2½	-	-	-	-	-	-	-	A. L.
194	W13-4a	Town of Danvers	1958	60	Dn	32	2½	-	Sand and gravel	Ice-contact deposits	-	-	T	-	A. L. Y 5.
195	W13-4a	do.	1958	60	Dn	28.5	2½	-	-	-	-	-	T	-	A. L.
								HAMILTON							
27	X13-1a	Town of Hamilton	-	50	Dn	36.0	2½	-	-	Marine unit?	3.88	9-20-57	T,N,O	None	C. Well reportedly flows at times.
28	X13-1c	do.	-	50	GP	26.4	24	-	-	Ice-contact deposits	9.68	9-26-57	PS	T	Y 215; dd 15 after 181 hours pumping. C. T 47.
29	W14-9b	U. S. Geol. Survey	1957	20	A,T	42	4	42R	-	-	-	-	-	-	A. L.
31	X13-1b	G. H. Sprague	1906	35	Dn	50	2	-	-	Marine unit?	+0.25	6-25-58	N,O	None	T 59.
32	X13-1b	Mrs. Sard	-	50	Du	50?	36	-	-	do.	16.29	6-25-58	N	None	
33	X14-7g	Richard Smith	-	50	Du	6.7	36	-	-	Ice-contact deposits	"dry"	6-25-58	N	None	Water level below bottom of well on date of measurement.
34	X14-7g	Mortimer Mirantz	-	50	Du	8	36-48	-	-	do.	"dry"	6-25-58	N	None	Water level below bottom of well on date of measurement. Well reportedly dry throughout much of the year.
35	X14-7g	do.	-	50	Du	8.5	36	-	-	do.	4.37	6-25-58	N,O	None	T 59.
36	X14-7g	do.	1948	60	Dr	150	6	-	-	Bedrock	-	-	D	-	Water reportedly has yellow color.
37	X13-1b	Town of Hamilton	-	40	Du	6.9	30	-	-	Marine unit	1.61	6-25-58	N,O	None	
38	X13-1f	John Horne	1938	55	Du	5.8	36	-	Sand and gravel	Ice-contact deposits	2.96	6-25-58	N,O	None	T 52. Well formerly supplied 3 houses.
40	X13-1c	F. A. Clark	-	70	Du	19.0	36	-	-	do.	9.81	6-25-58	N,O	None	T 48.
41	W14-9j	Asbury Camp Meeting Corp.	1908	60	Du	28.3	48	-	-	Outwash?	19.77	7- 2-58	N,O	None	T 48. Well reportedly never goes dry.
42	W14-9j	do.	1908	50	Du	17.3	72	-	Sand and gravel	do.	10.79	7- 2-58	D	H	T 49.
51	X14-7d	Frederick Winthrop	1957	35	Dn	18-21	2½	-	-	Ice-contact deposits	-	-	D,S	Pn	Y 40. 5 wells in 50 ft. radius.
55	X14-7d	F. R. Appleton	-	55	Du	16.4	36	-	-	do.	12.58	9-29-58	N,O	None	
56	X14-7h	Barrett Wendell	1956	45	Dn	28	2½	-	-	do.	½	9- -56	D	-	L. No dd reported after 48 hours pumping.
57	X14-7f	Margaret Killoran	-	35	Dr	124	-	-	-	Bedrock	-	-	D	J	Y 4½.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								HAMILTON (Continued)							
59	W14-9h	Town of Hamilton	1956	35	Dn	29.5	2½	29.5R	-	-	1.8	2- 1-56	T	-	A. L.
61	W14-9h	do.	1956	40	Dn	60.1	2½	-	Sand, gravel, and clay	Outwash	2.3	2- 3-56	T	-	A. L. Y 17.
69	X14-7g	do.	1956	40	Dn	21.1	2½	21.1R	-	-	-	-	T	-	A. L.
71	X13-2d	do.	1956	50	Dn	75	2½	75R	Sand and gravel	Ice-contact deposits	3.5	2-13-56	T	-	A. L. Y 30.
73	X13-2d	do.	1956	50	Dn	71	2½	71R	do.	do.	0.7	2-18-56	T	-	A. L. Y 45. Water reportedly contains 1.3 ppm of iron.
74	X13-2b	do.	1956	55	Dn	21.8	2½	21.8	-	-	1.3	2-24-56	T	-	A. L.
76	X14-7g	do.	1956	50	Dn	33.0	2½	33.0	-	-	4.5	2-27-56	T	-	A. L.
77	X14-7g	do.	1956	40	Dn	53.8	2½	-	Sand and gravel	Ice-contact deposits	-	-	T	-	L. Y 75; dd 0. Well flowed at 4 gpm.
80	W14-9e	do.	1956	50	Dn	46.0	2½	-	do.	Outwash	0.1	3- 6-56	T	-	A. L. Y 65; dd 8 after 4 hours pumping.
81	W14-9e	do.	1956	50	Dn	56.5	2½	-	-	-	0.5	3-12-56	T	-	A. L. Well could not be pumped.
82	W14-9e	do.	1956	50	Dn	52.0	2½	52.0R	Sand, clay, and gravel	Outwash	0.3	3- -56	T	-	A. L. Y 15.
83	W14-9f	do.	1956	40	Dn	17	2½	17R	-	-	0.0	4- 7-56	T	-	A. L.
84	W14-9h	do.	1956	35	Dn	40.0	2½	40.0R	Sand and gravel	Outwash	0.2	4- 9-56	T	-	A. L. A second test well at this location had a yield of 63 gpm, dd 4.2 after 3 hours pumping.
88	W14-9h	do.	1956	40	Dn	70.5	2½	70.5R	-	-	0.2	5-10-56	T	-	A. L. Well could not be pumped.
89	W14-9h	do.	1956	40	Dn	13	2½	13R	-	-	0.3	4-14-56	T	-	A. L.
91	W14-9h	do.	1956	40	Dn	49.5	2½	49.5R	Sand and gravel	Ice-contact deposits	0.4	4- -56	T	-	L. Y 75; dd 7.2 after 3 hours pumping.
93	W14-9h	do.	1956	40	Dn	20.1	2½	20.1R	-	-	0.5	4-20-56	T	-	A. L.
94	W14-9h	do.	1956	40	Dn	27.8	2½	27.8R	-	-	2.8	4-20-56	T	-	A. L.
95	W14-9h	do.	1956	40	Dn	56.9	2½	-	Sand, gravel, and clay	Outwash	0.5	4-21-56	T	-	A. L.
100	W14-9h	do.	1956	40	Dn	55.3	2½	55.3R	-	-	0.0	4-28-56	T	-	A. L.
102	W14-9h	do.	1956	40	Dn	41.1	2½	-	Sand and gravel	Ice-contact deposits	-	-	T	-	L. Y 78; dd 8.8 after 1 hour of pumping. Well reportedly flowed.
109	W14-9h	do.	1956	40	Dn	53.5	2½	53.5R	do.	do.	5.2	5-29-56	T	-	L. Y 35.
112	W14-9a	U. S. Geol. Survey	1957	50	A,T	5	4	5R	-	-	-	-	-	-	A. L.
113	W13-3c	do.	1957	65	A,T	5.5	4	5.5R	-	-	-	-	-	-	A. L.
114	X13-1b	do.	1957	40	A,T	38	4	38R	-	-	-	-	-	-	A. L.
115	X14-7g	do.	1958	65	A,T	6	4	6R	-	-	-	-	-	-	A. L.
116	X14-7g	do.	1958	45	A,T	16	4	16R	-	-	-	-	-	-	A. L.
117	X14-7d	do.	1958	40	A,T	21	4	21R	-	-	-	-	-	-	A. L.
118	W14-9h	Town of Hamilton	1958	40	GP	35	48	-	-	Ice-contact deposits?	-	-	PS	T	Y at least capacity of pump: 225 gpm. C.
119	X13-1b	Mary Curtis	1921	50	Dn	65	2½	-	Sand	Marine unit?	9.67	5-14-59	N	None	Y 100.
120	X13-1b	Esther Proctor	-	60	Dn	22.3	2½	-	-	Ice-contact deposits	11.69	5-14-59	D	Pn	T 48.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								HAMILTON (Continued)							
121	X13-1b	H. S. Middendorf	-	50	Du	24.0	26	-	-	Marine unit	14.40	5-14-59	D	Pn	Reportedly has never gone dry.
122	X13-1c	do.	-	40	Du	6.0	72	-	-	do.	2.70	5-14-59	D	None	T 48.
123	X13-1c	do.	-	25	Dn	-	2½	-	-	Marine unit?	-	-	D,S	Pn,C	6 driven wells supply home, greenhouse, gardens, and stable.
124	X13-1d	Myopia Hunt Club	1930	35	Du	15.8	11 ft.	-	Sand and gravel	do.	6.10	5-14-59	PS	C	Supplies large country club.
125	X13-2a	John Frongello	-	80	Du	16.1	30	-	Gravel	Ice-contact deposits	14.10	6-12-59	N	None	
126	X14-7f	H. A. Laughlin	-	30	Du	22.3	48	-	Sand and gravel	do.	5.00	7- 7-59	D	Pn	Supplies several families.
127	X13-1e	P. B. Weld	-	75	Du	24.2	96	-	Sand	do.	17.85	6-23-59	D	Pn	Reportedly goes dry in summer if pumped.
129	X13-1b	U. S. Geol. Survey	1959	35	A,T	49	4	-	-	-	-	-	-	-	A. L.
130	X13-1f	do.	1959	60	A,T	9	4	9R	-	-	-	-	-	-	A. L.
131	X13-1c	do.	1959	80	A,T	6	4	6R	-	-	-	-	-	-	A. L.
132	X13-1c	do.	1959	60	A,T	27	4	27R	-	-	-	-	-	-	A. L.
133	X13-1c	do.	1959	60	A,T	40	4	40R	-	-	-	-	-	-	A. L.
134	X13-1c	do.	1959	75	A,T	4	4	4R	-	-	-	-	-	-	A. L.
135	X13-1a	do.	1959	45	A,T	33	4	33R	-	-	-	-	-	-	A. L.
136	X13-1a	do.	1959	45	A,T	60	4	60R	-	-	-	-	-	-	A. L.
137	X13-1a	do.	1959	35	A,T	63	4	63R	-	-	-	-	-	-	A. L.
138	X13-1c	Town of Hamilton	1940-	18-	Dn	21-	2½,	-	Sand and gravel	Ice-contact deposits?	-	-	PS	T	31 tubular and 2 gravel-packed wells pumped on suction line.
170			1948	21		49	60								
171	X13-1c	do.	1958	45	Dn	22	2½	-	-	-	-	-	T	-	A. L.
172	X13-1f	do.	1958	50	Dn	56.5	2½	-	Sand and gravel	Ice-contact deposits	-	-	T	-	A. L. Y 38.
175	X13-1c	do.	1958	30	Dn	35.5	2½	-	-	-	-	-	T	-	A. L.
177	X13-1c	do.	1958	30	Dn	31	2½	-	-	-	-	-	T	-	A. L.
178	X13-2a	do.	1958	80	Dn	10.5	2½	-	-	-	-	-	T	-	A. L.
180	X13-1c	do.	1958	55	Dn	24	2½	-	-	-	-	-	T	-	A. L.
182	W13-3b	do.	1958	40	Dn	43	2½	-	Sand and gravel	Outwash and ice-contact deposits, undifferentiated	2	11-20-58	T	-	A. L. Y 55.
183	W13.3b	do.	1959	35	Dn	41.7	2½	41.7R	do.	do.	3.5	8- 1-59	T	-	L. "Pumped freely" at depth of 27.5 feet.
184	W13-3b	do.	1959	35	Dn	65.5	2½	-	do.	do.	0.4	8- 4-59	T	-	L. Y 60; dd 0.7 after 7 hours pumping.
185	W13-3b	do.	1959	35	Dn	48	2½	48R	do.	do.	0.3	8- 7-59	T	-	L. Y 25.
186	X13-1c	do.	1915	25	Dn	20-	-	-	do.	Ice-contact deposits	-	-	T	-	L. Y 20-40.
204						53									

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								IPSWICH							
1	W14-6e	Joseph Thomas	-	85	Du	17.3	36	-	-	Ice-contact deposits	15.92	9-12-58	N	None	T 56.
2	W14-9a	Mass. Dept. Cons.	-	60	Du	12.2	48	-	Gravel	do.	11.58	10-15-47	N,O	None	
7	X14-7c	F. R. Appleton	-	40	Du	8.0	36	-	Sand and gravel	do.	4.88	6-16-58	N	None	
8	X14-7c	do.	-	35	Du	12.9	36	-	do.	do.	11.63	6-16-58	N	None	
9	W14-6h	U. S. Geol. Survey	1957	50	A,T	48	4	48R	-	-	-	-	-	-	A. L.
10	X14-8a	do.	1957	30	A,T	24	4	-	-	-	-	-	-	-	A. L.
11	X14-8a	do.	1957	50	A,T	38	4	38R	-	-	-	-	-	-	A. L.
14	W14-9b	Thiebault	1880	60	Du	13.1	36	-	-	Till	4.89	7- 2-58	D,S,O	None	T 50.
16	X14-7b	Lloyd Ricker	1954	45	Dr	20.6	4	-	-	Bedrock	10.1	7-24-58	D	C	Y 16; dd 3.2 feet after 10 minutes pumping. T 48.
17	X14-4g	Ernest LeBel	1957	55	Du	9.7	24	-	-	Ice-contact deposits	5.20	7-24-58	N	None	Water reportedly unfit for stock.
18	X14-4g	Simon Kamon	-	45	Du	5.4	24	-	-	Marine unit	0.0	7-24-58	D,S	T	T 54. Reportedly goes dry occasionally.
19	X14-4g	Walter Ellsworth	1850	100	Du	31.4	30	-	-	Till	5.17	7-24-58	N,O	None	Has never gone dry.
20	X14-8b	Mrs. John Glessner	-	30	Du	25.3	30	-	-	Ice-contact deposits	12.51	7-28-58	N,O	None	T 51.
21	X14-5j	K. S. Thompson	-	15	Du	11.9	30	-	Gravel	do.	7.39	7-28-58	N,O	None	T 54.
22	X14-8a	Neil Raymond	1953	35	Dr	190	-	30	-	Bedrock	-	-	D,S	J	Y 20.
24	X14-7c	Parsons Bros. Dairy	-	35	Du	5.9	48	-	-	Marine unit	3.63	7-28-58	N	None	T 54.
25	X14-8a	Hazel Lane	-	40	Du	6.4	30	-	-	do.	5.18	7-28-58	N	None	
28	X14-5d	T. I. Gregory, Jr.	-	25	Du	12.7	30	-	-	do.	7.68	8-13-58	N	None	
29	X14-5e	H. G. Nichols, Jr.	1920	15	Du	11.6	36	-	-	Ice-contact deposits	8.50	8-13-58	D	Pn	
30	X14-5g	Felix Stankus	1949	50	Du	15.4	30	-	-	Till	2.96	8-13-58	D	None	T 62. Used only for domestic garden irrigation.
32	X14-5g	do.	-	50	Du	14.1	30	-	-	do.	5.85	8-13-58	N	None	T 61.
34	X14-5g	J. C. Murphy	-	55	Du	11.1	30	-	-	do.	6.90	8-13-58	D	-	T 59.
35	X14-5g	M. B. Phillips	-	70	Du	16.9	30	-	-	do.	8.23	8-13-58	N	None	T 54.
36	X14-5g	do.	-	40	Du	11.0	36	-	-	Marine unit	5.64	8-13-58	N	None	T 52.
37	X14-5g	do.	-	40	Du	17.7	36	-	-	Till	12.02	8-13-58	N	None	T 53.
38	X14-5j	R. G. Vickery	-	50	Du	20.4	36	-	-	do.	15.22	8-13-58	D	-	T 52.
39	X14-8c	Kenneth MacLeod	-	20	Du	17.1	36	-	-	Marine unit	8.15	8-13-58	N	None	T 54.
40	X14-5d	-	-	105	Du	17.4	72	-	-	Till	6.32	8-14-58	N	None	
41	X14-5e	James S. Price	1957	20	Dn	36	2½	36R	"Blue bedrock"	-	10	5- -58	D	Pn	L. Y 6. Used only for domestic garden irrigation.
42	X14-4g	E. and H. Michaud	-	55	Du	9.1	30	-	-	Ice-contact deposits	4.40	8-19-58	D	C	
43	X14-4g	Ernest LeBel	1948	75	Du	13.3	30	13	"Broken bedrock"	Bedrock	10.35	8-19-58	D	H	L.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
									ESSEX COUNTY (Continued)						
									IPSWICH (Continued)						
46	X14-6d	Castle Hill Farm	-	135	Du	23.1	30	-	-	Till	15.49	8-25-58	N	None	
47	X14-6h	C. S. Burwell	-	40	Dn	46	2½	-	Sand and gravel	Ice-contact deposits	33.70	8-25-58	N	None	L. Water reportedly is "brackish".
49	X14-5h	Serge Belosellsky	-	35	Du	23.1	36	-	do.	Ice-contact deposits?	15.99	8-26-58	N	None	
50	X14-5h	do.	-	15	Du	18.8	12 ft.	-	do.	do.	7.18	8-26-58	D	Pn	Never goes dry.
51	W14-5f	Mrs. Raymond Douglas	-	70	Dr	32.4	6	-	-	Bedrock?	5.27	9-11-58	C	Pn	Serves tourist court.
52	W14-5f	do.	-	70	Du	10.2	24	-	-	Outwash	5.74	9-11-58	N	None	T 62.
54	W14-6d	K. F. Hein	1934	70	Dr	157	6	18?	-	Bedrock	6	9- -58	C	T	C. Serves tourist court.
55	W14-6d	Rowland Gooch	-	95	Du	16.3	36	-	-	Till	14.70	9-11-58	N	None	
56	W14-6d	Alice Conant	-	90	Du	7.6	36	-	-	Ice-contact deposits	"dry"	9-12-58	N	None	Water level below bottom of well on date of measurement.
57	W14-6d	Willowdale State Forest	-	80	Du	15.6	36	-	-	do.	12.89	9-12-58	N	None	T 54.
58	X14-7b	C. S. Bird	-	35	Du	11.9	36	-	-	Marine unit?	9.97	9- 4-58	N	None	
60	X14-6g	F. B. Jennings	1933	10	Dn	25	2½	-	-	Ice-contact deposits	-	-	N	None	L. Water reportedly is "brackish".
61	W14-5f	R. Bousley	-	110	Du	14.2	24	-	-	Till	12.43	9- 5-58	D	Pn	Well reportedly has gone dry occasionally.
62	W14-5f	do.	-	95	Du	4.1	18	-	"Sand"	do.	2.48	9- 5-58	D	-	Well used for domestic irrigation.
63	W14-5f	Alfred Blair	-	120	Du	-	36	-	-	Ice-contact deposits	13.10	9-15-58	D	Pn	Well never goes dry.
64	W14-5f	Harold Barton	1946	90	Du	12.8	24	-	-	Till	10.63	9-15-58	D	Pn	T 57.
65	X14-8b	Kenneth MacLeod	-	15	Du	12.0	48	-	-	Marine unit	1.43	9-19-58	N	None	
66	X14-5d	Mrs. Richard Sears	-	15	Du	12.6	72	-	Sand and gravel	Ice-contact deposits	6.41	9-25-58	N	None	Well never went dry when used.
67	X14-8d	Neil Stewart	-	45	Du	16.7	36	-	-	Marine unit	6.24	9-26-58	N	None	T 57.
68	W14-5j	F. Caloggro	1950	70	Du	10.0	48	-	"Sand and gravel"	Till?	6.68	9-19-58	D,S	Pn	Well has never gone dry.
69	W14-5j	do.	-	80	Du	14.7	24	-	-	do.	13.98	9- 5-58	D,S	Pn	Well reportedly goes dry occasionally.
71	W14-5j	-	-	90	Du	19.8	36	-	-	Ice-contact deposits	18.37	9-18-58	N	None	
72	W14-5j	Elna Sexton	-	75	Du	10.0	18	-	-	Till	"dry"	9-18-58	D	H	Water level below bottom of well on date of measurement.
73	W14-5f	Katherine Irby	-	85	Du	25.3	24	-	-	Ice-contact deposits	15.58	9-18-58	N	None	T 54.
74	W14-5f	S. H. Perley	-	85	Du	24.5	36	-	-	do.	10.56	9-22-58	N	None	
78	W14-5h	R. M. Norwood	-	85	Du	19.6	36	-	-	do.	17.84	9-22-58	D	-	T 52. Well reportedly goes dry in summer.
79	W14-5e	R. K. Leavitt	-	100	Du	16.7	48	-	-	Till	15.19	9-26-58	D	J	T 54. Well reportedly has never gone dry.
80	W14-5d	do.	-	85	Du	5.3	60	-	-	do.	3.08	9-26-58	N	None	

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year com-pleted	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								IPSWICH (Continued)							
81	W14-5h	R. A. Heard	1910	80	Du	6.0	36	-	-	Ice-contact deposits	3.82	9-26-58	D,S	-	Well reportedly goes dry occasionally.
82	W14-5h	Mrs. A. Pitcairn	-	75	Du	19.3	24	-	-	do.	17.08	9-25-58	D	Pn	Y 7. T 54.
83	W14-5h	William Hennessy	-	85	Du	19.6	36	-	-	do.	17.28	9-25-58	D	Pn	Y 4.
86	W14-5h	R. A. Heard	1935	75	Dr	65	6	18	-	Bedrock	15	9- -58	D	T	Y 2½.
88	W14-5g	Jesse Hey	-	75	Dn	16.4	2	-	-	Outwash	12.47	9-26-58	D	H	
89	X14-5g	Rollin Kelley	1935	50	Du	12.3	24	-	-	Till	2.98	11- 5-58	D	None	T 53.
90	X14-8a	A. C. Burrage	1934	25	Dn	25.5	2½	-	-	Marine unit	1.83	11- 6-58	N	None	Well found inadequate for large supplies.
91	X14-8a	do.	1934	25	Dn	24.0	3	-	-	do.	2.24	11- 6-58	N	None	
92	X14-8a	do.	-	45	Du	21.7	36	-	-	do.	19.25	11- 6-58	N	None	T 52.
96	X14-4j	Town of Ipswich	1957	8	Dn,T	22	2½	22R	-	-	-	-	-	-	A. L.
97	X14-5d	do.	1957	8.5	Dn,T	9.0	2½	-	-	-	-	-	-	-	A. L.
99	X14-5d	do.	1957	9	Dn,T	8.5	2½	8.5R	-	-	-	-	-	-	A. L.
102	X14-5d	do.	1957	25	Dn,T	5	2½	5R	-	-	-	-	-	-	A. L.
103	X14-5d	do.	1957	13	Dn,T	8.0	2½	8.0R	-	-	-	-	-	-	A. L.
109	X14-5d	do.	1957	0.0	Dn,T	28	2½	28R	-	-	-	-	-	-	A. L.
112	X14-4j	do.	1957	9	Dn,T	17	2½	-	-	-	-	-	-	-	A. L.
113	X14-4f	do.	1957	43	Dn,T	61	2½	-	-	-	-	-	-	-	A. L.
119	X14-4j	do.	1893	20	Dn	35	2½	-	Gravel	Ice-contact deposits	-	-	T	-	A. L. Y 60.
123	X14-4h	do.	1893	25	Dn	18.5	2½	18.5	"Fine blue quicksand"	do.	-	-	T	-	A. L. Y 30.
126	X14-4h	do.	1893	35	Dn	30	2½	30	-	-	-	-	T	-	A. L.
129	X14-4j	do.	1893	30	Dn	33	2½	-	Ice-contact deposits	-	-	-	T	-	A. L. Y 50.
131	X14-7c	do.	1893	20	Dn	20	2½	-	-	-	-	-	T	-	A. L.
132	X14-7c	do.	1893	20	Dn	33	2½	-	-	-	-	-	T	-	A. L. No water could be pumped.
133	X14-7c	do.	1893	20	Dn	30	2½	-	-	-	-	-	T	-	A. L.
157	X14-4j	do.	1954	20	Dn	54	2½	54R	Sand, gravel, and clay	Ice-contact deposits	-	-	T	-	A. L. Y 39; dd 11. Water reportedly contained 0.15 ppm of iron and 0.00 ppm of manganese.
159	X14-4j	do.	1954	20	Dn	53.4	2½	53.4R	-	-	-	-	T	-	A. L. Formation reportedly "tight".
160	X14-4j	do.	1954	20	Dn	30.7	2½	30.7R	Sand, gravel, and clay	Ice-contact deposits	-	-	T	-	A. L. Y 20.
163	X14-4h	do.	1954	35	Dn	42	2½	42R	-	-	-	-	T	-	A. L.
164	X14-4h	do.	1954	20	Dn	31	2½	31R	-	-	-	-	T	-	A. L. No water could be pumped.
165	X14-7b	do.	1954	20	Dn	53	2½	53R	-	-	-	-	T	-	A. L.
166	X14-4h	do.	1954	30	Dn	25.5	2½	25.5R	Sand and clay	Marine unit and ice-contact deposits undifferentiated	-	-	T	-	A. L. Well reportedly "pumped fair" with hand pump.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								IPSWICH (Continued)							
168	X14-7c	Town of Ipswich	1954	20	Dn	12.1	2½	12.1R	-	-	-	-	T	-	A. L.
169	X14-7c	do.	1954	20	Dn	28.1	2½	28.1R	-	-	-	-	T	-	A. L. Well reportedly could not be pumped.
170	X14-7c	do.	1954	20	Dn	33.3	2½	33.3R	Gravel, sand, and clay	Ice-contact deposits	-	-	T	-	A. L. Well reportedly "pumped but tight".
174	X14-7f	do.	1954	20	Dn	35.3	2½	35.3R	-	-	-	-	T	-	A. L. Well could not be pumped.
175	X14-7f	do.	1954	20	Dn	25.0	2½	25.0R	-	-	-	-	T	-	Do.
176	X14-7a	do.	1954	25	Dn	42.1	2½	42.1R	-	-	-	-	T	-	A. L.
179	W14-9b	do.	1954	20	Dn	40.8	2½	40.8R	-	-	-	-	T	-	A. L.
180	W14-9c	do.	1954	20	Dn	22.5	2½	22.5R	-	-	-	-	T	-	A. L.
181	W14-9c	do.	1954	25	Dn	56.8	2½	56.8R	Gravel, sand, and clay	Outwash	+1.25	-54	T	-	A. L. Y 55; dd 5.7 after 7 hours pumping. Water reportedly contained 0.10 ppm of iron and 0.00 ppm of manganese.
183	X14-7b	do.	1954	15	Dn	56.2	2½	56.2R	-	-	-	-	T	-	A. L.
188	W14-9c	do.	1954	20	Dn	31.5	2½	31.5R	Sand and "stones"	Outwash	-	-	T	-	A. L. Y 10.
189	X14-8d	do.	1954	25	Dn	65.3	2½	65.3R	-	-	-	-	T	-	A. L.
190	X14-8d	do.	1954	30	Dn	58.1	2½	58.1R	Gravel, sand, and clay	Marine unit?	-	-	T	-	A. L. Y 25. Well reportedly "wouldn't clear".
192	W14-5j	do.	1954	60	Dn	45.2	2½	45.2R	Gravel and clay	Ice-contact deposits	-	-	T	-	A. L. Y 24. Well reportedly "wouldn't clear".
194	W14-5h	do.	1954	80	Dn	70.0	2½	70.0R	-	-	-	-	T	-	A. L. Well reportedly could not be pumped.
197	W14-5j	do.	1954	70	Dn	71.2	2½	71.2R	Gravel and clay	Ice-contact deposits	-	-	T	-	A. L. Y 30. Water reportedly contained 0.13 ppm of iron and 0.04 ppm of manganese.
201	W14-5g	do.	1954	70	Dn	31.8	2½	31.8R?	Gravel and fine sand	do.	-	-	T	-	A. L. Y 55. Water reportedly contained 6.4 ppm of iron and 0.42 ppm of manganese.
218	X14-4j	First National Bank, Ipswich	1950	15	Dn	21	-	-	-	-	-	-	-	-	A. L.
235	X14-4e	Boston & Maine R. R.	1931	45	Dn	60	-	-	-	-	1.2	5-31	-	-	A. L.
239	X14-5d	-	1957	5	Dn	29.0	2	29.0R	-	-	-	-	-	-	A. L.
272	X14-4j	Town of Ipswich	1949	21.5	Dn,T	14.5	1	-	-	-	-	-	-	-	A. L.
276	X14-4j	do.	1949	26	Dn,T	24.0	1	24.0R	-	-	8.0	1-49	-	-	A. L.
279	X14-5g	do.	1949	27	Dn,T	7.5	1	7.5R	-	-	-	-	-	-	A. L.
285	X14-4f	do.	1949	23	Dn,T	14.0	1	-	-	-	-	-	-	-	A. L.
287	X14-4f	do.	1949	27	Dn,T	10.0	1	-	-	-	3.5	1-49	-	-	A. L.
288	X14-4j	do.	1949	28	Dn,T	21.0	1	-	-	-	5.0	1-49	-	-	A. L.
289	X14-5b	do.	1949	17	Dn,T	20.0	1	-	-	-	-	-	-	-	A. L.
290	W14-5j	U. S. Geol. Survey	1957	80	A,T	33	4	33R	-	-	.9	10-11-58	-	-	A. L.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								IPSWICH (Continued)							
293	X14-5b	U. S. Geol. Survey	1957	20	A,T	31	4	31R	-	-	-	-	-	-	A. L.
294	X14-5b	do.	1957	10	A,T	11	4	11R	-	-	-	-	-	-	A. L.
295	X14-8a	do.	1957	50	A,T	9	4	9R	-	-	-	-	-	-	A. L.
296	X14-5j	do.	1957	30	A,T	13	4	13R	-	-	-	-	-	-	A. L.
297	X14-6g	do.	1957	30	A,T	5	4	5R	-	-	-	-	-	-	A. L.
299	X14-5c	do.	1958	30	A,T	27	4	27R	-	-	-	-	-	-	A. L.
301	X14-5a	do.	1958	9	A,T	16	4	16	-	-	-	-	-	-	A. L.
303	X14-5a	do.	1958	5	A,T	77	4	77R	-	-	-	-	-	-	A. L.
304	X14-5b	do.	1958	20	A,T	42	4	42R	-	-	-	-	-	-	A. L.
307	X14-5d	do.	1958	30	A,T	28	4	28R	-	-	-	-	-	-	A. L.
308	X14-5d	do.	1958	30	A,T	5	4	5R	-	-	-	-	-	-	A. L.
314	X14-5j	do.	1958	6	A,T	35	4	35R	-	-	-	-	-	-	A. L.
319	X14-8a	do.	1958	40	A,T	23	4	23R	-	-	-	-	-	-	A. L.
321	X14-7c	Mass.Dept.Pub.Wks.	1951	15	Dn,T	11.0	2½	11.0R	-	-	-	-	-	-	A. L.
322	X14-7c	do.	1951	15	Dn,T	11.5	2½	11.5R	-	-	-	-	-	-	A. L.
331	X14-5j	Katherine Thompson	1946	5	Dn	21.3	1	-	Gravel	Marine unit?	0.8	9-15-60	N	None	C.
								MIDDLETON							
3	V13-6b	G. E. Sanders	1952	125	Dr	132	46	-	-	Bedrock	34?	-52	D	J	Y ½. C.
11	V13-2c	J. Storrow	-	115	Du	12.8	36	-	-	Till	11.75	7-23-57	D,N	-	
12	V13-2c	do.	-	115	Du	20.5	50	-	-	do.	15.52	7-23-57	D	-	
14	V14-8j	T. Dolan	-	90	Dn	27	2	-	"Red sand"	Outwash	18	7-26-57	D	-	
15	V14-9g	H. Richardson	-	90	Du	12.9	24	-	Sand	do.	11.52	7-24-57	D,N	-	
16	V14-8j	B. Hurd	1955	110	Dr	136	6	11	-	Bedrock	-	-	D	-	Y 6-8.
18	W13-1a	John Hoctor	-	45	Du	15.5	30	-	Sand and clay	Outwash	4.80	7- 3-58	D,O	Pn	
20	W13-1a	Rubchinuk	1928	35	Du	5.6	72	-	do.	do.	3.30	7- 3-58	N	-	T 52.
21	V13-6c	Middleton Greenhouses	-	50	Du	-	60	-	Sand	do.	5.38	7- 3-58	C	-	T 50. Used for irrigation.
26	V13-3e	Sullivan	1952	85	Dr	86	-	14	-	Bedrock	-	-	D	-	Y 3.
28	V13-3a	D. Dixey	-	80	Du	8.1	24	-	-	Till	2.18	7-10-58	D	-	
31	V13-3a	Edward Wright	-	85	Du	6.5	36	-	-	do.	4.06	7-10-58	D	Pn	
35	V13-3a	Stoddard	-	90	Du	15.9	30	-	-	Outwash	11.80	7-10-58	N	None	
36	V13-3a	do.	-	85	Du	13.6	30	-	-	Till	9.41	7-10-58	N,O	None	
46	V13-3b	E. E. Coffin	-	90	Du	15.2	48	-	Sand, silt, clay	do.	11.6	7-10-58	N	None	
47	V13-3b	do.	-	75	Du	6.5	24	-	Sand	Outwash	3.45	7-10-58	D	-	
49	V13-3b	LeColst	-	85	Du	13.9	48	-	-	Till	7.45	7-10-58	D	Pn	
51	V13-3d	Herbert Currier	-	85	Du	18.0	36	-	-	do.	12.15	7-10-58	N	None	
52	V13-3d	do.	-	75	Du	9.3	30	-	-	do.	4.00	7-11-58	D	-	T 59.
53	V13-3d	do.	-	85	Du	15.4	36	-	-	do.	9.98	7-11-58	N	None	T 49.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								MIDDLETON (Continued)							
55	V13-3f	Roger Wallace	-	80	Du	9.6	36	-	-	Outwash	5.45	7-11-58	N,O	T	T 55. Water reportedly "polluted"--"unfit for drinking".
58	V13-6f	U. S. Geol. Survey	1958	55	A,T	17.5	4	17.5R	-	-	-	-	-	-	A. L.
59	V13-6c	do.	1958	75	A,T	6	4	6R	-	-	-	-	-	-	A. L.
60	W13-4a	do.	1957	50	A,T	83	4	83.0R	-	-	-	-	-	-	A. L.
61	W13-4a	do.	1957	50	A,T	11	4	11R	-	-	-	-	-	-	A. L.
62	W13-4a	do.	1957	50	A,T	32	4	32R	-	-	-	-	-	-	A. L.
63	W13-4a	do.	1957	50	A,T	71	4	-	-	-	-	-	-	-	A. L.
64	W13-1a	do.	1957	50	A,T	36	4	36R	-	-	-	-	-	-	A. L.
65	W13-1a	do.	1957	40	A,T	63	4	63R	-	-	-	-	-	-	A. L.
66	V13-3h	Warren Pope	-	110	Du	12.2	30	-	-	Till	8.80	8- 4-59	N	H	T 55.
67	V13-6c	R. White	-	115	Du	17.6	36	-	-	do.	12.58	8- 4-59	N	None	T 49.
68	V13-6c	Leopold Blais	-	100	Du	21.7	60	-	Gravel, poorly sorted	Ice-contact deposits	14.90	8- 4-59	N	None	T 53.
69	V13-6b	Russel Rollins	1950	140	Du	15.1	-	-	-	Till	6.77	8- 4-59	D	Pn	T 55. Reportedly went "dry" in 1957.
70	V13-3j	P. H. Richardson	-	85	Du	17.0	36	-	-	Ice-contact deposits	12.80	8- 4-59	N	None	T 55.
71	V13-3c	Curtis	-	60	Du	22.8	24	22.8	"Gravel"	Till	16.45	8- 5-59	S	H	T 47.
72	V13-3c	H. G. Whitmore	-	80	Du	13.6	36	-	do.	do.	8.78	8- 6-59	D	C	T 52.
73	V13-3j	Peter Johnson	-	90	Du	7.4	-	-	-	Ice-contact deposits	2.93	8- 6-59	N	None	T 58.
74	W13-1h	M. J. Masi	-	110	Du	27.1	84	-	Hardpan	Till	17.58	8-11-59	D	Pn	
75	W13-1d	Max Weber	-	125	Du	10.8	20	-	-	do.	3.01	8-11-59	N	None	
76	W13-1d	R. H. Illingworth	-	90	Du	19.1	36	-	"Sand and gravel"	do.	7.46	8-11-59	N	H	
77	W13-1d	Gordon Sherman	-	80	Du	17.1	30	-	-	do.	9.38	8-12-59	N	None	
78	W13-1e	Mary Magee	1930	50	Dn	20-30	2	-	Gravel	Ice-contact deposits	-	-	D,S	J	Y 20.
86	U13-3c	Mass.Dept.Pub.Wks.	1955	32.0	Dn,T	22.5	2½	32R	-	-	-	-	-	-	A. L.
87	W13-1b	do.	1949	33.2	Dn,T	21.2	2½	21.2R	-	-	-	-	-	-	A. L.
91	V13-8j	U. S. Geol. Survey	1959	110	A,T	43	4	43R	-	-	-	-	-	-	A. L.
95	W13-1g	Town of Danvers	1958	50	Dn	54	2½	-	Sand and gravel	Ice-contact deposits	-	-	T	-	A. L. Y 37.
101	W13-1g	do.	1958	45	Dn	63½	2½	-	Sand	Outwash	-	-	T	-	A. L. Y 50.
107	W13-1g	do.	1958	50	Dn	21.3	2½	21.3R	-	-	-	-	T	-	A. L.
108	W13-4a	do.	1958	45	Dn	58.7	2½	57.5R	Gravel, sand, and some clay	Ice-contact deposits	-	-	T	-	A. L. Y 60.
114	W13-1g	do.	1958	50	Dn	43.3	2½	-	Coarse sand and gravel	Outwash	-	-	T	-	A. L. Y 30.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								MIDDLETON (Continued)							
116	V13-3j	Town of Danvers	1958	50	Dn	59.0	2½	59.0R	Sand and gravel	Outwash	-	-	T	-	A. L. Y 50.
119	W13-1g	do.	1958	50	Dn	78.8	2½	78.8R	Clay, sand, and gravel	Ice-contact deposits	-	-	T	-	A. L. Y 22.
120	V14-8j	T. Dolan	-	90	Du	13.2	30	-	Sand	Outwash	12.8	7-26-57	D	None	
122	W13-4a	Town of Danvers	1960	45	GP	35	8	-	Sand and gravel	Ice-contact deposits	-	-	PS	T	Y 600. C.
								NORTH ANDOVER							
2	V14-7b	Gilbert Rea	-	245	Du	8.7	30	-	-	Till	6.82	7- 1-57	D,S,N	None	
4	V14-4h	Greenwood	-	385	Du	35.9	36	-	-	do.	13.91	7- 1-57	D	-	T 54.
9	V14-7b	Irene Reynolds	-	205	Du	6.3	36	-	-	do.	"dry"	7- 1-57	D,N	-	Water level below bottom of well on date of measurement.
10	V14-4h	Stephen	-	220	Du	9.0	30	-	-	do.	8.33	7- 1-57	N	-	
11	V14-4j	Walter Krorski	1957	170	Du	9.7	40	-	-	do.	7.69	7- 1-57	D	-	T 55.
12	V14-7c	J. Mandry	-	190	Du	18.0	65	-	-	do.	7.95	7- 1-57	D	-	
13	V14-7c	-	-	210	Du	8.5	50	-	-	do.	5.49	7-17-57	-	-	
14	V14-7c	Walter Kozdras	1947	200	Du- Dr	12.4- 100.3	30- 6	-	-	Till-Bedrock	9.56- 13.26	7- 1-57	D	-	
15	V14-7c	L. Lowell	1941	195	Du	18.6	48	-	-	Till	9.10	7- 2-57	D	-	T 53.
16	V14-4j	John Kozdras	1947	160	Du- Dr	28.4- 72.0	30- 6	-	-	Till-Bedrock	18.50	7- 1-57	D,S	-	T 53. Water level probably represents combined pressures in till and bedrock.
17	V14-4j	Mrs. Frank Ohms	-	170	Du	17.9	36	-	-	Till	9.98	7- 2-57	S,N	-	T 52. Well reportedly went "dry" in 1953.
18	V14-4j	Sargent Winning	-	205	Du	23.8	36	-	-	do.	12.55	7- 2-57	D,N	-	
19	V14-4j	Charles Peter	-	195	Du	21.7	48	-	-	do.	15.17	7- 2-57	D,S,N	None	T 52.
21	V14-4h	Charles Wilcox	-	190	Du	11.3	36	-	-	do.	6.37	7- 2-57	D,N	-	T 57.
23	V14-4f	R. A. Smith	-	185	Du	14.2	36	-	-	do.	11.65	7- 2-57	D,N,O	None	
24	V14-4f	do.	-	190	Du	11.4	36	-	-	do.	"dry"	7- 2-57	S,N	-	Water level below bottom of well on date of measurement.
25	V14-5d	J. Olszewsky	-	185	Du	14.3	24	-	-	do.	"dry"	7- 2-57	N	-	Do.
26	V14-4f	J. G. Thompson	-	195	Du	19.9	36	-	-	do.	14.90	7- 2-57	D,N	-	
27	V14-7c	S. F. Rockwell, Jr.	-	180	Du	10.4	30	-	-	do.	5.13	7- 2-57	S,N	-	
28	V14-7a	Pitman	-	250	Du	16.5	36	-	-	do.	11.13	7-17-57	D,N	H	
29	V14-7b	R. W. Smith	-	280	Du	17.7	24	-	-	do.	10.17	7- 3-57	D,N	-	T 54.
31	V14-7b	R. J. Henry	1907	295	Du	25.2	30	-	-	do.	10.30	7- 3-57	S,N	-	
32	V14-7b	Kellner	-	250	Du	3.9	40	-	-	do.	3.40	7- 3-57	S,N	-	
33	V14-7b	Louis Kmiec	-	285	Du	23.7	36	-	-	do.	13.20	7- 2-57	S,N	H	
34	V14-7b	Allicorn	-	240	Du	13.0	36	13	-	do.	10.70	7- 2-57	D	-	Well reportedly goes "dry" in summer.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
									ESSEX COUNTY (Continued)						
									NORTH ANDOVER (Continued)						
36	V14-7f	Allen	-	185	Du	22.3	48	-	-	Till	17.10	7- 5-57	D	-	Supplies 2 families--300 gpd used. Water level reportedly recovers at rate of 2½ inches per hour after well is pumped dry.
37	V14-7f	do.	-	180	Du	11.6	36	-	-	do.	8.35	7- 5-57	D,S,N	-	T 58.
38	V14-7a	J. Abbott	-	270	Du	12.7	50	-	-	do.	8.37	7- 9-57	D	-	
39	V14-7a	A. Sapupa	-	245	Du	17.2	32	-	-	do.	6.98	7- 5-57	D	-	T 58.
40	V14-7a	Gioia	1925	245	Du	11.9	24	-	-	do.	5.56	7- 5-57	D	-	T 59.
42	V14-7f	Elwood Cobbett	-	180	Du	11.0	30	-	-	do.	6.31	7- 5-57	D,S	H	T 58.
43	V14-4h	Sarcione	-	230	Du	9.7	36	-	-	do.	"dry"	7- 5-57	D,N	-	Water level below bottom of well on date of measurement.
44	V14-4h	Arthur Howes	1875	200	Du	11.8	30	-	-	do.	6.31	7- 5-57	D,N	-	T 61.
47	V14-4h	L. Henshaw	-	315	Du	20.8	48	-	-	do.	5.25	7- 8-57	D,S,N	-	
48	V14-4h	Adam Slomba	-	215	Du	4.5	36	-	-	do.	2.40	7- 8-57	D	-	
49	V14-4h	Walter Krorski	-	225	Du	10.4	12	-	"Sand"	do.	9.44	7- 8-57	S,N	-	Water reportedly occurs in a lens of sand at the bottom of the well.
50	V14-7a	J. Balsamo	1925	265	Du	15.8	40	-	"Sand and gravel"	do.	11.91	7- 9-57	S,N	-	T 55.
51	V14-7a	do.	1935	265	Du	26.3	50	-	do.	do.	15.08	7- 9-57	D,S	-	T 55.
52	V14-7a	do.	1940	265	Du	16.1	20	-	do.	do.	5.56	7- 9-57	S	-	T 55.
53	V14-7a	Pickand	-	285	Du	19.3	30	-	-	do.	11.37	7-17-57	D	-	
54	V14-7a	F. Renaldo	-	275	Du	18.0	30	-	-	do.	12.75	7- 9-57	D	-	T 53.
55	V14-7a	Santo Sciuto	1930	265	Du	12.0	50	-	"Sand and gravel"	do.	5.3	7- 9-57	S	-	T 54.
56	V14-7a	A. Bohnwager	1915	265	Du	11.6	50	-	do.	do.	7.57	7-10-57	D	-	T 54.
58	V14-7f	B. Farnum	-	165	Du	28.2	40	-	-	do.	12.95	7-12-57	S,N	-	T 54.
59	V14-8d	J. C. Farnum	-	170	Du	27.9	30	-	-	do.	18.79	7-12-57	D	-	T 53.
61	V14-7f	U. S. Government	1957	380	Dr	289	6	208	-	Bedrock	153	7-28-57	D	-	L. Y 27.
62	V14-8d	B. A. Farnum	-	130	Du	-	36	-	-	Till	7.00	7-18-57	D,N	-	
63	V14-8g	G. Proulx	-	135	Du	13.9	40	-	"Sand and gravel"	Outwash	9.09	7-19-57	S,N	-	
64	V14-8h	P. Knowlton	1952	160	Dn-Du	19.2	96-1½	-	"Sand"	Till	11.45	7-19-57	D	-	T 54. Well point extends 6 ft. below bottom of dug well. Water reportedly occurs in a lens of sand.
65	V14-8h	Mary E. Towne	-	130	Du	9.6	36	-	-	do.	6.44	7-19-57	S,N	-	T 54.
66	V14-8h	do.	-	125	Du	18.5	36	-	-	Outwash	15.64	7-19-57	D,S	-	T 52.
67	V14-8h	R. Conroy	1955	125	Dn	14	1½	-	Sand and gravel	do.	2	7-19-57	D	H	Well reportedly driven to bedrock.
68	V14-8h	E. Michaud	1951	125	Dn	10	1½	-	do.	do.	-	-	D	H	
69	V14-8g	D. Bourasse	-	125	Du	8.1	18	-	do.	do.	5.49	7-19-57	D,N	-	
70	V14-8g	do.	-	130	Du	9.8	24	-	do.	do.	8.89	7-19-57	S,N	-	
71	V14-7j	J. Houghton	-	205	Du	14.8	40	-	-	Till	13.30	7-19-57	D,N	-	T 55.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								NORTH ANDOVER (Continued)							
72	V14-8h	A. Hodgedon	1952	120	Du	10.0	36	-	-	Till	8.17	7-22-57	D	-	
73	V14-8f	R. Campbell	1949	110	Dr	150	6	15	-	Bedrock	-	-	D	T	Y 3.5.
74	V14-7f	J. A. Farnum	-	165	Du	8.9	30	-	-	Till	4.76	7-23-57	D,N,O	-	
77	V14-8f	W. Lachapelle	-	105	Du	14.1	24	-	-	do.	12.50	7-23-57	D	-	
78	V14-8f	J. B. Cohen	1954	105	Du-Dn	10.9-15	40-1½	-	Sand	Outwash	9.90	7-23-57	D,N	-	Water level measured in dug well.
79	V14-8j	E. Pelletier, Jr.	-	100	Du	13.6	15	-	-	Till	12.45	7-24-57	D	-	
80	V14-7f	F. Goodhue	-	195	Du	25.7	30	-	-	do.	18.63	7-24-57	S,N	-	
81	V14-8g	G. Richards	-	145	Du	17.1	36	-	-	Ice-contact deposits	13.25	7-24-57	S,N	-	
82	V14-7f	F. Goodhue	-	195	Du	16.9	36	-	-	Till	16.26	7-24-57	S,N	-	
83	V14-8a	S. Gallant	-	155	Du	16.3	36	-	-	Outwash	10.74	7-24-57	D,S,N	-	
84	V14-8a	N. Flanders	-	155	Du	19.3	42	-	-	Till	18.67	7-24-57	D,S,N,O	-	
85	V14-8e	D. Conners	1956	125	Dr	98	6	20	-	Bedrock	12	7-24-57	D	-	Y 3.5.
86	V14-8b	McMurray	-	120	Du	22.7	24	-	-	Till	20.53	7-24-57	D,N	-	
87	V14-8e	J. Dolan	1956	140	Dr	105	6	50	-	Bedrock	-	-	D	-	Y 7.
88	V14-4h	A. Miller	-	200	Du	18.6	36	-	-	Ice-contact deposits	11.97	7-25-57	D,N	-	
89	V14-5g	-	-	145	Du	13.5	20	-	-	Outwash	11.58	7-25-57	S,N	-	
90	V14-5g	A. Moysenko	-	160	Du	19.0	30	-	-	Till	18.02	7-25-57	D	-	
91	V14-8b	John Maude	-	150	Du	8.1	90	-	Sand and gravel	Outwash	5.84	7-25-57	D	-	
92	V14-8b	I. Carter	-	160	Dr	143	6	-	-	Bedrock	15	3-15-57	D	-	Y 13.
93	V14-8b	A. Szelest, Jr.	1947	160	Dr	75	6	18	-	do.	-	-	D	-	Y 6.
94	V14-5g	S. Previtera	1928	145	Du	9.4	45	-	Gravel	Outwash	6.19	7-26-57	D,N	-	
96	V14-5j	R. Teel	-	135	Du	12.3	24	-	-	Till	11.43	7-26-57	D,S	-	Pumpage reportedly is 3,000 gpd.
97	V14-8b	A. Szelest, Sr.	1935	145	Du	18.4	36	-	Gravel, boulders	Ice-contact deposits	7.98	7-26-57	D,S	-	Y 20.
99	V14-5j	W. Gorton	1950	120	Du	8.7	36	-	Fine sand	Outwash	7.65	7-26-57	D	-	
100	V14-8j	J. Lord	-	90	Du	6.0	40	-	-	Till?	5.5	7-26-57	D	-	
101	V14-8e	H. Fraize	-	110	Du	13.0	36	-	"Clay with gravel"	Outwash	12.90	7-31-57	D	-	
102	V14-8f	J. Wilcox	-	135	Du	16.2	36	-	"Gravel"	Till	15.29	8- 6-57	D	-	
103	V14-9a	C. Kittredge	-	135	Du	17.2	36	-	-	do.	11.58	8- 7-57	D,N	-	
104	V14-8f	F. Rabs	-	120	Du	14.8	40	-	"Sand and gravel"	do.	13.00	8- 7-57	D	-	
105	V14-8f	Z. Wysocki	-	130	Du	14.1	36	-	-	Outwash	11.53	8- 8-57	D,S	H	
106	V14-8f	R. Gilbert	1937	130	Du	14.0	30	-	-	Till	13.86	8- 9-57	D,N	-	
107	V14-9d	J. Jennings	-	130	Du	18.5	30	-	-	do.	16.72	8- 9-57	D,N	-	
108	V14-8b	P. Wood	-	130	Du	12.7	30	-	-	Outwash	11.23	8-11-57	D	-	
109	V14-8b	B. Brank	1947	120	Du	7	30	-	Fine sand	do.	3	8-11-57	D	H	Well supplies water for 2 houses.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								NORTH ANDOVER (Continued)							
110	V14-8b	E. Janusz	1957	145	Dr	135	6	14	-	Bedrock	-	-	D	-	Y 4.
111	V14-8b	C. Robinson	-	155	Du	13.4	24	-	-	Till	11.90	8-11-57	D,S	H	
112	V14-8b	J. Flynn	-	160	Du	20.3	36	20.3	-	do.	19.80	8-11-57	D	-	
114	V14-5b	C. Lewis	-	160	Du	18.8	24	-	Sand	Outwash	17.57	8-14-57	D,N	-	T 53.
115	V14-5b	S. Rea	-	175	Du	9.5	24	-	-	Till	9.30	8-15-57	D,N	-	
116	V14-5h	T. Bridges	-	155	Du	16.5	30	-	-	do.	15.09	8-19-57	S,N	-	
117	V14-5h	A. Kamasso	-	155	Dn	15	2½	-	Fine sand	Ice-contact deposits	"dry"	8-19-57	D	-	Water level below bottom of well on date of measurement.
118	V14-5h	S. Pas	1952	130	Du	11.9	24	-	do.	Outwash	7.22	8-19-57	D	-	
119	V14-5j	V. Pas	1932	125	Du	12.4	36	-	do.	do.	10.20	8-19-57	D	-	
121	V14-5h	A. Kamasso	-	130	Du	13.2	36	-	do.	Ice-contact deposits	11.64	8-19-57	D,N,O	-	
122	V14-5h	E. Valliere	-	130	Du	8.1	24	-	do.	Outwash	6.25	8-19-57	D	H	
123	V14-5j	E. Frazier	-	130	Du	10.5	50	-	do.	do.	7.96	8-19-57	D	-	
124	V14-5e	J. Chase	1956	140	Dr	97	6	5	-	Bedrock	12	12- -56	D	-	Y 7½.
126	V14-5e	H. Auer	-	165	Du	21.7	30	-	-	Till	17.93	8-19-57	D,N,O	-	
127	V14-8d	J. C. Farnum	-	155	Du	9.4	60	-	-	do.	7.18	7-12-57	N	-	
128	V14-8h	Mary E. Towne	-	130	Du	10.8	36	-	-	do.	10.45	7-19-57	-	-	
129	V14-8h	do.	-	125	Du	12.4	36	-	-	Outwash	8.01	7-19-57	S,N	-	
130	V14-8h	R. Conroy	1946	125	Dn	9	1½	-	Sand and gravel	do.	-	-	D	H	Well reportedly driven to crack in bedrock.
131	V14-8f	R. Campbell	-	110	Du	8.2	30	-	-	Till	5.20	7-22-57	D	-	
134	V14-8e	D. Conners	-	140	Du	16.9	50	16.95	-	do.	12.70	7-24-57	D,N	-	
136	V14-8b	A. Szelest, Sr.	-	150	Du	15.8	-	-	Gravel, boulders	Ice-contact deposits	15.33	7-26-57	D,N	-	
137	V14-8f	J. Wilcox	-	130	Du	11.4	30	-	"Gravel"	Till	9.35	8- 6-57	D,S	-	
138	V14-8f	do.	-	125	Du	9.6	48 x 72	-	-	Outwash	8.44	8- 6-57	D,N	-	
139	V14-9a	C. Kittredge	-	120	Du	18.3	36	-	-	Till	16.18	8- 7-57	S,N	-	Y 6.
142	V14-8f	R. Gilbert	1956	135	Dr	135	6	20	-	Bedrock	2	4- -56	D	-	Y 5.
143	V14-8f	do.	1937	130	Du	15.4	24	-	-	Till	14.70	8- 9-57	D,N	-	
144	V14-8b	E. Janusz	-	145	Du	14.2	36	14	-	do.	9.53	8-11-57	D,N	-	
145	V14-5b	C. Lewis	-	150	Du	20.0	40	-	Sand	Outwash	15.20	8-14-57	S,N	-	
146	V14-5h	T. Bridges	-	150	Du	18.3	30	-	-	Till	13.73	8-19-57	D,N	-	
147	V14-5h	A. Kamasso	-	155	Du	13.3	24	18	Fine sand	Ice-contact deposits	12.90	8-19-57	D	-	
148	V14-5j	V. Pas	-	125	Du	9.0	36	-	do.	Outwash	7.78	8-19-57	S	H	
149	V14-5e	E. Roberts	1956	150	Du	7.5	36	-	do.	do.	6.03	8-19-57	D,N	-	
150	V14-8g	D. Bourasse	-	130	Du	3.6	24	-	Sand and gravel	do.	2.2	7-19-57	N	-	
154	V13-2e	Leo LeTourneau	-	120	Du	10.9	36	-	-	Till	7.84	7-11-58	D	B	T 50.
155	V14-8f	U. S. Geol. Survey	1957	120	A,T	13½	4	13½R	-	-	10	10- 7-57	-	-	A. L.
156	V14-7f	do.	1958	205	A,T	5	4	5R	-	-	-	-	-	-	A. L.
157	V14-7a	do.	1958	250	A,T	18	4	18R	-	-	3.45	10- 2-58	-	-	A. L.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								NORTH ANDOVER (Continued)							
158	V14-7a	U. S. Geol. Survey	1958	235	A,T	32½	4	-	-	-	8	10- 2-58	-	-	A. L.
159	V14-4j	do.	1958	155	A,T	5	4	5R	-	-	-	-	-	-	A. L.
160	V14-5g	do.	1958	195	A,T	58	4	58R	-	-	7.05	10- 2-58	-	-	A. L.
161	V14-8a	do.	1958	200	A,T	21	4	-	-	-	6.00	10- 2-58	-	-	A. L.
162	V14-5e	do.	1958	140	A,T	13	4	-	-	-	-	-	-	-	A. L.
163	V14-5e	do.	1958	135	A,T	15	4	15R	-	-	3.50	10- 3-58	-	-	A. L.
164	V14-5j	do.	1958	125	A,T	50	4	50R	-	-	4.27	10- 3-58	-	-	A. L.
165	V14-8e	do.	1958	105	A,T	78	4	78R	-	-	7.76	10- 3-58	-	-	A. L.
166	V14-8g	do.	1959	130	A,T	11	4	11R	-	-	-	-	-	-	A. L.
168	V14-7f	B. Farnum	-	175	Du	23.8	36	-	-	Till	13.95	7-17-57	N	-	
169	V14-4j	U. S. Geol. Survey	1959	160	A,T	9	4	9R	-	-	-	-	-	-	A. L.
170	V14-9d	do.	1959	130	A,T	23	4	23R	-	-	-	-	-	-	A. L.
								NORTH READING							
224	V13-2e	A. F. Kerr	1946	120	Du-Dr	18.3-85	36-6	10?	-	Bedrock	15.25	7-10-58	D	-	Y 5 of bedrock well. Water level measured in dug well.
								PEABODY							
40	V13-6d	-	-	190	Du	4.9	36	-	-	Till	1.50	11- 8-55	N	None	
41	W13-4h	Batakis	-	110	Du	32.0	36	-	-	do.	19.35	7- 3-58	N,O	None	
42	W13-4g	Blodgian	-	95	Du	35	60	-	-	do.	19.57	7- 3-58	D,N	None	
43	W13-7a	Southwick	1958	130	Du	5.0	48	-	Sand and gravel	Ice-contact deposits	4.00	7- 3-58	N	-	
44	W13-7a	do.	1912	130	Du	21	48	-	do.	do.	20	7- 3-58	D,N	Pn	C.
45	W13-7a	C. A. Bradstreet	-	90	Du	12.4	48	-	do.	do.	6.28	7- 3-58	D	Pn	T 49.
47	V13-8c	Roger Stone	-	90	Dr	65	6	-	-	Bedrock	13.42	7-11-58	D	Pn	
49	V13-6j	J. W. Staten	-	105	Du	37.2	36	-	-	Ice-contact deposits	35.43	7-11-58	D,N,O	None	T 50.
50	W13-7a	U. S. Geol. Survey	1958	130	A,T	7½	4	7½R	-	-	-	-	-	-	A. L.
51	V13-6j	do.	1958	110	A,T	5	4	5R	-	-	-	-	-	-	A. L.
52	V13-6j	do.	1958	50	A,T	35	4	35R	-	-	7	10- 6-58	-	-	A. L.
53	V13-6f	do.	1958	60	A,T	27	4	27R	-	-	-	-	-	-	A. L.
54	V13-6h	W. B. Moore	-	155	Du	23.2	40	-	"Coarse gravel"	Till	8.49	8- 6-59	S	None	T 52.
55	V13-6e	G. H. Peterson	-	180	Du	17.4	36	17?	"Gravel"	do.	8.91	8- 6-59	D,N	Pn	T 51.
56	V13-6e	Robert Wentworth	-	100	Du	14.8	40	-	"Blue gravel"	do.	4.72	8- 6-59	S	C	T 50.
58	V13-6a	Mass.Dept.Pub.Wks.	1936	38.6	Dn,T	7.5	2½	7.5R	-	-	-	-	-	-	A. L.
97	V13-6j	City of Peabody	1956	60.2	GP	47	18	-	Sand and gravel	Outwash	3.38	3- 2-56	PS	C	Y 700.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								PEABODY (Continued)							
98	W13-4g	City of Peabody	1959	59.5	GP	54.5	18	-	Sand and gravel	Ice-contact deposits?	1.8	4-17-59	PS	C	Y 730.
99	V13-9b	do.	1955	110	Dn	36.4	2½	-	-	-	-	-	T	None	A. L.
100	V13-9c	do.	1955	100	Dn	30.5	2½	-	-	-	-	-	T	None	A. L.
101	V13-6j	do.	1955	50	Dn	53.1	2½	-	-	-	-	-	T	None	L.
102	V13-6j	do.	1955	50	Dn	-	2½	-	Sand and gravel	Outwash	+0.5	9- -55	T	-	Y 33; dd 1.0.
103	V13-6j	do.	1955	60	Dn	20.2	2½	-	-	-	-	-	T	None	A. L.
104	V13-6f	do.	1955	50	Dn	13.2	2½	13.2R	-	-	-	-	T	None	A. L.
106	V13-6e	do.	1955	50	Dn	26.2	2½	26.2R	Sand	Outwash	-	-	T	None	A. L. Well reportedly "pumps freely".
107	V13-6e	do.	1955	50	Dn	2.6	2½	2.6	-	-	-	-	T	None	A. L.
109	V13-6j	do.	1955	70	Dn	48.0	2½	-	-	-	-	-	T	None	L.
110	V13-6j	do.	1955	70	Dn	-	2½	-	Sand and gravel	Ice-contact deposits	0.6	9- -55	T	-	A. Y 42; dd 2.3. Water reportedly contained 5.7 ppm of iron.
111	V13-9c	do.	1955	100	Dn	12.6	2½	-	-	-	-	-	T	-	A.
112	V13-9c	do.	1955	100	Dn	17.3	2½	17.3R	-	-	-	-	T	-	A. L.
113	V13-9b	do.	1955	130	Dn	23.8	2½	23.8R	-	-	-	-	T	-	A. L.
114	V13-6j	do.	1955	60.2	Dn	59	2½	-	Coarse sand and gravel	Ice-contact deposits	-	-	T	-	A. L. Well at site of Municipal Supply well Peabody 97.
115	V13-6j	do.	1955	60	Dn	57	2½	-	do.	do.	1.5	9- -55	T	-	A. Y 75; dd 1.3.
116	V13-6f	do.	1955	50	Dn	32.8	2½	32.8R	do.	Outwash?	-	-	T	-	A. L. Well reportedly "pumps free".
117	V13-6j	do.	1955	50	Dn	28.2	2½	-	do.	do.	-	-	T	-	L. Well reportedly "pumps free".
118	W13-4g	do.	1958	60	Dn	54.5	2½	-	do.	Ice-contact deposits	1.8	5- 6-58	T	-	A. L. Y 50.
								ROWLEY							
17	W14-6a	Owen Lloyd	-	85	Du	26.3	36	-	-	Ice-contact deposits	14.44	9- 5-58	D	Pn	
18	W14-6a	do.	-	75	Du	13.6	36	-	-	do.	12.10	9- 5-58	N	None	
19	W14-6a	Charles Balser	-	95	Du	19.1	36	-	-	Till	16.60	9- 5-58	D	Pn	
22	W14-5b	George Sutherland	-	75	Du	9.3	24	-	-	do.	7.05	9- 5-58	D	T	
26	W14-5f	H. C. Budd	-	75	Du	10.5	48	-	-	Ice-contact deposits	7.50	9- -58	D	Pn	
54	W14-6a	Town of Rowley	1956	70	Dn	20.9	2½	20.9R	Sand, gravel, and clay	Outwash	0.9	3- 2-56	T	None	A. L.
55	W14-5c	do.	1956	70	Dn	26.8	2½	-	Sand and gravel	Ice-contact deposits	0.8	3- 3-56	T	None	A. L. Y 20.

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								TOPSFIELD							
1	W14-9d	C. H. Taintor	-	130	Du	22.5	30	-	-	Till	12.57	2- 8-36	D,N,O	None	Formerly Topsfield 13.
5	W14-8d	Town of Topsfield	-	60	Du	14.2	48	-	-	Outwash	10.67	9-23-57	PS, N,O	H	C.
6	W14-7j	U. S. Geol. Survey	1957	50	A,T	35	4	35R	-	-	5	10- 9-57	-	-	A. L.
7	W14-7j	do.	1957	40	A,T	68	4	68R	-	-	-	-	-	-	A. L.
8	W14-4j	do.	1957	90	A,T	24	4	24R	-	-	2	10- 9-57	-	-	A. L.
10	W14-7f	do.	1957	60	A,T	40	4	40R	-	-	14	10- 7-57	-	-	A. L.
11	W13-1f	Alfalfa Farm	-	60	Du	21.0	36	-	-	Ice-contact deposits	9.90	7- 2-58	S,N	-	T 50.
12	W14-7f	-	-	60	Du	21.6	36	-	-	Outwash	16.2	7-11-58	-	-	
13	W14-5g	U. S. Geol. Survey	1957	70	A,T	7	4	7R	-	-	-	-	-	-	A. L.
14	W14-9a	do.	1957	30	A,T	7	4	7R	-	-	-	-	-	-	A. L.
15	W14-9a	do.	1957	40	A,T	5	4	5R	-	-	-	-	-	-	A. L.
16	W14-8c	do.	1957	50	A,T	7	4	7R	-	-	-	-	-	-	A. L.
18	W14-8f	do.	1958	50	A,T	14	4	14R	-	-	-	-	-	-	A. L.
19	W14-8f	do.	1958	45	A,T	9	4	9R	-	-	-	-	-	-	A. L.
20	W14-8b	do.	1958	70	A,T	54	4	54R	-	-	17	10-14-58	-	-	A. L.
21	W14-9g	do.	1958	40	A,T	10	4	10R	-	-	-	-	-	-	A. L.
22	W14-8f	do.	1958	45	A,T	90	4	90	-	-	15-20	10-14-58	-	-	A. L.
23-52	W14-8b	Town of Topsfield	1949, 1958	45	Dn	36	2½	-	Gravel	Outwash	-	-	PS	-	L. Y 150 of 30 driven wells.
53	W14-8d	L. A. Perkins	-	75	Du	12.9	40	-	do.	do.	5.87	7-22-59	N	Pn	T 56.
54	W14-8d	M. R. Hodges	-	65	Du	14.8	36	-	-	do.	5.52	7-22-59	N	None	T 53.
55	W14-8h	Mrs. Oliver Thayer	-	150	Du	14.1	72	-	-	Till	4.48	7-27-59	N	None	T 53.
59	W14-8j	Benjamin Pollard	-	50	Du	17.2	24	-	-	do.	4.06	7-27-59	D	-	T 57.
60	W14-8h	Richard Wyman	-	55	Du	17.9	48	-	-	do.	14.44	7-27-59	N	None	T 49.
61	W14-7f	B. W. English	-	60	Du	16.3	36	-	Sand	Outwash	12.55	7-30-59	N	None	T 50.
62	W13-2b	Raymond Hebert	-	95	Du	33.3	60	-	-	Till	9.78	8- 7-59	N	None	T 52.
63	W13-2b	I. F. Atwood	-	150	Du	15.3	30	-	-	do.	8.05	8- 7-59	S	H	T 51.
64	W13-2b	Phillip Hager	1957	65	Du	12.8	72	-	Gravel	Outwash	5.71	8- 7-59	S	Pn	T 52.
65	W13-2a	S. Curtis	-	170	Du	17.1	30	-	-	Till	10.39	8- 7-59	D	Pn	T 56.
66	W13-2a	C. R. Mann	-	50	Du	19.9	36	-	-	do.	15.03	8-11-59	N	None	T 51.
67	W13-1c	B. T. Warren	-	140	Du	18.1	12 ft.	-	"Sand and gravel"	do.	5.04	8-10-59	D	Pn	Supplies 2 houses and barn.
68	W13-1c	J. D. Phillips	-	180	Du	5.8	60	-	"Gravel"	do.	0.72	8-10-59	D,S	Pn	
69	W13-1f	do.	-	90	Du	12.4	30	-	-	do.	3.30	8-10-59	D	Pn	Supplies 4 houses.
70	W14-8g	G. L. Goodrich	-	125	Du	15.9	70+	-	-	do.	5.39	8-17-59	N	Pn	
71	W14-7j	Anna Kloss	-	55	Du	15.5	48	-	-	do.	7.11	8-17-59	N	H	
72	W14-8h	Max Katz	1932	65	Du	17.6	-	-	"Sand"	do.	6.34	8-17-59	S	Pn	
74	W14-8e	F. R. Moscarito	-	150	Dr	310	6	96	-	Bedrock	21.22	8-17-59	D	T	Pump set at 176 feet.
75	W14-8a	R. F. Ray	1956	70	Dr	128	-	-	-	do.	-	-	D	C	Y 6.
76	W14-8a	-	-	70	Dn	20.6	1½	-	Gravel?	Outwash	19.16	8-17-59	-	-	

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								TOPSFIELD (Continued)							
77	W14-4j	Robert Reagan	-	100	Du	28.4	36	28.4	"Gravel"	Outwash	13.08	8-17-59	D	C	Y 5.
79	W14-8a	H. F. Broderick	-	70	Du	11.8	48	-	Gravel	Ice-contact deposits	9.71	8-20-59	D	-	
82	W14-7j	Arnold Lawson	-	160	Du	22.1	48	-	-	Till	9.81	8-24-59	D,S,N	H	
83	W14-4j	R. C. Dick	-	90	Du	9.8	24	-	Gravel	Outwash	6.97	8-24-59	D	Pn	
84	W14-8c	R. H. Saunders	-	55	Dr	157	6	12	-	Bedrock	-	-	D	J	Y 3.
85	W14-8c	A. L. Robinson	1956	55	Dn	25-30	3	-	Gravel	Outwash	-	-	D	J	Y 4-5; reportedly no drawdown after 24 hours pumping.
87	W14-8a	Alfred Muldoon	1956	60	Dn	32	4	-	do.	-	20	-56	D	J	Y 15.
88	W14-8e	Peterson and Thing	1956	70	Dr	93	6	-	-	Bedrock	-	-	D	J	Y 14. Supplies 2 families.
89	W14-8a	D. H. Coultera	1957	85	Dn	40	-	-	Gravel	Outwash	-	-	D	Pn	Y 6.
91	W14-8a	L. L. Hartdorn	1957	80	Dr	158	6	30	-	Bedrock	25-30	-57	D	J	Y 8. T 52. Supplies 6,000 gal. swimming pool.
96	W13-2a	J. H. Gardiner	1950	95	Du-Dr	19.2-350	72-6	-	-	Till and bedrock	13.65	8-31-59	D	C	Y 9-10 of bedrock well. Water level measured in dug well.
98	W13-2b	C. H. Wellman	1952	225	Dr	450	6	80	-	Bedrock	-	-	D	C	Y 8.
99	W14-8a	Jack Angeline	-	70	Dr	68	6	18	-	do.	18	4- -59	D	J	Y 4.
103	W14-7j	Mass.Dept.Pub.Wks.	1957	34.2	Dn,T	23.0	2½	-	-	-	0.5	8- 5-57	-	-	A. L.
								WENHAM							
1	X13-1e	Mitchell	1907	60	Du	11	48	-	"Quicksand"	Ice-contact deposits	5.90	6-24-58	D,O	Pn	
2	W13-3f	J. R. Reynolds	-	70	Du	17.7	42	-	-	Outwash	10.92	6-26-58	N,O	None	T 53.
3	X13-1d	Louis A. Dodge	-	85	Du	20	36	-	-	Till	11.31	6-26-58	D,N	None	
4-13	W13-3e	Town of Wenham	-	35	Dn	35	2	-	-	Ice-contact deposits	-	-	PS,N	-	10 wells averaging 35 ft. in depth.
14	W13-3e	do.	1953	35	GP	52	-	-	-	do.	-	-	PS	-	Y 450.
15	W13-3e	do.	1958	35.8	GP	72	18	-	-	do.	2.7	10-14-58	PS	-	Y 720; dd 16 after 240 hours pumping.
16	W13-3a	U. S. Geol. Survey	1959	35	Dn	20.1	1¼	-	Sand	Outwash	0.68	6-16-59	O	None	L.
19	W13-3d	H. A. Erhard	-	80	Du	18.1	24	-	do.	Ice-contact deposits?	8.33	8-12-59	N	None	
20	W13-3d	F. L. Higginson	-	80	Du	11.5	36	-	Gravel	Ice-contact deposits	6.84	8-12-59	N	None	
21	W13-2f	J. S. Amory	-	80	Du	5.1	72	-	-	Outwash	2.35	8-13-59	D	-	
22	W13-3f	E. P. Roberts	-	60	Du	34.3	24-84	-	Gravel	do.	6.49	8-13-59	D,N	None	
23	W13-3f	H. G. Dodge	-	60	Du	16.3	48	-	do.	do.	9.39	8-13-59	D,N	Pn	
24	W13-3g	E. J. Splaine	-	70	Du	15.7	40	15.7	-	Ice-contact deposits	9.06	8-13-59	N	None	
25	W13-3d	D. E. Currier	1930	60	Dr	44.6	8	-	-	Bedrock	8.64	8-14-59	N	None	Y 15.
26	W13-3f	Leroy Clarke	-	60	Du	32.1	36	-	Gravel	Outwash	27.54	8-14-59	N	H	

Table 2.--Records of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY (Continued)							
								WENHAM (Continued)							
28	W13-3g	Samuel Hoar, Jr.	-	80	Du	17.8	48	-	"Sand and gravel"	Till?	5.53	8-31-59	D	C	T 58.
29	W13-2j	G. A. Perkins	-	100	Du	14.9	18	-	"Sand"	Till	7.60	8-31-59	D	-	T 53.
30	X13-1h	Miller	1959	50	Dn	32	2½	-	Sand and gravel	Ice-contact deposits	5.17	8- 6-59	D	Pn	L. Y about 25; dd 4 after 1 hour of pumping. T 44. This well representative of 8 wells at this location.
31	X13-1h	T. C. Hollander	1940	90	Dr	228	-	-	-	Bedrock	-	-	D	-	Y 7.
32	X13-1h	do.	-	80	Du	14.2	30	-	-	Till	4.56	7-22-59	N	None	
33	X13-1d	Neil Ayers	-	60	Du	8.7	72	-	-	Ice-contact deposits	2.21	5-20-59	N	None	
34	X13-1d	do.	-	75	Du	16.0	36	-	-	do.	9.41	5-20-59	D,N	None	
35	X13-1d	Frederick Ayers, Sr.	-	30	Dn	40	2½	-	Gravel	do.	-	-	N	None	C. Water flows from pipe about 2 feet above marsh level. Flow 1 gpm.
36	X13-1d	do.	-	30	Dn	30-35	2½	-	do.	do.	2	6-12-59	D,N	None	Group of 4 driven wells.
37	X13-1d	Frederick Ayers, Jr.	-	105	Du	30.0	96	-	-	Till	6.97	6-12-59	D,N	None	
38	X13-1d	Frederick Ayers, Sr.	1930	50	Dr	387	6	81	-	Bedrock	20	10-24-30	D	T	L. Y 25; dd 150 after 8 hours pumping. C.
40	X13-1e	E. A. Osgood, Sr.	-	65	Du	17.9	30	-	-	Ice-contact deposits	9.99	5-14-59	D,N	None	
41	X13-1d	David Taylor	-	70	Dn	9.1	2½	-	-	do.	2.77	5-20-59	N	None	
42	X13-1g	E. P. Motley	-	45	Du	15.9	84-30	-	Sand and gravel	do.	6.96	6-11-59	D	J	Yield is at least as great as the capacity of the pump: 7½ gpm.
43	X13-2g	J. M. Campbell	-	50	Du	8.6	24	-	Sand	Outwash?	3.94	6-24-59	D	Pn	
52	X13-2g	Mass.Dept.Pub.Wks.	1951	63.0	Dn,T	12.8	2½	12.8R	-	-	-	-	-	-	A. L.
56	X13-1g	U. S. Geol. Survey	1959	45	A,T	35	4	35R	-	-	-	-	-	-	A. L.
57	X13-1j	do.	1959	55	A,T	10	4	10R	-	-	-	-	-	-	A. L.
58	X13-1f	do.	1959	50	A,T	37	4	37R	-	-	-	-	-	-	A. L.
59	W13-2f	do.	1959	70	A,T	20	4	20R	-	-	-	-	-	-	A. L.
60	W13-3d	do.	1959	70	A,T	27	4	27R	-	-	-	-	-	-	A. L.
61	W13-3d	do.	1959	80	A,T	13	4	13R	-	-	-	-	-	-	A. L.
63	W13-3f	do.	1959	55	A,T	10	4	10R	-	-	-	-	-	-	A. L.
64	W13-3f	do.	1959	40	A,T	69	4	69R	-	-	-	-	-	-	A. L.
66	W13-2f	Salem-Beverly Water Board	1952	39	Dn,T	14	-	-	-	-	-	-	-	-	A. L.
67	W13-3d	do.	1952	38	Dn,T	15	-	-	-	-	-	-	-	-	A. L.
72	W13-3e	do.	1952	37	Dn,T	24	-	-	-	-	-	-	-	-	A. L.
74	X13-2g	U. S. Geol. Survey	1959	45	A,T	15	4	15R	-	-	-	-	-	-	A. L.

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts

(Thicknesses and depths below land-surface are given in feet)

	Thickness	Depth
ANDOVER 153. Alt. about 195 ft.		
Geologist's log of auger hole.		
Fill	3.0	3.0
Ice-contact deposits:		
Sand, fine to medium, some very coarse, silty, brown; gravel, fine to medium, subangular to subrounded, brown	2.0	5.0
Sand, fine to medium, silty, brown, with some fine gravel, mostly subrounded	5	10
Sand, mostly very fine to fine, some medium, gray; some gravel, very fine, angular; clay	5	15
Sand, very fine; clay, gray; silt; gravel, very fine	8	23
ANDOVER 155. Alt. about 190 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, mostly medium, some fine and coarse, brown; gravel, very fine to coarse, brown; some silt	12	12
Refusal:		
Till?	at 12	
BEVERLY 16. Alt. 67.5 ft.		
Driller's log of test hole.		
Ice-contact deposits:		
Loamy sand and stones	2.5	2.5
Sand, firm, loamy	3.0	5.5
Sand and gravel, hard	1.1	6.6
Refusal:		
Bedrock or boulders	at 6.6	
This log is representative of test holes Beverly 1-19.		
BEVERLY 39. Alt. 44.1 ft.		
Driller's log of test hole.		
Swamp deposits:		
Swamp mud	3.0	3.0
Outwash:		
Clay and very fine sand	5.0	8.0
Sand, loose, medium	19.0	27.0
Sand, compact, with some clay.	11.2	38.2
This log is representative of test holes Beverly 29-39 and Beverly 40-48.		
BEVERLY 49. Alt. 74.4 ft.		
Driller's log of test hole.		
Ice-contact deposits:		
Sand, loose, and gravel	4.0	4.0
Till?:		
Sand, gravel, rocks, and clay, very compact	13.0	17.0
Refusal:		
Rock obstruction	at 17.0	
This log is representative of test holes Beverly 49-64.		
BEVERLY 80. Alt. 82.2 ft.		
Driller's log of test hole.		
Ice-contact deposits?:		
Loam	2.0	2.0
Till:		
Sand, gravel, and trace of clay, very compact	5.0	7.0
Refusal:		
Rock obstruction	at 7.0	
This log is representative of test holes Beverly 64-80.		
BEVERLY 81. Alt. about 35 ft. (Original altitude of land surface about 50 feet.)		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to coarse, angular, brown; gravel, fine to medium, rounded; some layers poorly sorted, silty, most layers moderately well sorted	52	52
Refusal:		
Bedrock or boulder	at 52	
Auger hole in pit about 15 feet below original land surface.		
BOXFORD 5. Alt. 42.3 ft.		
Driller's log of test hole.		
Swamp deposits:		
Mud	2.7	2.7
Outwash:		
Sand and gravel	9.8	12.5
Sand, fine	16.7	29.2
Till?:		
Sand, gravel, and clay, compact	5.2	34.4
Refusal:		
Rock obstruction	at 34.4	
This log is representative of test holes Boxford 1-8.		
BOXFORD 10. Alt. 48.6 ft.		
Driller's log of test hole.		
Outwash:		
Sand, fine, loose	6.0	6.0
Sand, fine, with a little gravel	17.0	23.0
Till?:		
Sand, gravel, and clay, compact	7.2	30.2
Refusal:		
Rock obstruction		30.2
This log is representative of test holes Boxford 9-20.		
BOXFORD 30. Alt. 72.7 ft.		
Driller's log of test hole.		
Swamp deposits:		
Swamp mud	2.0	2.0
Outwash:		
Sand, gravel, with some clay, very compact	30.0	32.0
Refusal:		
Rock obstruction	at 32.0	
This log is representative of test holes Boxford 21-31.		
BOXFORD 179. Alt. about 120 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, some granules, few pebbles	5	5
Refusal:		
Probably bedrock	at 5	
BOXFORD 180. Alt. about 100 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, very fine, and silt, brown; very coarse pebble gravel, with silt and sand, compact	2.5	2.5
Refusal:		
Cobble or boulder	at 2.5	
BOXFORD 181. Alt. about 110 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to coarse, pebbles, cobbles	5	5
Refusal	at 5	
BOXFORD 182. Alt. about 110 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine, granular, and pebbles	5	5
Refusal	at 5	
BOXFORD 183. Alt. about 90 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, pebbles, cobbles	4	4
Refusal	at 4	
BOXFORD 184. Alt. about 135 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, silty, gray-brown	7	7
Sand, medium, brown	7	14
Sand, brown, and gravel, fine to coarse	6	20
Gravel, coarse, and boulders, dense	4	24
BOXFORD 185. Alt. about 80 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand and gravel, poorly sorted, silty, subrounded, light brown; sand changes to yellow at about 12 feet.	15	15
Gravel, and boulders, dense	4	19
Refusal:		
Bedrock or boulders	at 19	
BOXFORD 186. Alt. about 70 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, yellow-brown, and medium gravel, well sorted	17	17
Gravel, coarse	1	18
Sand, fine, silty, yellow-brown, becomes denser at depth, no sample recovery from bottom	5	23
Refusal:		
Bedrock or boulder	at 23	
BOXFORD 187. Alt. about 45 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, silty, brown	48	48
Gravel and sand, dense	4	52
Till:		
Clay, silt, some gravel; hard, gray	1	53
Refusal:		
Bedrock?	at 53	
BOXFORD 223. Alt. 58.4 ft.		
Driller's log of test hole.		
Outwash:		
Sand and gravel, mixed with loam	3.0	3.0
Sand and gravel	9.2	12.2
Sand, very fine, with clay	9.5	21.7
Sand, gravel, and rock, with some clay	0.5	22.2
Refusal:		
Rock obstruction	at 22.2	
This log is representative of test holes Boxford 223-240.		
BOXFORD 244. Alt. 62.5 ft.		
Driller's log of test hole.		
Outwash:		
Sand, fine, with trace of clay	7.0	7.0
Sand, very fine, and clay, compact	13.0	20.0
Refusal:		
Rock obstruction	at 20.0	
This log is representative of test holes Boxford 241-250.		
BOXFORD 251. Alt. about 150 ft.		
Driller's log of water well.		
Ice-contact deposits:		
Sand and cobble gravel	10	10
Till?:		
Hardpan	8	18
Bedrock	at 18	
BOXFORD 252. Alt. about 150 ft.		
Driller's log of water well.		
Ice-contact deposits:		
Sand, gravel, cobbles	14	14
Bedrock	at 14	
DANVERS 5. Alt. about 50 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, mostly fine, some medium, olive-brown; gravel, fine to medium, few pebbles; some silt	7.5	7.5
Sand, mostly fine, silty, with clay	1.5	9.0
Sand, mostly fine, some medium; some small pebbles; silt; some clay, olive-brown	26	35
Sand and coarse gravel	4	39
Refusal:		
Cobbles or small boulders	at 39	

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
DANVERS 7. Alt. about 35 ft.		
Geologist's log of auger hole.		
Fill	1	1
Swamp deposits:		
Muck and organic material, somewhat sandy, silty, black	14	15
Outwash:		
Sand, silty, with some organic material, brown	10	25
Sand, fine, silty, gray. Struck rock at 36 feet	15	40
Refusal:		
Bedrock?		at 40
DANVERS 16. Alt. 43.3 ft.		
Driller's log of test hole.		
Swamp deposits:		
Mud	10.0	10.0
Outwash:		
Sand, with some clay, little gravel	10.0	20.0
Sand and clay, compact	6.7	26.7
This log is representative of test holes Danvers 16 and 17 and Middleton 81 and 82.		
DANVERS 30. Alt. 96.8 ft.		
Driller's log of test hole.		
Fill:		
Sand and gravel	4.8	4.8
Outwash:		
Sand, fine, and gravel	8.2	13.0
Sand, fine, and gravel, coarse	4.0	17.0
Refusal:		
Ledge or boulder		at 17.0
This log is representative of test holes Danvers 18-45.		
DANVERS 146. Alt. 123.3 ft.		
Driller's log of test hole.		
Till:		
Loamy sand and gravel	1.5	1.5
Sand, gravel, and boulders, hard	7.5	9.0
Sand and gravel, hardpan	2.5	11.5
Refusal:		
Bedrock or boulder		at 11.5
This log is representative of test holes Danvers 132-148.		
DANVERS 158. Alt. 79.8 ft.		
Driller's log of test hole.		
Ice-contact deposits:		
Loam	1.0	1.0
Sand, fine, loose	5.0	6.0
Sand and gravel, coarse; trace of clay; compact	6.2	12.2
Till?:		
Clay, sand, and gravel, compact	6.0	18.2
Very compact clay, sand, and gravel	4.0	22.2
Refusal:		
Rock obstruction		at 22.2
This log is representative of test holes Danvers 149-163.		
DANVERS 187. Alt. about 60 ft.		
Owner's log of water well.		
Outwash:		
Sand and gravel, stratified, moderately well sorted	20	20
Till:		
Silty sand matrix, dense, compact	79	99
Bedrock, "soft"		at 99
DANVERS 189. Alt. 39 ft.		
Driller's log of test hole		
Swamp deposits:		
Peat	5	5
Outwash:		
Sand and gravel	22	27
Refusal		at 27
DANVERS 190. Alt. 39 ft.		
Driller's log of test hole.		
Swamp deposits:		
Muck	14	14
Ice-contact deposits?:		
Sand, with silt near bottom	33	47
DANVERS 194. Alt. about 60 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, brown, and small gravel	17	17
Sand, brown, and gravel; little clay	5	22
Sand, brown, gravel, and clay	5	27
Sand, coarse, red, and clay	5	32
Refusal		at 32
DANVERS 195. Alt. about 60 ft.		
Driller's log of test well.		
Till:		
Sand, broken stone, clay	28.5	28.5
HAMILTON 29. Alt. about 20 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to coarse, poorly sorted; angular pebbles, cobbles	10	10
Sand, very fine, brown, some silt, few granules	5	15
Sand, very fine, gray, becoming progressively siltier with depth	23	38
Gravel and cobbles	4	42
Refusal:		
Bedrock or boulder		at 42
HAMILTON 56. Alt. about 45 ft.		
Owner's log of water well.		
Marine unit:		
Loam	1	1
Clay, hard, gray-brown	3	4
Ice-contact deposits:		
Gravel	24	28
HAMILTON 59. Alt. about 35 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, clay; sharp gravel and clay	22	22
Till?:		
Clay, sand, sharp gravel	7.5	29.5
Refusal		at 29.5
This log is representative of test wells Hamilton 59 and 60.		
HAMILTON 61. Alt. about 40 ft.		
Driller's log of test well.		
Outwash:		
Sand, fine, some gravel and clay	27.5	27.5
Sand, fine, and clay	5.2	32.7
Sand, sharp gravel, and clay.	24.6	57.3
Sand, fine, sharp gravel, and clay	2.8	60.1
This log is representative of test wells Hamilton 61 and 62.		
HAMILTON 69. Alt. about 40 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine, sharp gravel, and clay	21.1	21.1
Refusal		at 21.1
This log is representative of test wells Hamilton 68-70.		
HAMILTON 71. Alt. about 50 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine to medium, brown, and gravel	20	20
Sand, fine, gray, and clay	44	64
Sand, fine, gray, and gravel.	11	75
Refusal		at 75
This log is representative of test wells Hamilton 71 and 72.		
HAMILTON 73. Alt. about 50 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	3	3
Ice-contact deposits:		
Sand, brown, and gravel	15	18
Sand, fine, gray, and clay	33	51
Sand, fine to medium, gray, and gravel, with some clay.	3	54
Sand, fine to medium, brown and gray, and gravel	17	71
Refusal		at 71
HAMILTON 74. Alt. about 55 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine to medium, brown, with large broken stones	15	15
Till?:		
Sand, fine to medium, brown, broken stones, with gray clay	6.8	21.8
Refusal		at 21.8
This log is representative of test wells Hamilton 74 and 75.		
HAMILTON 76. Alt. about 50 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine to medium, brown, with sharp broken stones	15	15
Sand, fine to medium, brown and gray, with sharp gravel	5	20
Sand, fine, gray, and gravel, with clay	10.6	30.6
Sand, fine to medium, brown, and gravel	2.4	33.0
Refusal:		
Bedrock		at 33.0
HAMILTON 77. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	1	1
Ice-contact deposits:		
Sand, fine to medium, brown, and gravel, with clay	17	18
Sand, fine to medium, gray, and gravel, with specks of clay	5	23
Sand, fine to medium, gray, and clay	10.5	33.5
Sand, fine to medium, gray, and gravel	5.5	39
Sand, fine to medium, gray, and gravel, with clay	5	44
Sand, fine to medium, gray, and sharp gravel	6	50
Sand, fine to medium, gray, and sharp gravel, with clay, tight	3.8	53.8
HAMILTON 80. Alt. about 50 ft.		
Driller's log of water well.		
Swamp deposits:		
Peat	15	15
Outwash:		
Sand, fine to medium, gray, and gravel, with some clay.	8	23
Sand, fine to medium, brown, and gravel	10	33
Sand, fine to medium, gray, and clay	4	37
Sand, fine to medium, gray, and gravel, with clay	6.5	43.5
Sand, fine to medium, gray, with sharp gravel	2.5	46.0
This log is representative of test wells Hamilton 78, 79, and 80.		
HAMILTON 81. Alt. about 50 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	2	2
Outwash:		
Sand, fine to medium, brown, and gravel	18	20
Sand, fine, gray	4	24
Sand, fine, gray, and clay	5	29
Sand, fine, gray, and gravel, with clay	5	34
Sand, fine to medium, brown, and gravel	5	39
Sand, fine to medium, brown, and gravel, with clay	5	44
Sand, fine, brown, and clay	5	49
Sand, fine to medium, brown, and gravel	5	54
Sand, fine, gray, and sharp gravel	2.5	56.5

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
HAMILTON 82. Alt. about 50 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	2	2
Outwash:		
Sand, fine, gray, and gravel, with clay	17	19
Sand, fine, gray, and clay	21	40
Sand, fine, gray, and clay, with some gravel	12.0	52.0
Refusal		at 52.0
HAMILTON 83. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	5	5
Outwash:		
Sand, fine, gray, and clay	12	17
Till:		
Hardpan		at 17
HAMILTON 84. Alt. about 35 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	2	2
Outwash:		
Sand, fine, brown, clay, and large broken stones	14	16
Sand, fine, gray, and clay	2	18
Sand, fine, brown, and clay	2.5	20.5
Sand, fine to medium, brown, and fine gravel	11.1	31.6
Till:		
Sand, fine, brown, and clay, with sharp gravel	8.4	40.0
Refusal		at 40.0
This log is representative of test wells Hamilton 84-87.		
HAMILTON 88. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	2	2
Ice-contact deposits:		
Sand, fine, brown, and clay	28	30
Sand, fine, gray, and clay	19	49
Sand, fine, brown, clay, and sharp gravel	6	55
Sand, fine, gray, sharp gravel, and clay	15.5	70.5
Refusal		at 70.5
HAMILTON 89. Alt. about 40 ft.		
Driller's log of water well.		
Ice-contact deposits:		
Sand, fine, brown, and large stones	13	13
Refusal		at 13
This log is representative of test wells Hamilton 89 and 90.		
HAMILTON 91. Alt. about 40 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine to medium, brown, clay, and gravel	20	20
Sand, fine to medium, brown, and gravel	11	31
Sand, fine to medium, gray, and gravel	5	36
Sand, fine to medium, gray, gravel, with clay	6	42
Sand, fine to medium, gray, and sharp gravel	7.5	49.5
Refusal		at 49.5
HAMILTON 93. Alt. about 40 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine to medium, brown, gravel, and clay	14	14
Sand, fine to medium, gray, gravel, and clay	6.1	20.1
Refusal		at 20.1
This log is representative of test wells Hamilton 92 and 93.		
HAMILTON 94. Alt. about 40 ft.		
Driller's log of test well.		
Outwash:		
Sand, clay, with some gravel	27.8	27.8
Refusal		at 27.8
HAMILTON 95. Alt. about 40 ft.		
Driller's log of test well.		
Outwash:		
Sand, gravel, and clay	20	20
Clay	24.8	44.8
Sand, sharp gravel, and clay.	12.1	56.9
HAMILTON 100. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Soft	4	4
Ice-contact deposits:		
Sand and clay	22.6	26.6
Sand, clay, and sharp gravel	3.4	30.0
Sand and clay	10.2	40.2
Sand, fine, some gravel, and clay	15.1	55.3
Refusal		at 55.3
This log is representative of test wells Hamilton 96, 99-101.		
HAMILTON 102. Alt. about 40 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, medium, and gravel	24.7	24.7
Sand, gravel, some brown, some gray	5.0	29.7
Sand, fine, gray, some sharp gravel and clay	11.4	41.1
HAMILTON 109. Alt. about 40 ft.		
Driller's log of water well.		
Ice-contact deposits:		
Sand, fine to medium, brown, some gray, and gravel	23.2	23.2
Sand, fine to medium, some stones	16.1	39.3
Sand, fine, gray, trace of clay	5.5	44.8
Sand, fine, sharp gravel, and clay	8.7	53.5
Refusal		at 53.5
This log is representative of test wells Hamilton 106-111.		
HAMILTON 112. Alt. about 50 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Gravel, cobbles, and boulders	5	5
Refusal:		
Bedrock or boulder		at 5
HAMILTON 113. Alt. about 65 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine, silty, and very coarse gravel	5.5	5.5
Refusal:		
Cobble or boulder		at 5.5
This log is representative of four holes drilled at this site.		
HAMILTON 114. Alt. about 40 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, very fine to very coarse, some silt, fine gravel, brown	20	20
Sand, very fine to coarse, few very coarse grains; silt, brown	5	25
Sand, mostly very fine to fine, silt, few coarse grains, olive-gray	3	28
Sand, silty, mostly very fine, few coarse grains, some clay, gray	6	34
Till:		
Hard, compact material	4	38
Refusal:		
Bedrock or boulder		at 38
HAMILTON 115. Alt. about 65 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Gravel, coarse, mostly well rounded, some silty sand, some boulders	6	6
Refusal:		
Bedrock or boulder		at 6
HAMILTON 116. Alt. about 45 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Gravel, coarse, well rounded, silty sand, some boulders	16	16
Refusal:		
Bedrock or boulder		at 16
HAMILTON 117. Alt. about 40 ft.		
Geologist's log of auger hole.		
Marine unit:		
Gravel, fine to coarse, and sand, coarse, silty	10	10
Silt, brown, and gravel, fine to coarse	3	13
Silt, somewhat clayey, brown, with some fine gravel, large cobbles and boulders.	8	21
Refusal:		
Bedrock or boulder		at 21
HAMILTON 129. Alt. about 35 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, fine to medium, well sorted, brown	11	11
Clay and silt, brown, with some sand	5	16
Clay and silt, gray-blue	33	49
HAMILTON 130. Alt. about 60 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to medium, angular, brown, some silt, fine gravel, and rounded pebbles.	9	9
Refusal:		
Bedrock or boulder		at 9
HAMILTON 131. Alt. about 80 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, coarse, silty, brown, and gravel, fine to coarse.	6	6
Refusal:		
Bedrock or boulder		at 6
HAMILTON 132. Alt. about 60 ft.		
Geologist's log of auger hole.		
Marine unit:		
Clay and silt, stiff, brown, much sand, some fine gravel	7	7
Sand, brown, silty, and gravel, mostly fine	20	27
Refusal:		
Bedrock or boulder		at 27
HAMILTON 133. Alt. about 50 ft.		
(Original altitude of land surface about 60 feet.)		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to coarse, coarse predominantly, angular, poorly sorted, silt, and gravel, medium, rounded	5	5
Sand, mostly fine to medium, silty, moderately well sorted, brown, with some fine gravel	35	40
Refusal:		
Bedrock or boulder		at 40
Auger hole in pit about 10 feet below original land surface.		
HAMILTON 134. Alt. about 75 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to coarse, silty, brown, and gravel, rounded.	4	4
Refusal:		
Bedrock or boulder		at 4

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
HAMILTON 135. Alt. about 45 ft.		
Geologist's log of auger hole.		
Marine unit and ice-contact deposits, undifferentiated:		
Sand, coarse, angular, somewhat silty; some fine gravel	30	30
Ice-contact deposits:		
Gravel and cobbles	3	33
Refusal:		
Bedrock or boulder		at 33
HAMILTON 136. Alt. about 45 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, coarse, angular, brown, some fine rounded gravel, some silt	10	10
Sand, medium, gray, some fine gravel	10	20
Sand, fine to medium, gray, becoming gray clay and silt toward bottom	40	60
Refusal:		
Bedrock or boulder		at 60
HAMILTON 137. Alt. about 35 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, fine to medium, silty, brown, some fine gravel	7	7
Sand, fine, silty, gray-brown.	8	15
Clay and silt, gray, becoming extremely fine grained and plastic below 20 feet, some sand; very little sand below 40 feet	48	63
Refusal:		
Bedrock or boulder		at 63
HAMILTON 171. Alt. about 45 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, gray, and gravel	13	13
Sand, brown, and gravel	9	22
HAMILTON 172. Alt. about 50 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	4	4
Ice-contact deposits:		
Sand, brown	9	13
Sand, brown, and gravel	6	19
Sand, medium	6	25
Sand and gravel	5	30
Sand, fine, gray	26.5	56.5
HAMILTON 175. Alt. about 30 ft.		
Driller's log of test well.		
Marine unit:		
Clay	14	14
Ice-contact deposits:		
Sand and some clay	5	19
Sand, fine, brown	11	30
Gravel, sharp, gray, sand, and some clay	5.5	35.5
This log is representative of test wells Hamilton 174-176.		
HAMILTON 177. Alt. about 30 ft.		
Driller's log of test well.		
Marine unit:		
Sand, gravel, and clay	9	9
Clay	15	24
Ice-contact deposits:		
Gravel, sharp, and sand, with clay	7	31
HAMILTON 178. Alt. about 80 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sharp gravel	10.5	10.5
HAMILTON 180. Alt. about 55 ft.		
Driller's log of test well.		
Marine unit:		
Clay and some gravel	10	10
Clay	7	17
Ice-contact deposits:		
Gravel, brown, and fine sand..	7	24
This log is representative of test wells Hamilton 179 and 180.		
HAMILTON 182. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	2	2
Outwash and ice-contact deposits, undifferentiated:		
Sand, brown, and gravel, some clay	6	8
Sand and gravel, coarse, sharp, brown	26	34
Sand and gravel, gray	9	43
HAMILTON 183. Alt. about 35 ft.		
Driller's log of test well.		
Outwash and ice-contact deposits, undifferentiated:		
Sand, fine to medium, brown, and large gravel, with clay, changing to gray	22	22
Sand, medium, gray, and large gravel	5.5	27.5
Sand, medium, gray, and broken gravel	6.0	33.5
Sand, fine, gray, and broken gravel with trace of clay..	8.2	41.7
Refusal		at 41.7
HAMILTON 184. Alt. about 35 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	7.5	7.5
Outwash and ice-contact deposits, undifferentiated:		
Sand, medium, brown, and gravel, with trace of clay.	13.5	21
Sand, medium to coarse, brown, and gravel	28	49
Sand, fine to medium, brown, and gravel	5	54
Sand, fine to medium, brown, and gravel, with trace of clay	5.5	59.5
Sand, fine to medium, brown changing to gray, and gravel, with trace of clay.	6.0	65.5
HAMILTON 185. Alt. about 35 ft.		
Driller's log of test well.		
Swamp deposits and fill, undifferentiated:		
Peat, with large rocks	5	5
Outwash and ice-contact deposits, undifferentiated:		
Sand, fine to medium, brown, and gravel	14	19
Sand, fine to medium, brown, and broken gravel	5.5	24.5
Sand, fine to medium, brown, and gravel	5.5	30
Sand, fine to medium, brown, with gravel and some clay..	16	46
Not described	2	48
Refusal		at 48
HAMILTON 200. Alt. about 25 ft.		
Driller's log of test well.		
Swamp deposits:		
Muck	3	3
Marine unit:		
Clay	27	30
Ice-contact deposits?:		
Sand and gravel	10	40
This log is representative of test wells Hamilton 186-204.		
IPSWICH 9. Alt. about 50 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, coarse, and granules, brown	5	5
Sand, coarse, some fine to medium, brown	5	10
Sand, fine, silty, brown	5	15
Sand, very fine, some silt, brown	4	19
Sand, very fine, some silt, gray	27	46
Cobbles and boulders	2	48
Refusal:		
Boulders or bedrock		at 48
IPSWICH 10. Alt. about 30 ft.		
Geologist's log of auger hole.		
Marine unit:		
Clay, olive-tan, and some sand, fine to medium, brown	9	9
Clay, some silt, olive-green.	3	12
Clay, gray	8	20
Till:		
Compact material	4	24
IPSWICH 11. Alt. about 50 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, very fine to fine, some silt, fine gravel	2	2
Clay, olive-green	8	10
Clay, dark green	10	20
Sand, mostly very fine, some fine, well sorted, some silt and clay, brown	5	25
Sand, very fine, silty, brown, some clay	4	29
Silt and very fine sand, some clay; few pebbles	9	38
Refusal:		
Coarse compact material		at 38
IPSWICH 41. Alt. about 40 ft.		
Owner's log of water well.		
Marine unit:		
Sand, brown, and fine gravel.	6	6
Clay, stiff, gray	24	30
Bedrock		at 30
IPSWICH 43. Alt. about 75 ft.		
Owner's log of water well.		
Ice-contact deposits:		
Sand and gravel	3	3
Gravel, hard, blue	7	10
Bedrock:		
Broken slabs	3	13
IPSWICH 47. Alt. about 40 ft.		
Owner's log of water well.		
Marine unit:		
Clay, brown	25	25
Ice-contact deposits:		
Sand and gravel	21	46
IPSWICH 60. Alt. about 10 ft.		
Owner's log of water well.		
Marine unit:		
Clay	25	25
Ice-contact deposits		at 25
IPSWICH 96. Alt. about 8 ft.		
Driller's log of test hole.		
Fill	6	6
Marine unit:		
Silty sand	1	7
Clay, medium, blue	3.5	10.5
Clay, soft, blue	8.0	18.5
Ice-contact deposits:		
Sand, coarse, loose, gray, gravel, little clay	3.5	22
Refusal		at 22
IPSWICH 97. Alt. 8.5 ft.		
Driller's log of test hole		
Fill	4.0	4.0
Ice-contact deposits:		
Sand, coarse, yellow, and gravel	3.0	7.0
Sand, hard, dense, yellow, and gravel	2.0	9.0
IPSWICH 99. Alt. about 9 ft.		
Driller's log of test hole.		
Fill	3.5	3.5
Ice-contact deposits:		
Sand, fine, compact, trace of gravel and boulders	5.0	8.5
Refusal		at 8.5
IPSWICH 102. Alt. about 25 ft.		
Driller's log of test hole.		
Marine unit:		
Loam	1.5	1.5
Sand, medium, yellow	3.5	5.0
Refusal		at 5.0

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
IPSWICH 103. Alt. about 13 ft.		
Driller's log of test hole.		
Marine unit:		
Sandy loam and gravel	2.5	2.5
Sand, fine, yellow, and some clay	4.0	6.5
Till:		
Sand, medium, boulders, clay	1.5	8.0
Refusal	at	8.0
IPSWICH 109. Alt. 0.0 ft.		
Driller's log of test hole.		
Swamp deposits:		
Peat	4	4
Marine unit:		
Clay, stiff, yellow	6	10
Clay, soft, blue	8	18
Ice-contact deposits:		
Sand, hard, coarse, blue, and gravel	6	24
Till:		
Sand, gravel, boulders, coarse, very compact	4	28
Refusal	at	28
IPSWICH 112. Alt. about 9 ft.		
Driller's log of test hole.		
Fill	11	11
Marine unit:		
Clay, medium, yellow	6	17
IPSWICH 113. Alt. about 43 ft.		
Driller's log of test hole.		
Marine unit:		
Loam	2	2
Sand, medium, yellow	3.5	5.5
Clay, medium, yellow, trace of fine sand	7.5	13
Clay, soft, blue	42.5	55.5
Sand, medium, yellow, gravel, and clay	5.5	61
This log is representative of test holes Ipswich 113-116.		
IPSWICH 119. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Clay, blue, and gravel	11	11
Ice-contact deposits:		
Quicksand	19	30
Gravel, firm	5	35
Till:		
Clay, hardpan	at	35
This log is representative of test wells Ipswich 117-120.		
IPSWICH 123. Alt. about 25 ft.		
Driller's log of test well.		
Marine unit:		
Clay, blue	10	10
Quicksand, fine, blue	5	15
Ice-contact deposits:		
Hardpan	1.5	16.5
Gravel, fine	2.0	18.5
Refusal:		
Bedrock	at	18.5
This log is representative of test wells Ipswich 121-123.		
IPSWICH 126. Alt. about 35 ft.		
Driller's log of test hole.		
Marine unit:		
Clay, blue	20	20
Quicksand, blue	9	29
Till:		
Hardpan	1	30
Refusal:		
Bedrock	at	30
This log is representative of test wells Ipswich 124-126.		
IPSWICH 129. Alt. about 30 ft.		
Driller's log of test well.		
Marine unit:		
Clay, yellow	7	7
Clay, blue	5	12
Ice-contact deposits:		
Sand, fine, red	9	21
Sand, very fine, red	7	28
Gravel, coarse	at	28
Gravel, fine, red	5	33
IPSWICH 131. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Blue clay	20	20
Till?:		
Hardpan	at	20
IPSWICH 132. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Clay, blue	26	26
Till?:		
Gravel, compact	7	33
IPSWICH 133. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Clay, blue, mixed with fine sand	30	30
Till?:		
Hardpan	at	30
IPSWICH 157. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Clay	22.5	22.5
Ice-contact deposits:		
Sand, fine, brown, and clay	12.0	34.5
Sand, medium, and small gravel, with clay	19.5	54
Refusal	at	54
IPSWICH 159. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Clay	25	25
Sand and clay	18.2	43.2
Marine unit and ice-contact deposits, undifferentiated:		
Clay, gray, and sharp gravel.	4.8	48
Sand, fine, gray, clay, and some sharp gravel	5.4	53.4
Refusal:		
Ledge	at	53.4
IPSWICH 160. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Sharp gravel, and gray clay	15.3	15.3
Ice-contact deposits:		
Sand, coarse, brown, some sharp gravel, some brown clay	5.1	20.4
Sand, brown, and gravel	5.1	25.5
"Tight, would not pump"	5.2	30.7
Till:		
Hardpan	at	30.7
Refusal	at	30.7
IPSWICH 163. Alt. about 35 ft.		
Driller's log of test well.		
Marine unit:		
Sand, fine to medium, and clay	10	10
Clay	24	34
Sand, fine, brown, and clay	6.5	40.5
Till:		
Hardpan	1.5	42
Refusal	at	42
IPSWICH 164. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
"Topsoil"	2	2
Hardpan, gravel	10	12
Clay	19	31
Refusal	at	31
IPSWICH 165. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
"Topsoil"	2	2
Ice-contact deposits:		
Sand and gravel	12	14
Marine unit:		
Clay	39	53
Till?:		
Hardpan	at	53
Refusal	at	53
IPSWICH 166. Alt. about 30 ft.		
Driller's log of test well.		
Marine unit and ice-contact deposits, undifferentiated:		
Gravel, with gray clay	14.5	14.5
Sand, medium, brown and gray, with clay	5.5	20.0
Sand, medium, gray, and clay.	5.5	25.5
Refusal:		
Ledge	at	25.5
IPSWICH 168. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Gray clay	12.1	12.1
Ice-contact deposits?:		
Hardpan	at	12.1
Refusal	at	12.1
IPSWICH 169. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Clay	6	6
Marine unit and ice-contact deposits, undifferentiated:		
Broken stone and gray clay	6.1	12.1
Gravel, gray, sharp, and gray clay	5.2	17.3
Ice-contact deposits:		
Sharp gray gravel	5.7	23.0
Not described (till?):		
"Weight and pipe bouncing at 25 feet"	5.1	28.1
Refusal:		
Bedrock	at	28.1
IPSWICH 170. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Sand, fine	12.3	12.3
Sand, fine, brown, and clay	5.1	17.4
Ice-contact deposits and marine unit, undifferentiated:		
Gravel, sharp, gray, with fine sand and clay	5.6	23.0
Ice-contact deposits:		
Gravel, sharp, gray, fine sand	5.2	28.2
Not reported	5.1	33.3
Refusal:		
Ledge	at	33.3
IPSWICH 174. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Sand and clay	13.8	13.8
Ice-contact deposits and marine unit, undifferentiated:		
Sharp gravel, with fine sand and clay	5.5	19.3
Sand, fine, brown, and clay	5.2	24.5
Sand, medium, brown, sharp gravel, and clay	5.5	30.0
Not reported	5.3	35.3
Refusal	at	35.3
IPSWICH 175. Alt. about 20 ft.		
Driller's log of test well.		
Marine unit:		
Sand, brown, and gravel	13.7	13.7
Clay, gray, and sharp gravel.	5.5	19.2
Ice-contact deposits:		
Gravel, medium, sharp, gray, and gray clay	5.5	24.7
Not reported	0.3	25.0
Refusal:		
Hardpan	at	25.0
IPSWICH 176. Alt. about 25 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sharp gravel and traces of clay	42.1	42.1
Refusal	at	42.1
IPSWICH 179. Alt. about 20 ft.		
Driller's log of test well.		
Outwash:		
Not reported	19.6	19.6
Sharp stones, clay	5.7	25.3
Clay and fine sand	10.5	35.8
Sand, brown, and clay	5.0	40.8
Refusal	at	40.8

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
IPSWICH 180. Alt. about 20 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Gravel, trace of clay, compact	14	14
Gravel, compact	5.7	19.7
Gravel and clay	2.8	22.5
Refusal		at 22.5
IPSWICH 181. Alt. about 25 ft.		
Driller's log of test well.		
Outwash:		
Sand, fine, some gravel, traces of clay	35.4	35.4
Gravel, some sand, traces of clay	21.4	56.8
Refusal		at 56.8
This log is representative of test wells Ipswich 181 and 182.		
IPSWICH 183. Alt. about 15 ft.		
Driller's log of test well.		
Marine unit:		
Clay, some gravel	19.5	19.5
Clay	16.6	36.1
Clay, some sand	5.4	41.5
Clay, some gravel	14.7	56.2
Refusal:		
Ledge		at 56.2
IPSWICH 188. Alt. about 20 ft.		
Driller's log of test well.		
Outwash:		
Not reported	14.9	14.9
Gravel, fine sand, and clay	5.1	20
Sharp stones, sand, brown, and clay	6.5	26.5
Sharp stones, fine sand	5.0	31.5
Refusal:		
Ledge		at 31.5
This log is representative of test wells Ipswich 187 and 188.		
Ipswich 189. Alt. about 25 ft.		
Driller's log of test well.		
Swamp deposits?:		
Not reported	14.9	14.9
Marine unit:		
Clay, fine sand	5.1	20
Sand, fine, trace of clay	12.5	32.5
Gravel, fine sand, trace of clay	5.2	37.7
Fine sand, clay	22.1	59.8
Ice-contact deposits:		
Fine sand, sharp stones, some gravel	5.5	65.3
Refusal:		
Ledge		at 65.3
IPSWICH 190. Alt. about 30 ft.		
Driller's log of test well.		
Marine unit:		
Clay, fine sand	20.2	20.2
Clay	17.3	37.5
Gravel, fine sand, and clay	20.6	58.1
Refusal:		
Ledge		at 58.1
IPSWICH 192. Alt. about 60 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Not reported	13.1	13.1
Gravel, gray, and fine sand	21.7	34.8
Sharp gravel, fine mud, clay	5.2	40
Clay, fine sand, sharp stones	5.2	45.2
Refusal:		
Ledge		at 45.2
IPSWICH 194. Alt. about 80 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Not reported	12.6	12.6
Sand, fine, trace of clay	36.6	49.2
Sand, gray, trace of clay	10.5	59.7
Sharp gravel, trace of clay	5.1	64.8
Sharp stones	5.2	70.0
Refusal:		
Ledge		at 70.0
IPSWICH 197. Alt. about 70 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, brown, some clay	37.4	37.4
Sand, gray, trace of clay	15.8	53.2
Sand, fine, and clay	5.0	58.2
IPSWICH 197.--Continued		
Ice-contact deposits:--Continued		
Clay, gravel, fine sand	5.5	63.7
Sharp gravel, trace of clay	5.5	69.2
Till:		
Ledge or hardpan	2.0	71.2
Refusal:		
Ledge or hardpan		at 71.2
IPSWICH 201. Alt. about 70 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Gravel and fine sand	26.3	26.3
Gravel, fine sand, trace of clay	5.5	31.8
Refusal		at 31.8
This log is representative of test wells Ipswich 201 and 202.		
IPSWICH 218. Alt. about 15 ft.		
Driller's log of test hole.		
Fill:		
Sand, gravel, and boulders	6	6
Marine unit:		
Clay, medium, yellow, strata of fine sand	2	8
Ice-contact deposits:		
Sand, fine, hard, and gravel, with little blue clay	5	13
Till:		
Sand, hard, gravel, little clay, boulders, hardpan	8	21
This log is representative of test holes Ipswich 212-222.		
IPSWICH 235. Alt. about 45 ft.		
Driller's log of test hole.		
Marine unit:		
Loamy sand, little coarse gravel	2.5	2.5
Sand, coarse, yellow	11.5	14.0
Sand, coarse, and gravel	1.5	15.5
Clay, soft, blue	38.8	54.3
Till:		
Sand, coarse, hard, gravel, coarse, and clay	5.7	60.0
This log is representative of test holes Ipswich 233-236.		
IPSWICH 239. Alt. about 5 ft.		
Driller's log of test hole.		
Swamp deposits:		
Peat	4.0	4.0
Marine unit:		
Clay, stiff, yellow	7.5	11.5
Clay, soft, blue	10.5	22.0
Ice-contact deposits:		
Sand, coarse, hard, blue, gravel, and boulders	3.5	25.5
Till:		
Sand, medium, yellow, gravel, and boulders, very compact	3.5	29.0
Refusal		at 29.0
This log is representative of test holes Ipswich 237-240.		
IPSWICH 272. Alt. 21.5 ft.		
Driller's log of test hole.		
Fill:		
Loose sand and gravel	3.5	3.5
Marine unit:		
Clay, medium, yellow, little sand and gravel	3.5	7.0
Ice-contact deposits:		
Sand, coarse, yellow, and gravel	1.5	8.5
Sand, coarse, hard, yellow, and gravel	4.5	13.0
Sand, coarse, gray, and gravel	1.5	14.5
IPSWICH 276. Alt. 26 ft.		
Driller's log of test hole.		
Fill:		
Loose, dirty sand and gravel	7.5	7.5
Marine unit:		
Sand, coarse, yellow, little gravel	2.0	9.5
Clay, hard, yellow, and little sand	4.5	14.0
Clay, medium, yellow	5.5	19.5
Clay, soft, blue	4.5	24.0
Refusal		at 24.0
IPSWICH 279. Alt. 27 ft.		
Driller's log of test hole.		
Fill:		
Loose, dirty, yellow sand and gravel	4.0	4.0
Till:		
Hard, coarse, yellow sand, and gravel	3.5	7.5
Refusal		at 7.5
This log is representative of test holes Ipswich 278-280.		
IPSWICH 285. Alt. 23 ft.		
Driller's log of test hole.		
Fill:		
Firm, dirty sand and gravel	5.0	5.0
Marine unit:		
Clay, hard, yellow, and little sand	3.5	8.5
Clay, medium, yellow	5.5	14.0
IPSWICH 287. Alt. 27 ft.		
Driller's log of test hole.		
Fill:		
Coarse sand, gravel, and boulders	4.5	4.5
Marine unit:		
Sand, coarse, yellow	0.5	5.0
Clay, hard, yellow, and fine sand	2.5	7.5
Clay, medium, blue	2.5	10.0
IPSWICH 288. Alt. 28 ft.		
Driller's log of test hole.		
Fill:		
Road metal	1.0	1.0
Hard, dirty sand, gravel and boulders	7.0	8.0
Marine unit:		
Clay, medium, yellow, and fine sand	4.5	12.5
Clay, medium, yellow, with veins of yellow sand	5.5	18.0
Ice-contact deposits:		
Sand, hard, coarse, gray, gravel, and boulders	3.0	21.0
IPSWICH 289. Alt. 17 ft.		
Driller's log of test hole.		
Marine unit and ice-contact deposits (?), undifferentiated:		
Loamy sand	2.5	2.5
Sand, firm, coarse, yellow, and gravel	1.5	4.0
Sand, cemented, hard, yellow, gravel, and boulders	3.5	7.5
Sand, coarse, hard, yellow, gravel, and boulders	5.5	13.0
Sand, cemented, yellow, gravel, and boulders	7.0	20.0
IPSWICH 290. Alt. about 70 ft. (Original altitude about 80 feet.) Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, very fine to fine, brown	28	28
Till?:		
Rocks and fine sand, brown to olive-brown	5	33
Refusal:		
Bedrock or boulder		at 33
Auger hole in pit about ten feet below original land surface.		
IPSWICH 293. Alt. about 20 ft.		
Geologist's log of auger hole.		
Marine unit:		
Clay, oxidized, tough, olive-green	25	25
Clay, light gray	1	26
Clay, occasional pebbles, tough, gray	5	31
Refusal:		
Till?		at 31

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
IPSWICH 294. Alt. about 10 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to very coarse, silt, gravel, fine to coarse, containing angular to subrounded pebbles.....	5	5
Sand, fine to very coarse; gravel, fine to medium, few small pebbles, some silt; grades downward to fine to medium sand, silty, with fine gravel.....	6	11
Refusal:		
Till.....		at 11
IPSWICH 295. Alt. about 50 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, medium to very coarse, mostly angular with some subangular to subrounded grains, little silt; fine to medium pebbles, gravel...	8	8
Sand and gravel, compact.....	1	9
Refusal.....		at 9
IPSWICH 296. Alt. about 30 ft.		
Geologist's log of auger hole.		
Marine unit:		
Clay, silty, olive-brown.....	13	13
Refusal:		
Bedrock or boulder.....		at 13
IPSWICH 297. Alt. about 30 ft.		
Geologist's log of auger hole.		
Till.....	5	5
Refusal:		
Rock.....		at 5
IPSWICH 299. Alt. about 30 ft.		
Geologist's log of auger hole.		
Marine unit:		
Clayey silt, hard, moist, some minor sand in lenses, brown.....	15	15
Clayey silt, becoming plastic, saturated, brown.....	10	25
Rock fragments in brown clayey silt.....	2	27
Refusal:		
Bedrock or boulder.....		at 27
IPSWICH 301. Alt. about 9 ft.		
Geologist's log of auger hole.		
Marine unit:		
Clayey silt, brown, moist, containing sandy and silty lenses.....	7	7
Gravel, with clay and silt, brown; gravel consists of fine to coarse angular to subangular fragments.....	5	12
Clayey silt, brown, with thin gravel lenses.....	1	13
Ice-contact deposits:		
Sand, fine to coarse, and gravel, with much silt.....	2	15
Till:		
Gravel, silt, clay, very dense	1	16
IPSWICH 303. Alt. about 5 ft.		
Geologist's log of auger hole.		
Marine unit:		
Clayey silt, moist, dark brown, sand, becoming more saturated with depth.....	21	21
Clayey silt, plastic, light brown, changing to gray.....	9	30
Clayey silt, gray, plastic. Struck rock at 73 feet.....	47	77
Refusal:		
Bedrock or boulder.....		at 77
IPSWICH 304. Alt. about 20 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, predominantly fine, and gravel, fine, brown, with silt.....	15	15
Sand, predominantly coarse, and fine to medium gravel...	5	20
IPSWICH 304.--Continued		
Marine unit:--Continued		
Clayey silt, stiff, moist, brown, with sand and gravel	7	27
Clayey silt, brown, some minor sand.....	5	32
Clayey silt, saturated, plastic, light brown, becoming sandy and gravelly with depth.....	10	42
Ice-contact deposits?:		
Dense gravelly stratum.....		at 42
IPSWICH 307. Alt. about 30 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, coarse, with much silt, brown, some fine gravel....	5	5
Clayey silt, moist, brown, with disseminated silt and fine sand, also some lenses of fine granular material..	7	12
Clayey silt, saturated, brown	14	26
Till:		
Gravelly, bouldery material, dense, hard drilling.....	2	28
Refusal:		
Bedrock or boulder.....		at 28
IPSWICH 308. Alt. about 30 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, poorly sorted, with much silt and gravel.....	5	5
Refusal:		
Boulder or bedrock.....		at 5
This log is representative of two borings at this site.		
IPSWICH 314. Alt. about 6 ft.		
Geologist's log of auger hole.		
Marine unit:		
Clayey silt, brown, becoming saturated with depth.....	15	15
Clayey silt, saturated, plastic, gray, with lenses of silt.....	20	35
Refusal:		
Till.....		at 35
IPSWICH 319. Alt. about 30 ft.		
(Original altitude of land surface about 40 feet.)		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, coarse, brown, with fine to medium gravel.....	22	22
Cobbles and boulders.....	1	23
Refusal:		
Bedrock or boulder.....		at 23
Auger hole in pit about ten feet below original land surface.		
IPSWICH 321. Alt. about 15 ft.		
Driller's log of test hole.		
Swamp deposits:		
Soft peat and stones.....	3.0	3.0
Ice-contact deposits:		
Sand, medium, and gravel, hard.....	3.5	6.5
Sand, fine, hard, brown, gravel, and boulders.....	4.5	11.0
Refusal.....		at 11.0
IPSWICH 322. Alt. about 15 ft.		
Driller's log of test hole.		
Ice-contact deposits:		
Loam, sand, gravel, and boulders.....	3.5	3.5
Sand, fine, yellow, hard, gravel, and stones.....	3.5	7.0
Sand, medium, hard, gravel, and boulders.....	4.5	11.5
Refusal.....		at 11.5
MIDDLETON 58. Alt. about 55 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, medium to very coarse, brown; gravel, fine to medium, some coarse; few cobbles; some silt, stratified gravel.....	17.5	17.5
Refusal:		
Boulder.....		at 17.5
MIDDLETON 59. Alt. about 75 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium to coarse, brown; silt; gravel, very fine to coarse, mostly medium to coarse.....	6.0	6.0
Refusal:		
Boulder.....		at 6.0
MIDDLETON 60. Alt. about 50 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, some silt, brown.....	3	3
Sand, pebble and cobble gravel.....	2	5
Sand, silty, fine to medium, few coarse sand grains, dark brown.....	5	10
Sand, fine to coarse, some silt, tan to brown.....	23	33
Sand, fine, gray; some silt and clay.....	7	40
Sand, very fine to fine, gray; silt; clay.....	18.5	58.5
Ice-contact deposits?:		
Sand, silt, clay, some pebbles; few hard layers...	24.5	83
Refusal.....		at 83
MIDDLETON 61. Alt. about 50 ft.		
Geologist's log of auger hole.		
Fill:		
Cobbles, pebbles, sand.....	8	8
Swamp deposits:		
Peat and organic muck, black.	2.5	10.5
Till?:		
Sand, gravel, clay, and silt.	0.5	11
Refusal:		
Bedrock or boulder.....		at 11
MIDDLETON 62. Alt. about 50 ft.		
Geologist's log of auger hole.		
Fill:		
Cobbles, pebbles, sand.....	7	7
Sand, silt, pebbles, dark brown, some organic material.....	3	10
Outwash:		
Sand, silt, organic material, brown.....	22	32
Refusal:		
Bedrock or boulder.....		at 32
MIDDLETON 63. Alt. about 50 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine, some medium, some silt, some very coarse grains, dark brown.....	10	10
Sand, silty, mostly fine, brown.....	5	15
Sand, fine, some medium, silty, few very coarse grains, brown.....	7.5	22.5
Sand, fine to medium, gray, silty, and clay.....	46.5	69
Ice-contact deposits:		
Pebbles and cobbles, compact, dense.....	2	71
MIDDLETON 64. Alt. about 50 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine, some very fine and medium, tan.....	12	12
Sand, fine, some medium, some silt, brown.....	3	15
Sand, very fine to fine, silty, few medium grains, olive-tan.....	10	25
Sand, very fine, silt, and some clay, olive-tan.....	10	35
Till:		
Compact material.....	1	36
Refusal.....		at 36

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
MIDDLETON 65. Alt. about 40 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, silty, dark brown	5	5
Clay, silty, olive-tan	2	7
Hard layer		at 7
Sand, very fine, some organic material, and silt, dark gray	3	10
Sand, mostly fine, some medium and very coarse, some silt, dark gray, some fine to medium gravel	8	18
Sand, fine to coarse; gravel, fine, loose, light olive-gray	2	20
Sand, very fine to fine, some medium, few coarse grains, loose, gray; little silt	39	59
Till:		
Hard compact layer	4	63
Refusal		at 63
MIDDLETON 86. Alt. 32.0 ft.		
Driller's log of test hole.		
Outwash:		
Silt	4	4
Sand, medium, silty	15	19
Sand, fine, hard, gravel, and stones	3.5	22.5
Refusal:		
Rock or boulder		at 22.5
This log is representative of test holes Middleton 85 and 86.		
MIDDLETON 87. Alt. 33.2 ft.		
Driller's log of test hole.		
Outwash:		
Sand and gravel, loose	15.3	15.3
Till:		
Sand, gravel, rocks and clay, compact	5.9	21.2
Refusal:		
Rock obstruction		at 21.2
This log is representative of test holes Middleton 87-90 and Boxford 217-222.		
MIDDLETON 91. Alt. about 110 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, mostly medium to coarse, some very coarse, brown; gravel, very fine to fine, some medium	22	22
Sand, very fine to fine, some medium, some silt, gray	19	41
Till?:		
Sand, very fine, silty, some gravel, dense, gray	2	43
Refusal:		
Boulder or bedrock		at 43
MIDDLETON 95. Alt. about 50 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Gravel, coarse	15	15
Sand, fine	5	20
Gravel, fine, and sand, brown	7	27
Sand, fine, brown	12	39
Sand, fine, brown, some clay	7	46
Gravel, coarse, brown	6	52
Till	2	54
Refusal		at 54
MIDDLETON 101. Alt. about 45 ft.		
Driller's log of test well.		
Outwash:		
Gravel and stone	19	19
Sand, coarse, and gravel	7	26
Sand, brown, and gravel	4½	30½
Sand, brown	6	36½
Sand, brown, some gray	5	41½
Sand, brown and gray, some clay	5	46½
Clay and sand, gray	5	51½
Clay	5	56½
Clay, some brown gravel	7	63½

	Thickness	Depth
MIDDLETON 107. Alt. about 50 ft.		
Driller's log of test well.		
Outwash:		
Sand, sharp, brown, and gravel, some clay	13.7	13.7
Sand and gravel, red, with some clay	5.0	18.7
Till:		
Brown gravel, sand, and clay, hardpan	2.6	21.3
Refusal:		
Ledge		at 21.3
MIDDLETON 108. Alt. about 45 ft.		
Driller's log of test well.		
Swamp deposits?:		
Not described	18.7	18.7
Ice-contact deposits:		
Gravel and gray clay	5.1	23.8
Gravel, sand, some clay	4.9	28.7
Gravel and sand, brown	10.0	38.7
Gravel, sand, dark brown, with some clay	5.0	43.7
Sand and gravel, reddish, with little clay	10.0	53.7
Gravel and sand, red, with clay	5.0	58.7
Refusal		at 58.7
MIDDLETON 114. Alt. about 50 ft.		
Driller's log of test well.		
Outwash:		
Sand and gravel, coarse, brown	19	19
Sand and gravel, brown	6	25
Sand and gravel, coarse, brown	5.7	30.7
Clay	5.0	35.7
Not described	7.6	43.3
MIDDLETON 116. Alt. about 50 ft.		
Driller's log of test well.		
Outwash:		
Clay, gray, sand, fine, and broken stone	16.5	16.5
Sand, fine, gray, and clay	34.3	50.8
Till:		
Sand and gravel, brown, stone, and clay	8.2	59.0
Refusal		at 59.0
MIDDLETON 119. Alt. about 50 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine, some coarse, brown, and clay	17	17
Sand, fine, brown, and clay	5.2	22.2
Sand, fine, brown	5.0	27.2
Sand, fine, brown, with trace of clay	5.0	32.2
Sand, fine, brown, and clay	10.1	42.3
Sand, fine, some coarse, brown, and clay	5.0	47.3
Sand, fine, brown, and gray clay	5.0	52.3
Clay, gray, and fine sand	15.0	67.3
Clay, gray, brown sand, and gravel	5.5	72.8
Sand and gravel, brown, with traces of gray clay	6.0	78.8
Refusal		at 78.8
NORTH ANDOVER 155. Alt. about 120 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, very fine to coarse, pebbles	10	10
Sand, coarse to very coarse, granules, some pebbles	3½	13½
Refusal		at 13½
NORTH ANDOVER 156. Alt. about 205 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, very fine to fine, some medium, brown; gravel, very fine to medium, brown	5	5
Refusal:		
Boulder		at 5

	Thickness	Depth
NORTH ANDOVER 157. Alt. about 250 ft.		
Geologist's log of auger hole.		
Till:		
Sand, very fine to fine, some medium, with very fine gravel, few medium gravel particles, olive-brown; clay; silt; few small cobbles	18	18
Refusal		at 18
NORTH ANDOVER 158. Alt. about 235 ft.		
Geologist's log of auger hole.		
Fill:		
Sand, gravel, silt	7	7
Outwash:		
Sand, fine to medium, gray, with trace of silt	3	10
Sand, very fine to fine, gray	8	18
Sand and gravel, some cobbles	5	23
Till:		
Gray-green, very tough	9½	32½
Refusal		at 32½
NORTH ANDOVER 159. Alt. about 155 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, medium, some fine, some very coarse, few cobbles; gravel, very fine to medium, brown	5	5
Refusal:		
Boulder		at 5
NORTH ANDOVER 160. Alt. about 195 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, mostly medium to coarse, some fine, brown; gravel, very fine to fine, brown	9	9
Sand, mostly medium, some coarse, brown	6	15
Sand, mostly fine to medium, some coarse, brown	28	43
Sand and gravel	7	50
Gravel, coarse, and cobbles	8	58
Refusal:		
Cobbles or boulders		at 58
NORTH ANDOVER 161. Alt. about 200 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium to coarse, brown; gravel, mostly fine to medium, some very fine to coarse; some silt	12	12
Gravel, medium to coarse; some brown silt and clay	3	15
Sand and gravel	3	18
Gravel, medium to very coarse, brown, some silt, difficult drilling	3	21
NORTH ANDOVER 162. Alt. about 140 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, very fine to coarse; few boulders and pebbles; silt, olive-brown; cobbles at 10 feet	10	10
Layer of dark gray to black silt with some organic matter		at 10
Till:		
Sand, very fine to coarse, olive-brown; gravel, very fine to coarse; clayey; numerous small cobbles	3	13
Sand, very fine to medium, micaceous, gray; clay; few very fine gravel particles; tight		at 13

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
NORTH ANDOVER 163. Alt. about 135 ft.		
Geologist's log of auger hole.		
Fill:		
Sand, gravel, medium to coarse, few cobbles	2	2
Outwash and till, undifferentiated:		
Sand, very fine to fine, some medium grains, angular, olive-brown, gravel, very fine to fine, clay, silt; hard layer at 13 feet	11	13
Sand, fine to very fine, angular, olive-brown, clay, silt; hard layer at 15 feet.	2	15
Refusal		at 15
NORTH ANDOVER 164. Alt. about 125 ft.		
Geologist's log of auger hole.		
Outwash:		
Topsoil	1	1
Sand, fine to medium some coarse, brown	14	15
Sand, very fine to medium, few coarse grains, light brown	13	28
Sand, fine to coarse, some very fine and very coarse, light brown, few cobbles at 40 feet; possibly till contact	18	46
Till	4	50
Refusal		at 50
NORTH ANDOVER 165. Alt. about 105 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, mostly medium to coarse, some fine and very coarse, gravel, very fine to fine, brown	5	5
Sand, very fine to fine, some medium, some silt, trace of clay, brown	1	6
Sand, very fine to medium, few coarse grains, silt, trace of clay, brown	4	10
Sand, very fine, some medium and very coarse grains, silt, brown	5	15
Sand, very fine, to fine, some medium, silt, brown	5	20
Sand	58	78
Refusal:		
Gravel and rock fragments		at 78
NORTH ANDOVER 166. Alt. about 130 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium to coarse, some fine, subangular, brown, trace of silt, gravel, very fine to fine, some medium	11	11
Refusal:		
Boulder or bedrock		at 11
NORTH ANDOVER 169. Alt. about 160 ft.		
Geologist's log of auger hole.		
Till:		
Sand, fine to medium, brown, with some fine gravel	9	9
Refusal		at 9
NORTH ANDOVER 170. Alt. about 130 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, angular, brown, some fine gravel	10	10
Sand, fine, gray, saturated	10	20
Sand, fine, gray, coarse gravel or rocks	3	23
Refusal		at 23
PEABODY 50. Alt. about 130 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, very fine to fine, some medium, brown; gravel, mostly fine, some medium, some coarse, brown	5	5
Sand, medium to coarse, brown, and gravel, mostly medium, some coarse fragments	2½	7½
PEABODY 50.--Continued		
Refusal:		
Large cobble or boulder		at 7½
PEABODY 51. Alt. about 110 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, very fine to coarse, with some silt; gravel, very fine to coarse, brown, small cobbles	5	5
Refusal:		
Small cobbles and boulders		at 5
PEABODY 52. Alt. about 50 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium to very coarse, brown, silt, brown, and gravel, very fine to very coarse, brown	7	7
Sand, medium to very coarse, and silt, brown	3	10
Sand, very fine to fine, some very coarse, silty, gray	10	20
Sand, very fine to fine, gray, with trace of silt	5	25
Sand, very fine to fine, brown	5	30
Sand, mostly medium, some fine to very fine, few very coarse grains, brown, few dark angular rock fragments	5	35
Refusal:		
Bedrock or boulder		at 35
PEABODY 53. Alt. about 60 ft.		
Geologist's log of auger hole.		
Fill:		
Sand and gravel	5	5
Sand and gravel, and organic matter	0.5	5.5
Outwash:		
Sand, medium to coarse, some fine, mostly angular, brown; some silt; gravel, very fine, brown	8.5	14
Sand, medium to very coarse, dark brown; some silt	7	21
Sand, mostly coarse to very coarse, silty, brown	5	26
Till:		
Sand, very fine to very coarse, angular rock fragments, silt, and clay, gray	1	27
Refusal		at 27
PEABODY 58. Alt. 38.6 ft.		
Driller's log of test hole.		
Ice-contact deposits:		
Dirty sand and gravel, loose, coarse	4	4
Till:		
Sand, gravel, clay, and boulders; coarse, hard	3.5	7.5
Refusal		at 7.5
This log is representative of test holes Peabody 57 and 58.		
PEABODY 99. Alt. about 110 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Clay and fine sand	16.8	16.8
Gravel, medium, and clay	10.5	27.3
Sand, coarse, with clay, hardpan	9.1	36.4
PEABODY 100. Alt. about 100 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine, with clay	10.5	10.5
Gravel, fine, with clay, hardpan	20.0	30.5
PEABODY 101. Alt. about 50 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Loam, fine sand	11.8	11.8
Gravel, medium, with some fine sand	10.5	22.3
PEABODY 101.--Continued		
Ice-contact deposits:--Continued		
Gravel, fine to medium, with little fine sand	30.8	53.1
Till?:		
Hardpan		at 53.1
Refusal		at 53.1
PEABODY 103. Alt. about 60 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Loam, fine sand and gravel	10.5	10.5
Gravel, coarse	5.8	16.3
Clay, yellow, and gravel	3.9	20.2
Till?:		
Hardpan		at 20.2
Refusal		at 20.2
PEABODY 104. Alt. about 50 ft.		
Driller's log of test well.		
Outwash and till, undifferentiated:		
Hardpan	13.2	13.2
Refusal:		
Bedrock?		at 13.2
This log is representative of test wells Peabody 104 and 105.		
PEABODY 106. Alt. about 50 ft.		
Driller's log of test well.		
Swamp deposits:		
Loam and peat	10.3	10.3
Outwash:		
Sand, fine	5.5	15.8
Gravel, fine	10.4	26.2
Till?:		
Hardpan		at 26.2
Refusal		at 26.2
PEABODY 107. Alt. about 50 ft.		
Driller's log of test well.		
Outwash	2.6	2.6
Refusal:		
Bedrock		at 2.6
This log is representative of test wells Peabody 107 and 108.		
PEABODY 109. Alt. about 70 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand and gravel, medium	15.4	15.4
Gravel, medium to coarse, gray	5.6	21.0
Gravel, medium to coarse, brown	10.9	31.9
Gravel, medium to coarse, gray	16.1	48.0
Till?:		
Hardpan		at 48.0
Refusal		at 48.0
PEABODY 112. Alt. about 100 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Loam	1	1
Sand and gravel	1	2
Till?:		
Hardpan	15.3	17.3
Refusal		at 17.3
This log is representative of test wells Peabody 111 and 112.		
PEABODY 113. Alt. about 130 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, medium, and gravel	23.8	23.8
Refusal		at 23.8
PEABODY 114. Alt. 60.2 ft.		
Driller's log of test well.		
Outwash:		
Sand and gravel, coarse, with boulders	12	12
Sand, coarse, and gravel	24.4	36.4
Sand, coarse, and gravel, medium	12.6	49
Sand, coarse, and gravel, with some clay	10	59

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
PEABODY 116. Alt about 50 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	8	8
Outwash?:		
Sand, coarse, and gravel	24.8	32.8
Refusal		at 32.8
PEABODY 117. Alt. about 50 ft.		
Driller's log of test well.		
Outwash:		
Sand and gravel, coarse	5	5
Sand, coarse, and gravel, with clay	5	10
Sand, coarse, and gravel	18.2	28.2
PEABODY 118. Alt. about 60 ft.		
Driller's log of test well.		
Topsoil	2	2
Ice-contact deposits?:		
Sand, medium, and gravel	13.5	15.5
Sand, medium, and gravel, fine	14.8	30.3
Sand and gravel, coarse	24.2	54.5
ROWLEY 54. Alt. about 70 ft.		
Driller's log of test well.		
Outwash:		
Loam	1.9	1.9
Sand, gravel, and clay, gray	19.0	20.9
Refusal		at 20.9
ROWLEY 55. Alt. about 70 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Loam	1.2	1.2
Sand, medium, gray and brown, and coarse gravel	9.1	10.3
Sand, medium, brown, and coarse gravel	11.0	21.3
Sand, fine, and gravel, coarse; some gray clay	5.5	26.8
TOPSFIELD 6. Alt. about 50 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium to coarse, well sorted, brown	4	4
Sand, very fine, well sorted, gray	2	6
Sand, very fine to fine, well sorted, some silt, brown	28	34
Till	1	35
Refusal		at 35
TOPSFIELD 7. Alt. about 40 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium to coarse, brown, some gravel	20	20
Sand, coarse to very coarse, brown	5	25
Sand, medium to coarse, brown	5	30
Sand, fine to medium, brown	12	42
Sand, fine to medium; gray clay apparently at bottom of hole	26	68
Refusal:		
Till		at 68
TOPSFIELD 8. Alt. about 65 ft. (Original altitude of land surface about 90 feet.)		
Geologist's log of auger hole.		
Outwash:		
Sand, coarse to very coarse, well sorted, brown	22	22
Till:		
Gravel, dense, hard drilling	2	24
Refusal		at 24
Auger hole in pit about 25 feet below original land surface.		
TOPSFIELD 10. Alt. about 60 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to coarse, some gravel	6	6
Sand, fine to medium, well sorted	8	14
Sand, very fine to medium, well sorted	11	25
Hard layer		at 25
TOPSFIELD 10.--Continued		
Outwash:--Continued		
Rocks		at 37
Sand, very fine, and silt	15	40
Refusal		at 40
TOPSFIELD 13. Alt. about 70 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to coarse, well sorted, pebbles, some cobbles, brown	7	7
Refusal:		
Probably boulder		at 7
This log is representative of two borings at this site.		
TOPSFIELD 14. Alt. about 30 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium, brown	4	4
Gravel and sand	3	7
Refusal:		
Boulder		at 7
This log is representative of two borings at this site.		
TOPSFIELD 15. Alt. about 40 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, some gravel	5	5
Refusal		at 5
TOPSFIELD 16. Alt. about 50 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium, and gravel	7	7
Refusal:		
Probably boulder		at 7
This log is representative of two borings at this site.		
TOPSFIELD 18. Alt. about 50 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand and gravel, poorly sorted, silty, brown	8	8
Gravel, poorly sorted, silty, dense	4	12
Sand, poorly sorted, silty, and gravel, fine to medium.	2	14
Refusal:		
Boulder or bedrock		at 14
TOPSFIELD 19. Alt. about 45 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand and gravel, fine to coarse, poorly sorted, silty	9	9
Refusal:		
Bedrock or boulder		at 9
TOPSFIELD 20. Alt. about 70 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, medium, silt, some fine gravel	5	5
Sand, fine to coarse, silt, brown, with very little gravel	12	17
Sand, silty, becoming finer with depth, brown	37	54
Refusal:		
Boulder?		at 54
TOPSFIELD 21. Alt. about 40 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, coarse, poorly sorted, silty, brown, with coarse gravel and cobbles	10	10
Refusal:		
Boulder?		at 10
TOPSFIELD 22. Alt. about 45 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to medium, brown	40	40
Sand, fine to medium, becoming very fine with depth, gray	46	86
TOPSFIELD 22.--Continued		
Till:		
Hard layer, silty, red	4	90
Bedrock		at 90
TOPSFIELD 43. Alt. about 55 ft.		
Driller's log of public-supply well.		
Ice-contact deposits:		
Sand, fine to coarse	24	24
Sand and gravel, coarse	12.8	36.8
This log is representative of wells Topsfield 43-46.		
TOPSFIELD 103. Alt. 34.2 ft.		
Driller's log of test hole.		
Fill:		
Loose sand and gravel	4.0	4.0
Outwash:		
Sand, coarse, loose, little gravel	5.0	9.0
Sand, fine, firm	8.5	17.5
Till?:		
Sand, fine, gravel, stones, with some clay; hard	5.5	23.0
This log is representative of test holes Topsfield 101-104.		
WENHAM 16. Alt. about 35 ft.		
Geologist's log of observation well.		
Swamp deposits:		
Silty muck and organic material, dark brown	6	6
Fibrous peat, firm, moderately dry	8	14
Outwash:		
Sand, fine, gray	6.1	20.1
WENHAM 30. Alt. about 50 ft.		
Driller's log of water well.		
Ice-contact deposits:		
Sand, fine to coarse, poorly sorted, silty	5	5
Silty sand and gravel, dense.	20	25
Sand and gravel	7	32
WENHAM 38. Alt. about 50 ft.		
Owner's log of water well.		
Marine unit:		
Clay	10	10
Till	70	80
Bedrock:		
Soft, red	120	200
"Blue granite"	187	387
WENHAM 52. Alt. 63.0 ft.		
Driller's log of test hole.		
Fill:		
Sand, gravel, and stone	3.8	3.8
Ice-contact deposits:		
Sand, medium, and gravel, fine	3.7	7.5
Sand, fine	2.5	10.0
Sand, fine, hard	2.0	12.0
Sand and gravel	0.8	12.8
Refusal:		
Ledge or boulder		at 12.8
This log is representative of test holes Wenham 44-55.		
WENHAM 56. Alt. about 45 ft.		
Geologist's log of auger hole.		
Marine unit:		
Silty sand and organic matter, brown	2	2
Ice-contact deposits:		
Sand, coarse, angular, brown; gravel, fine, angular; much silt	8	10
Sand, medium, angular, much silt, very little gravel	25	35
Refusal:		
Bedrock or boulder		at 35
WENHAM 57. Alt. about 55 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to coarse, angular, silty, brown, some fine gravel	10	10
Refusal:		
Bedrock or boulder		at 10

Table 3.--Logs of selected wells, test wells, and test holes in the lower Ipswich River basin, Massachusetts--Continued

	Thickness	Depth
WENHAM 58. Alt. about 50 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, medium to coarse, angular, silty, poorly sorted, brown, some fine gravel	10	10
Sand, fine to medium, silty, brown, little or no gravel, changes to fine silty sand with depth	27	37
Refusal:		
Bedrock or boulder		at 37
WENHAM 59. Alt. about 70 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, silty, poorly sorted, brown, and rounded gravel	3	3
Marine unit:		
Clayey silt, gray-brown, with coarse, angular sand and fine gravel; very poorly sorted	7	10
Clayey silt, gray, with some sand	10	20
Refusal:		
Bedrock or boulder		at 20
WENHAM 60. Alt. about 70 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand and gravel, fine to coarse, with some silt; gravel, well rounded; poorly sorted	7	7
Clayey silt, brown, stiff	3	10
Till?:		
Sand, fine, silty, brown, with minor gravel; very hard drilling	17	27
Refusal:		
Bedrock or boulder		at 27
WENHAM 61. Alt. about 80 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to coarse, silty, poorly sorted, brown; gravel, coarse, very dense.	7	7
Sand, predominantly fine to medium, poorly sorted, silty, brown; gravel, predominantly fine to medium	6	13
Refusal:		
Bedrock or boulder		at 13
This log is representative of three borings at this site.		
WENHAM 63. Alt. about 55 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, silty, poorly sorted, brown; gravel, coarse, angular; very dense	10	10
Refusal:		
Large rocks and boulders		at 10
WENHAM 64. Alt. about 40 ft.		
Geologist's log of auger hole.		
Marine unit:		
Sand, fine to medium, brown, some gravel	4	4
Sand, fine, brown, some fine gravel and angular rock fragments	8	12
Clayey silt, gray-brown, becoming blue-gray with depth	50	62
"Striking occasional gravel layers and rocks"	7	69
Refusal:		
Bedrock or boulder		at 69
WENHAM 66. Alt. 39 ft.		
Driller's log of test hole.		
Swamp deposits:		
Muck	3	3
Ice-contact deposits:		
Sand, gray	4	7
Gravel and sand	6	13
Gravel	1	14
WENHAM 67. Alt. 38 ft.		
Driller's log of test hole.		
Swamp deposits:		
Muck	1	1
Ice-contact deposits:		
Sand, white	2	3
Sand, yellow	11	14
Yellow sand and gravel	1	15
WENHAM 72. Alt. 37 ft.		
Driller's log of test hole.		
Swamp deposits:		
Muck	9	9
Outwash:		
Gravel, with some clay	5	14
Gravel, fine	9	23
Sand and silt	1	24
WENHAM 74. Alt. about 45 ft.		
Geologist's log of auger hole.		
Swamp deposits:		
Muck, silty, dark brown	3	3
Ice-contact deposits:		
Sand, silty, brown and gray; fine silt	12	15
Refusal:		
Bedrock or boulder		at 15

Table 4.--Chemical analyses of water from selected wells and springs in the lower Ipswich River basin, Massachusetts

(Analytical results in parts per million except as indicated.)

(Analyses by U. S. Geological Survey.)

Well no.	Depth of well (feet)	Geologic unit	Date of collection	Temperature (°F)	Silica (SiO_2)	Total iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
																			Calcium, magnesium	Noncarbonate			
Boxford 52	52.9	Bedrock	12- 8-59	-	9.7	0.10	0.09	10	1.4	5.7	1.4	28	0	12	5.9	0.0	5.0	64	31	8	104	6.5	2
114	110	do.	12- 8-59	-	26	3.0	.43	11	4.0	5.9	1.8	39	0	23	4.0	.2	1.3	94	44	12	132	7.6	2
140	12	Outwash	3- 2-59	51	8.8	.07	.03	7.2	1.6	3.4	.9	21	0	8.5	5.0	.1	1.3	48	25	8	66	6.3	2
175	45	do.	2-25-59	49	7.4	.07	.01	44	13	6.7	.8	161	0	26	14	.0	.0	191	164	32	329	7.5	3
188	11.6	do.	6-16-59	53	10	.63	.03	14	1.8	3.6	1.0	47	0	6.2	5.5	.1	.7	83	43	4	105	6.1	30
Danvers 1	19.5	Ice-contact deposits	6- 9-59	58	11	.08	.05	18	8.5	18	13	30	0	56	9.7	.2	44	187	80	56	281	7.2	5
Hamilton 28	26.4	do.	3- 5-59	47	17	.03	.47	35	11	12	1.9	47	0	89	14	.9	6.9	237	133	94	326	6.3	5
118	35	Ice-contact deposits?	3- 6-59	48	13	.06	.01	28	8.8	9.6	1.1	107	0	25	9.5	.2	.9	153	106	19	245	6.7	2
Ipswich 1 sp	-	Ice-contact deposits	4- 1-59	48	10	.08	.00	17	5.1	9.6	2.1	34	0	31	12	.0	9.2	112	64	36	177	6.8	5
3 sp	-	Till and bedrock	2-25-59	42	4.1	.04	.00	6.0	2.8	5.1	.9	14	0	10	8.4	.2	1.6	47	27	15	76	6.0	15
54	157	Bedrock	12- 8-59	-	14	.11	.15	28	9.8	18	2.8	146	0	21	8.0	.4	1.5	169	111	0	298	6.9	2
331	21	Marine deposits	9-14-60	52.5	17	.15	.19	11	5.6	15	1.7	32	0	20	26.0	.2	5.1	127	51	25	190	6.5	19
Middleton 3	134	Bedrock	6- 9-59	54	15	.16	.07	11	3.1	7.1	.5	31	0	6.1	5.8	.2	22	99	40	15	129	7.2	2
52	65	do.	6- 9-59	58	11	.12	.06	13	2.3	8.2	4.1	34	0	18	5.2	.2	11	92	42	14	143	7.2	2
Peabody 44	21	Ice-contact deposits	6- 9-59	46	10	.13	.00	7.6	1.4	3.7	.6	13	0	11	5.5	.1	.5	47	25	15	65	5.7	3
Topsfield 5	14.2	Outwash	2-25-59	49	8.5	.06	.00	31	2.9	13	4.1	22	0	52	16	.0	33	186	90	72	271	5.9	3
Wenham 35	40	Ice-contact deposits	6-16-59	47	17	.11	.04	17	6.8	15	2.0	84	0	16	12	.2	.2	133	71	2	207	7.0	2
38	387	Bedrock	12- 9-59	-	24	1.2	.39	20	13	32	4.1	128	0	21	31	2.0	.7	210	104	0	365	7.7	4

Table 5.--Chemical analyses of pore water extracted from clays of the marine unit in the lower Ipswich River basin, Massachusetts

(Analytical results in parts per million except as indicated)
(Analyses by U. S. Geological Survey)

Location	Sample no.	Date of collection	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Sulfate (SO_4)	Chloride (Cl)	Specific conductance (micromhos at 25°C)
Appleton Farm, Ipswich	Cly-4	June 1959	86	54	67	222	33	1070
Sewage Plant, Ipswich	Cly-5	June 1959	84	72	60	505	9.8	1150
Appleton Farm, Ipswich	Cly-6	June 1959	7.2	4.5	150	14	27	681
Kimball Brook, Ipswich	Cly-8	June 1959	31	11	28	72	9.4	402

Table 6.--Water levels in observation wells in the lower Ipswich River basin, Massachusetts

(All water levels are given in feet below land-surface datum except if preceded by a (+) indicating the water level is above land-surface datum. For description of wells, see table 2.)

ANDOVER 130

Date	Water level	Date	Water level	Date	Water level
1956		1958		1959	
Aug. 10	11.13	Oct. 15	10.67	Apr. 30	6.63
1958		Nov. 3	9.41	May 29	8.39
July 11	9.55	14	9.21	June 30	8.97
16	9.73	Dec. 2	8.55	Aug. 4	9.31
30	10.08	29	8.62	Sept. 1	10.35
Aug. 13	10.60	1959		23	10.98
27	11.10	Feb. 2	8.59	Oct. 22	11.11
Sept. 10	11.55	Mar. 2	8.37	Nov. 19	10.46
30	10.61	Apr. 2	7.15		

BEVERLY 23

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 24	2.54	Oct. 16	2.66	Feb. 25	2.14
July 16	2.65	29	2.30	Apr. 1	1.94
29	2.38	Nov. 14	2.23	29	1.81
Aug. 15	2.99	28	2.27	June 1	2.33
27	2.77	Dec. 30	2.24	30	2.10
Sept. 15	3.59	1959		July 31	2.05
30	2.66	Jan. 29	2.16	Sept. 1	2.26

BEVERLY 24

Date	Water level	Date	Water level	Date	Water level
1958		1958		1958	
June 24	3.40	Sept. 30	4.75	Dec. 30	4.68
July 16	5.76	Oct. 16	4.97	1959	
29	5.36	29	3.63	Jan. 29	4.70
Aug. 15	5.84	Nov. 14	3.95	Feb. 25	4.80
27	6.14	28	4.34	Apr. 1	3.74
Sept. 15	6.78			29	3.87

BOXFORD 79
(Daily high water levels from recorder graph)

Date	Water level	Date	Water level	Date	Water level
1957		1958		1958	
Oct. 25	15.28	Jan. 20	11.21	Apr. 29	a/3.53
31	15.29	25	8.21	May 27	a/5.66
Nov. 5	15.28	31	4.19	31	5.93
10	15.34	Feb. 5	4.29	June 5	6.36
15	15.36	10	4.67	10	6.77
20	b,e/15.4	15	5.13	15	7.18
25	e/15.4	20	5.50	20	7.63
Dec. 1	e/15.5	25	5.81	25	8.05
6	e/15.5	28	5.00	30	8.46
15	15.28	Mar. 5	4.27	July 5	8.70
20	14.92	10	3.53	10	9.05
25	14.75	15	2.99	15	e/ 9.4
31	14.33	20	2.80	20	e/ 9.8
1958		25	2.24	25	e/10.2
Jan. 5	13.77	31	2.14	28	10.42
10	13.34	Apr. 5	2.32	29	Recorder
15	12.24	8	1.76		discontinued

a/ Tape reading. e/ Estimated reading
b/ Water level too low for float 11/16/57 - 12/12/57

BOXFORD 79

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
Aug. 27	11.97	Dec. 30	10.70	June 30	8.44
Sept. 30	12.98	1959		July 30	8.73
Oct. 16	13.23	Jan. 29	10.76	Aug. 31	10.76
29	12.92	Feb. 26	10.55	Sept. 24	12.02
Nov. 14	12.36	Apr. 1	7.47	Oct. 22	13.07
28	12.17	29	6.57	Nov. 19	13.44
		May 29	7.74		

BOXFORD 121

Date	Water level	Date	Water level	Date	Water level
1957		1958		1959	
Aug. 20	11.04	Nov. 3	7.55	Apr. 30	6.93
1958		14	7.89	May 29	8.87
July 16	9.73	Dec. 2	7.45	June 30	8.34
Aug. 4	9.66	29	8.79	Aug. 4	8.91
13	10.07	1959		Sept. 1	9.87
27	10.24	Feb. 2	8.43	23	10.03
Sept. 10	10.48	Mar. 2	9.34	Oct. 22	9.30
30	9.08	Apr. 2	6.87	Nov. 19	8.13
Oct. 15	9.29				

BOXFORD 173
(Daily high water levels from recorder graph)

Date	Water level	Date	Water level	Date	Water level
1958		1959		1959	
Aug. 15	10.25	Jan. 5	9.19	May 15	8.95
20	10.34	10	9.41	20	9.10
25	10.37	15	9.57	25	9.27
31	10.38	20	9.57	31	9.47
Sept. 5	10.50	25	9.26	June 5	9.50
10	10.56	31	9.52	10	9.60
25	10.46	Feb. 5	9.53	15	9.49
30	10.00	10	9.59	20	9.23
Oct. 5	9.81	15	9.48	25	9.14
10	9.83	20	9.22	30	9.28
15	9.95	25	9.45	July 5	9.46
20	10.08	28	9.60	10	9.61
25	10.08	Mar. 5	8.66	15	9.42
31	8.94	10	8.51	20	9.33
Nov. 5	8.95	15	8.93	25	8.85
10	9.05	20	8.33	31	9.00
15	9.09	25	8.19	Aug. 5	9.28
20	9.16	31	8.58	10	9.47
25	9.28	Apr. 5	8.45	15	9.62
30	9.12	10	8.54	20	9.79
Dec. 5	8.78	15	8.62	25	9.93
10	8.61	20	8.73	31	10.06
15	8.77	25	8.85	Sept. 5	10.12
20	8.99	30	8.84	10	10.22
25	9.23	May 5	8.78	15	10.31
31	9.42	10	8.86		

BOXFORD 173

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 11	9.62	July 29	9.87	Oct. 22	9.51
16	9.68	1959		Nov. 19	10.49
		Sept. 24	10.43		

BOXFORD 177

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 11	7.79	Oct. 16	10.85	Feb. 26	4.68
16	7.18	29	7.46	Apr. 1	1.97
29	8.96	Nov. 14	5.60	29	1.84
Aug. 15	9.86	28	6.13	May 29	5.23
27	10.59	Dec. 30	5.27	June 30	4.26
Sept. 15	11.33	1959		July 30	5.16
30	10.53	Jan. 29	4.94	Aug. 31	8.99

Table 6.--Water levels in observation wells in the lower Ipswich River basin, Massachusetts--Continued

DANVERS 1

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 16	15.10	Oct. 16	15.23	Apr. 29	13.71
July 2	17.95	29	14.89	May 29	16.13
16	16.58	Nov. 14	14.20	June 30	14.09
29	16.15	28	14.35	July 31	13.97
Aug. 15	16.48	Dec. 30	14.32	Sept. 1	15.15
27	16.48	1959		24	16.14
Sept. 15	19.30	Jan. 29	14.49	Oct. 22	17.41
30	16.02	Feb. 25	14.53	Nov. 19	15.00
		Apr. 1	13.63		

DANVERS 4

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 2	11.37	Oct. 16	11.72	Feb. 26	11.42
16	11.73	29	11.32	Mar. 31	10.59
29	12.01	Nov. 14	10.14	Apr. 29	9.66
Aug. 15	12.22	28	10.35	May 29	10.87
27	12.55	Dec. 30	10.39	June 30	10.32
Sept. 15	12.96	1959		July 30	10.15
30	12.56	Jan. 29	11.08	Aug. 31	11.94

HAMILTON 31

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 25	≠.25	Oct. 29	0	Apr. 29	≠.70
July 16	≠.66	Nov. 14	≠.70	June 1	0
29	≠.46	28	≠.70	30	≠.70
Aug. 15	≠.70	Dec. 30	f	July 31	≠.70
27	≠.61	1959		Sept. 1	≠.70
Sept. 15	≠.70	Jan. 29	f	24	2.97
30	≠.68	Feb. 25	f	Oct. 22	3.53
Oct. 16	≠.70	Apr. 1	≠.63	Nov. 19	3.44

f Water frozen in casing
0 Well overflowing, approximately 0.01 ft.above MP

HAMILTON 35

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 25	4.37	Oct. 16	6.61	Feb. 25	4.48
July 16	5.30	29	5.45	Apr. 1	2.23
29	5.05	Nov. 14	5.31	29	1.80
Aug. 15	6.15	28	5.74	June 1	4.20
27	6.54	Dec. 30	5.63	30	3.71
Sept. 15	7.12	1959		July 31	4.34
30	6.38	Jan. 29	5.16	Sept. 1	6.05

HAMILTON 37

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 25	1.61	Oct. 29	2.08	Apr. 29	1.02
July 16	2.01	Nov. 14	1.99	June 1	1.60
29	1.94	28	2.13	30	1.48
Aug. 15	2.43	Dec. 30	2.01	July 31	1.59
27	2.51	1959		Sept. 1	2.27
Sept. 15	3.00	Jan. 29	2.00	24	2.80
30	2.48	Feb. 25	1.90	Oct. 22	2.13
Oct. 16	2.55	Apr. 1	1.04	Nov. 19	2.48

HAMILTON 38

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 25	2.96	Oct. 29	2.51	Apr. 29	2.22
July 16	3.20	Nov. 14	2.60	June 1	2.88
29	3.08	28	2.70	30	2.52
Aug. 15	3.52	Dec. 30	2.68	July 31	2.57
27	3.42	1959		Sept. 1	3.03
Sept. 15	3.90	Jan. 29	2.57	24	3.54
30	2.99	Feb. 25	2.53	Oct. 22	3.25
Oct. 16	3.54	Apr. 1	2.23		

HAMILTON 40

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 25	9.01	Oct. 16	10.30	Feb. 25	7.86
July 16	8.99	29	9.06	Apr. 1	6.10
29	9.55	Nov. 14	7.31	29	5.99
Aug. 15	10.14	28	7.68	June 1	7.73
27	10.58	Dec. 30	7.18	30	7.29
Sept. 15	11.16	1959		July 31	6.59
30	11.19	Jan. 29	7.85	Sept. 1	8.79

HAMILTON 41

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 2	18.97	Oct. 16	22.44	Feb. 25	20.49
16	21.07	29	22.47	Apr. 1	19.32
29	21.74	Nov. 14	20.74	29	18.92
Aug. 15	22.33	28	20.42	May 29	18.99
27	22.78	Dec. 30	19.65	June 30	19.09
Sept. 15	23.40	1959		July 31	17.83
30	23.50	Jan. 29	20.28	Aug. 31	20.81

HAMILTON 55

Date	Water level	Date	Water level	Date	Water level
1958		1959		1959	
Sept. 29	12.58	Jan. 29	10.18	July 31	9.39
Oct. 16	12.00	Feb. 25	9.93	Aug. 31	11.76
29	10.60	Apr. 1	8.87	Sept. 24	12.82
Nov. 14	9.60	29	9.01	Oct. 22	13.38
28	10.16	June 1	10.42	Nov. 19	14.59
Dec. 30	10.06	30	10.38		

IPSWICH 2
(Records from 1947-51 published in Geological Survey Water-Supply Papers)

Date	Water level	Date	Water level	Date	Water level
1955		1958		1958	
July 8	10.14	Jan. 27	5.23	Nov. 28	9.45
Sept. 7	9.23	Feb. 26	8.71	Dec. 30	9.35
1957		Mar. 26	6.61	1959	
Feb. 28	8.12	Apr. 29	7.74	Jan. 29	9.32
Apr. 1	8.30	May 27	8.52	Feb. 25	9.09
May 2	8.95	July 2	9.89	Apr. 1	8.09
June 4	9.67	16	10.15	29	8.23
21	10.20	29	10.36	May 29	9.46
Aug. 2	11.81	Aug. 15	10.68	June 30	8.92
21	12.22	27	10.95	July 30	9.13
Sept. 24	d	Sept. 15	12.38	Aug. 31	10.46
Oct. 31	d	30	10.67	Sept. 24	10.82
Dec. 6	10.90	Oct. 16	10.70	Oct. 22	13.78
27	9.17	29	9.22	Nov. 19	10.19
		Nov. 14	9.21		

d Dry

IPSWICH 14

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 2	4.89	Oct. 16	10.72	Feb. 25	2.22
16	5.41	29	9.81	Apr. 1	2.00
29	5.55	Nov. 14	9.33	29	2.03
Aug. 15	9.69	28	4.04	May 29	3.58
27	11.54	Dec. 30	3.38	June 30	2.73
Sept. 15	11.98	1959		July 30	2.50
30	10.89	Jan. 29	3.06	Aug. 31	4.98

IPSWICH 19

Date	Water level	Date	Water level	Date	Water level
1958		1959		1959	
July 24	5.17	Jan. 29	3.70	May 29	4.10
Nov. 14	3.99	Feb. 25	3.77	June 30	3.29
28	3.55	Mar. 31	3.09	July 30	4.15
Dec. 30	3.46	Apr. 29	2.56	Aug. 31	5.43

Table 6.--Water levels in observation wells in the lower Ipswich River basin, Massachusetts--Continued

IPSWICH 19
(Daily high water levels from recorder graph)

Date	Water level	Date	Water level	Date	Water level
1958		1958		1958	
Aug. 15	5.68	Sept. 15	6.67	Oct. 15	7.29
20	5.88	20	6.85	20	e/7.3
25	5.86	25	7.02	25	7.08
31	6.10	30	7.27	31	8.00
Sept. 5	6.27	Oct. 5	7.18	Nov. 4	5.32
10	e/6.38	10	7.12	5	Recorder discontinued

e/ Estimated reading

IPSWICH 20

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 28	12.51	Nov. 14	11.15	May 29	11.84
Aug. 15	12.66	28	11.55	June 30	11.26
27	12.82	Dec. 30	10.90	July 30	10.55
Sept. 15	13.22	1959		Sept. 1	12.42
30	12.72	Jan. 29	11.64	24	12.96
Oct. 16	12.54	Feb. 25	11.27	Oct. 22	13.09
29	12.09	Mar. 31	10.12	Nov. 19	12.73
		Apr. 29	9.88		

IPSWICH 21
(Daily high water levels from recorder graph)

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 28	a/7.33	Dec. 5	4.84	Apr. 10	5.37
Aug. 12	e/7.8	10	4.84	15	4.98
15	7.96	15	5.17	20	5.03
20	8.23	31	6.21	25	5.07
25	8.40	1959		30	3.99
31	8.55	Jan. 5	5.97	May 5	3.81
Sept. 5	8.72	10	6.27	10	4.18
10	8.92	15	6.58	15	4.54
15	9.12	20	6.64	20	4.96
20	9.17	25	6.32	25	5.32
25	9.25	31	6.58	31	5.86
30	8.62	Feb. 5	6.67	June 5	6.12
Oct. 5	8.43	10	6.88	July 1	6.04
10	8.46	15	6.68	5	6.17
15	8.50	20	6.87	10	6.38
20	8.56	25	7.14	15	5.52
25	8.60	28	7.32	20	e/5.5
31	7.32	Mar. 5	7.17	21	Recorder discontinued
Nov. 5	6.92	10	6.92		
10	6.53	15	6.95	30	a/5.13
15	6.51	20	6.27	Sept. 1	a/7.79
20	6.51	25	6.30	24	a/8.93
25	6.63	31	6.40	Oct. 22	a/7.85
31	5.59	Apr. 5	5.49	Nov. 19	a/8.45

a/ Tape reading e/ Estimated reading

MIDDLETON 18

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 3	4.80	Oct. 29	4.63	Apr. 29	1.78
16	6.41	Nov. 14	4.09	May 29	4.50
Aug. 4	5.38	28	4.59	June 30	3.82
15	5.86	Dec. 30	4.75	July 30	4.08
27	6.02	1959		Aug. 31	5.68
Sept. 15	7.08	Jan. 29	5.48	Sept. 24	6.36
30	5.44	Feb. 26	4.42	Oct. 22	6.14
Oct. 16	5.56	Mar. 31	2.19	Nov. 19	5.07

MIDDLETON 31

Date	Water level	Date	Water level	Date	Water level
1958		1958		1958	
July 10	3.26	July 30	2.49	Aug. 27	3.14
16	3.22	Aug. 13	3.91		

MIDDLETON 36
(Daily high water levels from recorder graph)

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 10	a/9.41	Dec. 20	6.87	May 10	6.13
16	a/9.63	25	7.22	15	6.47
28	10.03	31	7.55	20	6.87
31	9.94	1959		25	7.37
Aug. 5	10.08	Jan. 5	7.31	31	7.90
10	10.31	10	7.66	June 5	8.10
15	10.49	15	7.93	10	8.30
20	10.66	20	7.97	15	8.40
25	10.86	25	7.34	20	7.53
31	10.85	31	e/7.6	25	7.50
Sept. 5	11.05	Feb. 5	7.71	30	7.73
10	a/11.18	10	7.89	July 5	8.24
15	11.34	15	7.90	10	8.70
20	11.28	20	7.66	15	8.43
25	11.13	25	7.93	20	8.29
30	10.77	28	e/8.2	25	7.73
Oct. 5	10.00	Mar. 5	7.70	31	8.40
10	9.68	10	7.20	Aug. 5	8.90
15	9.63	15	7.51	10	9.17
20	9.61	20	7.18	15	9.51
Nov. 5	6.73	25	6.74	20	9.88
10	6.82	31	6.74	25	10.05
15	6.93	Apr. 5	5.65	29	10.28
20	7.02	10	5.61	Sept. 5	10.24
25	7.27	15	5.50	10	10.37
30	6.65	20	3.87	15	a/10.51
Dec. 5	6.28	25	6.00	15	Recorder discontinued
10	6.12	30	5.49		
15	6.55	May 5	5.63		

a/ Tape reading e/ Estimated reading

MIDDLETON 53

Date	Water level	Date	Water level	Date	Water level
1958		1958		1958	
July 11	9.98	July 30	11.00	Aug. 27	12.84
16	10.08	Aug. 13	12.12		

MIDDLETON 55

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 11	5.45	Oct. 15	6.74	Mar. 2	5.47
16	6.78	Nov. 3	5.95	Apr. 2	3.84
30	6.45	14	5.87	30	3.65
Aug. 13	6.98	Dec. 2	5.69	May 29	5.00
27	7.11	29	5.59	June 30	4.92
Sept. 10	7.39	1959		Aug. 4	5.43
30	6.35	Feb. 2	5.93	Sept. 1	6.26

NORTH ANDOVER 23

Date	Water level	Date	Water level	Date	Water level
1957		1958		1959	
July 2	11.55	Nov. 3	9.10	Apr. 30	8.85
1958		14	8.97	May 29	9.49
July 18	10.84	Dec. 2	8.82	June 30	9.58
30	10.72	29	9.46	Aug. 4	9.77
Aug. 13	11.25	1959		Sept. 1	10.99
Sept. 10	11.93	Feb. 2	9.84	23	11.20
30	10.61	Mar. 2	10.11	Oct. 22	10.58
Oct. 15	10.40	Apr. 2	9.10	Nov. 19	9.40

Table 6.--Water levels in observation wells in the lower Ipswich River basin, Massachusetts--Continued

NORTH ANDOVER 74

Date	Water level	Date	Water level	Date	Water level
1957		1958		1959	
July 2	4.76	Oct. 15	3.13	Mar. 2	f
1958		Nov. 3	2.12	Apr. 2	1.57
July 18	2.95	14	2.26	30	0.89
30	2.69	Dec. 2	2.04	May 29	1.25
Aug. 13	3.30	29	f	June 30	1.49
Sept. 10	3.76	1959		Aug. 4	1.55
30	2.72	Feb. 2	f	Sept. 1	1.83

f Frozen

NORTH ANDOVER 84

Date	Water level	Date	Water level	Date	Water level
1957		1958		1959	
July 2	18.67	Nov. 3	15.80	Apr. 30	15.57
1958		14	15.82	May 29	15.87
July 18	16.67	Dec. 2	15.75	June 30	15.92
30	16.45	29	16.00	Aug. 4	16.11
Aug. 13	17.10	1959		Sept. 1	16.42
27	17.05	Feb. 2	15.61	23	16.70
Sept. 10	17.84	Mar. 2	16.39	Oct. 22	16.45
30	16.43	Apr. 2	15.64	Nov. 19	16.02

NORTH ANDOVER 121

Date	Water level	Date	Water level	Date	Water level
1957		1958		1959	
Aug. 19	11.64	Oct. 15	7.62	Mar. 2	5.83
1958		Nov. 3	5.52	Apr. 2	4.29
July 18	7.98	14	5.85	30	4.73
30	7.61	Dec. 2	5.37	May 29	7.08
Aug. 13	8.49	29	6.72	June 30	6.48
Sept. 10	9.69	1959		Aug. 4	7.20
30	7.27	Feb. 2	5.30	Sept. 1	7.77

NORTH ANDOVER 126

Date	Water level	Date	Water level	Date	Water level
1957		1958		1959	
Aug. 19	17.93	Oct. 15	16.47	Mar. 2	12.40
1958		Nov. 3	15.19	Apr. 2	10.25
July 18	14.27	14	12.89	30	10.47
30	14.72	Dec. 2	11.96	May 29	11.71
Aug. 13	15.50	29	13.23	June 30	12.26
Sept. 10	16.95	1959		Aug. 4	13.60
30	17.22	Feb. 2	13.36	Sept. 1	15.90

PEABODY 41

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 3	19.38	Oct. 16	24.93	Feb. 26	26.46
16	20.39	29	25.44	Mar. 31	26.18
29	21.35	Nov. 14	25.88	Apr. 29	26.01
Aug. 15	22.28	Dec. 1	26.12	May 29	25.51
27	22.81	30	25.89	June 30	25.18
Sept. 15	23.63	1959		July 30	23.94
30	24.32	Jan. 29	26.32	Aug. 31	23.61

PEABODY 49

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
July 11	35.43	Nov. 3	35.87	Apr. 30	35.42
16	35.57	14	35.69	May 29	35.61
30	35.74	Dec. 2	35.56	June 30	35.55
Aug. 13	35.81	29	35.36	Aug. 4	35.04
27	35.90	1959		Sept. 1	35.51
Sept. 10	35.96	Feb. 2	35.23	23	35.75
30	36.02	Mar. 2	35.06	Oct. 22	35.93
Oct. 15	35.91	Apr. 2	34.79	Nov. 19	36.00

TOPSFIELD 5

Date	Water level	Date	Water level	Date	Water level
1957		1958		1958	
Sept. 23	10.67	July 2	8.87	Dec. 30	8.82
Oct. 23	10.45	16	9.09	1959	
30	10.52	29	9.20	Jan. 29	8.90
Dec. 6	9.83	Aug. 15	9.43	Feb. 25	8.90
27	9.06	27	9.50	Apr. 1	8.12
1958		Sept. 15	9.83	29	8.10
Jan. 27	6.50	30	9.11	May 29	8.68
Feb. 26	7.98	Oct. 16	9.25	June 30	8.36
Mar. 26	6.38	29	8.59	July 30	8.16
Apr. 29	7.19	Nov. 14	8.50	Aug. 31	8.99
May 27	7.87	28	8.69	Sept. 24	9.33
				Oct. 22	9.32

WENHAM 1

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 24	5.90	Oct. 29	5.73	Apr. 29	5.22
July 16	6.47	Nov. 14	5.64	June 1	6.10
29	6.23	28	5.73	30	5.60
Aug. 15	6.65	Dec. 30	5.81	July 31	5.70
27	6.63	1959		Sept. 1	6.42
Sept. 15	7.23	Jan. 29	5.80	24	6.99
30	6.30	Feb. 25	5.90	Oct. 22	6.64
Oct. 16	6.40	Apr. 1	5.35	Nov. 19	5.98

WENHAM 2

Date	Water level	Date	Water level	Date	Water level
1958		1958		1959	
June 26	10.92	Oct. 29	12.21	Apr. 29	10.11
July 16	11.60	Nov. 14	11.64	June 1	10.89
29	11.96	28	11.64	30	10.90
Aug. 15	12.30	Dec. 30	11.35	July 31	10.60
27	12.55	1959		Sept. 1	11.87
Sept. 15	12.88	Jan. 29	11.04	24	12.49
30	12.73	Feb. 25	10.76	Oct. 22	12.85
Oct. 16	12.55	Apr. 1	10.08	Nov. 19	12.73

Table 7.--Pumpage of ground water for municipal supply in the lower Ipswich River basin, Massachusetts

(Millions of gallons)

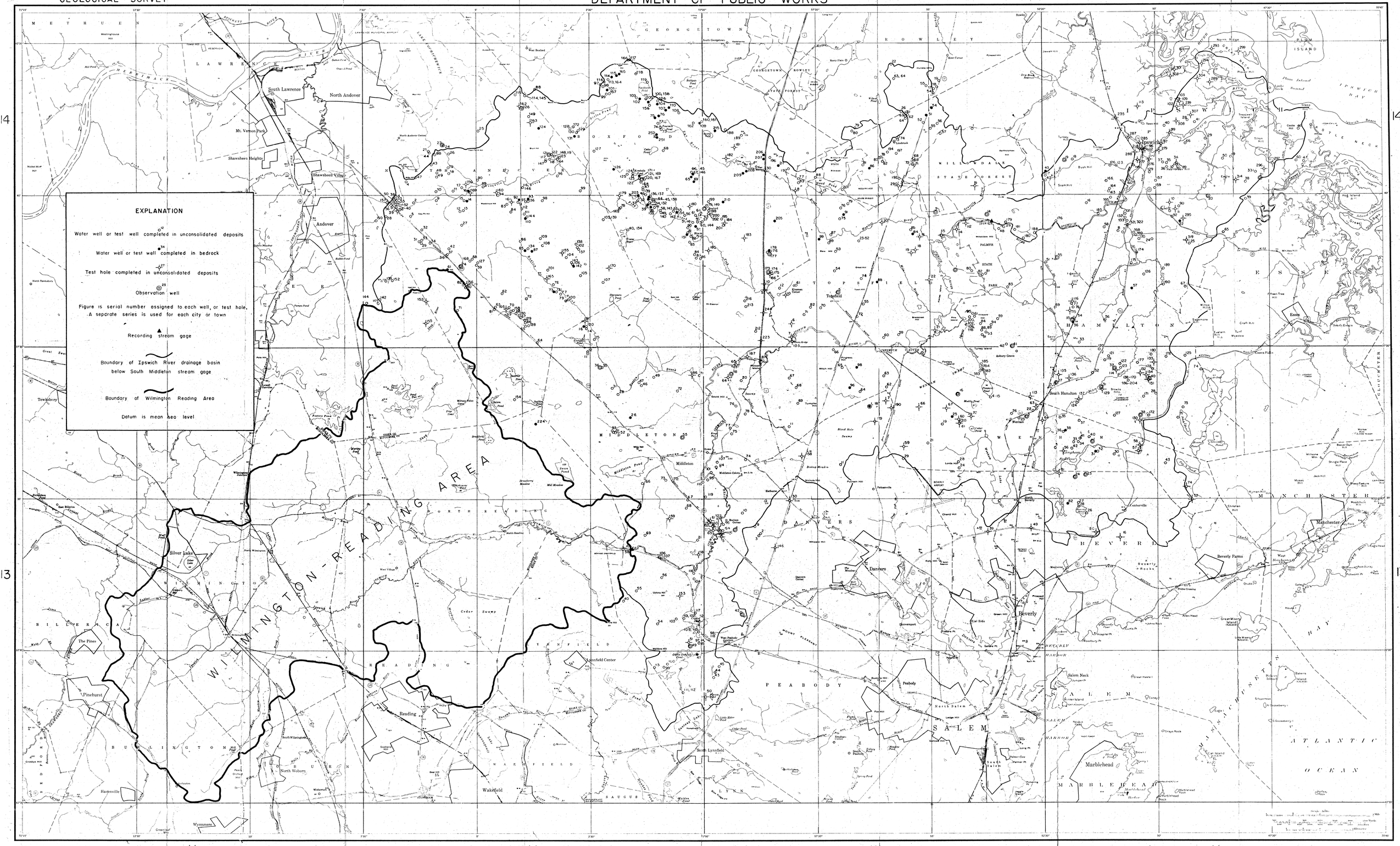
Water year (Oct. 1 Sept. 30)	HAMILTON		WENHAM		TOPSFIELD		PEABODY		DANVERS	
	Annual	Daily average	Annual	Daily average	Annual	Daily average	Annual	Daily average	Annual	Daily average
1960	116.830	0.319	63.341	0.173	64.402	0.176	180.922	0.494	3/ 99.130	0.597
1959	104.729	0.287	59.097	0.162	54.227	0.149	193.981	0.531		
1958	84.825	0.232	52.513	0.144	23.540	0.064	160.383	0.439		
1957	118.167	0.324	63.772	0.175	26.677	0.073	114.079	2/0.395		
1956	76.697	0.210	51.025	0.139	20.793	0.057				
1955	70.773	0.194	46.660	0.128	21.364	0.059				
1954	63.096	0.173	37.772	0.103	22.835	0.063				
1953	63.120	0.173	40.340	0.111	20.748	0.057				
1952	57.424	0.157	32.824	0.090	20.973	0.057				
1951	44.528	0.122	27.087	0.074						
1950	42.551	0.117	23.684	0.065						
1949	47.012	0.129	1/ 14.176							
1948	40.588	0.111								
1947	35.469	0.097								
1946	29.993	0.082								
1945	23.556	0.065								
1944	24.552	0.067								
1943	22.244	0.061								
1942	25.185	0.069								
1941	23.597	0.065								

1/ Incomplete.
2/ Based on assumed starting date: Dec. 15, 1956.
3/ From July 19, 1960.

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

FIGURE 1



Base from U. S. Geological Survey
Special Maps Branch

MAP OF IPSWICH RIVER DRAINAGE BASIN, MASSACHUSETTS, SHOWING WILMINGTON-READING AREA AND LOCATIONS OF SELECTED WELLS, TEST HOLES, AND SPRINGS BELOW THE STREAM-GAGING STATION AT SOUTH MIDDLETON