

**Introduction**

The area of this report includes that part of southwest Vermont drained by the Winoski River. This study is part of a cooperative program between the United States Geological Survey and the State of Vermont Department of Water Resources to provide a statewide reconnaissance of ground-water availability. Information presented in this report is based on a limited amount of data; it is intended as a guide for local exploration, and not as a statement that conditions are uniform everywhere within a water favorability area. Further studies are recommended for detailed appraisals of ground-water quantities available within this area.

The areas of greatest ground-water potential are along the Winoski River and most of its major tributaries. Other less promising areas are scattered throughout the basin. Silt and clay deposits occur as a thin cover in most of the stream valleys, but toward the mouth of the Winoski River, these deposits are thicker and mask the underlying water-bearing gravel.

**Ground-Water Favorability Areas**

Areas underlain by thick deposits of coarse-grained stratified glacial drift have excellent ground-water potential. Suitable for exploration to locate wells that should yield sufficient quantities of water to meet municipal and industrial requirements. Deposits are thinner and wells would be less productive along the margins of these areas.

Areas underlain by thin deposits of coarse-grained stratified glacial drift and stream gravel have low to moderate ground-water potential. Suitable for exploration to locate shallow wells and infiltration galleries that should yield sufficient quantities of water for domestic, commercial, and light industrial use.

Areas underlain by fine-grained stratified glacial drift and swamp deposits have low ground-water potential. These deposits generally will yield sufficient water for domestic wells only. In places, thin lenses of gravel with higher yields may underlie these deposits, but these lenses may not have adequate storage or recharge to produce high yields on a sustained basis.

Areas underlain by deposits of unstratified glacial drift (called till or "hardpan") and bedrock ("ledge") have low ground-water potential. In general, wells in either till or bedrock will yield only enough water for domestic or light commercial use. Till and bedrock underlie the stratified glacial drift of the map units listed above.

- Water wells in stratified glacial drift
- Water wells in glacial till and bedrock
- Test borings
- Basin boundary

**WATER WELLS**

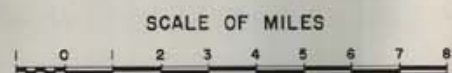
Number	Owner	Location	Total Depth (in ft)	1/ Depth to Bedrock (in ft)	1/ Aquifer	1/2/ Yield (in gallons per minute)
1.	McKenzie Packing Company, Inc.	Burlington	340	NR	Sand	30
2.	Fort Ethan Allen U.S. Government	Winoski	31	NR	Sand & Gravel	450
3.	International Business Machines Corp.	Essex Junction	370	212	Rock	365
4.	Williston Cemetery Association	Williston	193	7	Rock ?	5
5.	Town of Hinesburg (four (4) wells in series)	Hinesburg	47	NR	Sand & Gravel	100
6.	Richmond Coop. Creamery	Richmond	42	NR	Sand & Gravel	140
7.	Hersom Cosemel	Huntington	152	90	Rock 1/	50
8.	Stowe Fluke Motel	Stowe	140	NR	Sand & Gravel	100
9.	E. Piper	Waterbury Center	250	12	Rock	15
10.	Burton Luce	Waterbury Center	133	NR	Gravel	15
11.	Town of Waterbury	Waterbury	140	NR	Sand & Gravel	300
12.	Sverett Maynard	Waretown	240	140	Rock	10
13.	U.S.G.S.	Middlesex	30	NR	Sand & Gravel	7
14.	Ken Weston	Serlin	40	NR	Sand & Gravel	50
15.	Village of Northfield Falls	Northfield Falls	18	NR	Sand & Gravel	12
16.	Town of Northfield	Northfield	50	NR	Sand & Gravel	600
17.	L. C. Beauchamp	South Woodbury	12	NR	Sand & Gravel	3
18.	Cecil Morse	Lower Cabot	6	NR	Fine sand	5
19.	William George	North Montpelier	44	NR	Gravel	15
20.	Buttericks Dairy Co.	East Montpelier	450	50	Rock	60
21.	Granite City Co-operative Creamery	Barre	45	NR	Sand & Gravel	350
22.	L. Melbridge	Williamstown	12	NR	Sand & Gravel	100

NR Not Reached  
 1/ Reported by owner or driller  
 2/ May be limited by capacity of pump  
 3/ Water-bearing sand with clay over bedrock

**TEST BORINGS (Vermont Department of Highways)**

23.	Colchester - Interstate 89 over State Route 127	Elevation 139 ft
	Fine sand . . . . . 0 - 78 ft	
	Ended in sand, silt & clay @ 78 ft	
	Not to bedrock	
24.	Burlington - Interstate 89 under U.S. 2	Elevation 313 ft
	Silt and clay . . . . . 0 - 64 ft	
	Boulders or bedrock . . . . . 64	
25.	Shelburne - U.S. Route 7 bridge over La Platte River approximately 0.4 mile North of Shelburne Village South end of bridge	Elevation 114 ft
	Rock fill . . . . . 0 - 12 ft	
	Soil & sand . . . . . 12 - 16	
	Yellow clay & sand . . . . . 16 - 20	
	Silt & sand, trace of clay binder . . . . . 20 - 27	
	Sand & fine gravel . . . . . 27 - 35	
	Gray clay & gravel hardpan, gray clay . . . . . 35 - 45	
	Blue clay . . . . . 45 - 66	
	Fine gravel ? . . . . . 66	
	Not to bedrock	
26.	Richmond - Interstate 89 over C. V. Railroad East end	Elevation 295 ft
	Sand & gravel . . . . . 0 - 40 ft	
	Not to bedrock	
27.	Richmond - bridge over Huntington River approximately 0.3 mile South of Towers School South end of bridge	Elevation 279 ft
	Topsoil . . . . . 0 - 6 ft	
	Coarse gravel . . . . . 6 - 74	
	Coarse sand . . . . . 74 - 84	
	Fine sand . . . . . 84 - 21	
	Sand & gravel . . . . . 21 - 27	
	Bedrock . . . . . 27	
28.	Richmond - Interstate 89 over Route 7	Elevation 320 ft
	Sand & fine gravel . . . . . 0 - 30 ft	
	Not to bedrock	
	Several logs show very fine white sand at bottom.	
29.	Warren - Vt. Route 100 bridge over Clay Brook near Robinson School	Elevation 385 ft
	Gravel . . . . . 0 - 9 ft	
	Fine sand . . . . . 9 - 33	
	Fine sand, some clay . . . . . 33 - 51	
	Fine gravel . . . . . 51 - 53	
	Not to bedrock	
30.	Middlesex - Interstate 89, Middlesex interchange	Elevation 598 ft
	Sand & gravel . . . . . 0 - 15 ft	
	Clay & fine sand . . . . . 15 - 40	
	Not to bedrock	
31.	Middlesex - Interstate 89 over relocated Route 2 Sand & gravel outwash	Elevation 515 ft
	90 ft	
	Lithology highly variable with considerable gravel scattered through section	
	Not to bedrock	
32.	City of Montpelier - Bailey Avenue Extension bridge over Winoski River North end of bridge	Elevation 518 ft
	Topsoil, sand & cinders (fill) . . . . . 0 - 8 ft	
	Fill . . . . . 8 - 16	
	Silt, sand & gravel . . . . . 16 - 35	
	Bedrock . . . . . 35	
33.	City of Montpelier - Winski U.S. Route 2 East Montpelier Road bridge over Winoski River approximately 0.4 mile Southeast of junction of U.S. 2 & U.S. 302	Elevation 535 ft
	Sand & gravel . . . . . 0 - 3 ft	
	Blue clay, some sand & gravel . . . . . 3 - 40	
	Bedrock . . . . . 40	
34.	East Montpelier - Plainfield bridge on U.S. Route 2 over Winoski River just East of town line Northeast corner of bridge	Elevation 677 ft
	Slightly compact gravel, some sand, trace of silt . . . . . 0 - 20 ft	
	Slightly compact sand, some gravel, trace of silt . . . . . 20 - 28	
	of silt . . . . . 28 - 40	
	Compact silt, some sand . . . . . 40 - 60	
	Dense sand, some gravel, trace of silt, grading to slightly compact sand, trace of gravel, trace of silt . . . . . 60 - 68	
	Very dense silt and sand, some gravel . . . . . 68 - 75	
	Very dense sand, little silt . . . . . 75 - 79	
	Very dense gravel & sand, some silt . . . . . 79 - 85	
	Very dense sand, some silt . . . . . 85	
	Not to bedrock	
35.	East Barre Dam - middle of dam (above) toe of rock slope	Elevation 1,133 ft
	Sand, some silt, little gravel . . . . . 0 - 8 ft	
	Silt & sand . . . . . 8 - 18	
	Sand . . . . . 18 - 28	
	Fine sand, some silt . . . . . 28 - 41	
	Artesian flow 2 gpm at 40 ft	
	Broken stone . . . . . 41 - 44	
	Clay & silt . . . . . 44 - 45	
	Fine sand . . . . . 45 - 57	
	Boulder . . . . . 57 - 58	
	artesian flow 48 gpm at 58 ft	
	Fine sand . . . . . 58 - 82	
	Sand . . . . . 82 - 83	
	Not to bedrock	

**GROUND WATER FAVORABILITY MAP OF THE WINOSKI RIVER BASIN, VERMONT**



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 UNITED STATES GEOLOGICAL SURVEY  
 BY  
 ARTHUR L. HODGES, JR.  
 U.S. GEOLOGICAL SURVEY  
 ASSISTED BY  
 DAVID BUTTERFIELD  
 VT. DEPT. OF WATER RESOURCES

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