

Introduction

The area of this report includes that part of northern Vermont drained by Lake Memphremagog and the Coaticook River, both of which flow northward into the St. Lawrence River in Canada. 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 and is intended as a guide for local exploration, and not as a statement that conditions are uniform everywhere within a ground-water favorability area. Further studies are recommended for a more detailed appraisal of ground-water availability.

The areas of greatest ground-water potential are along the northern half of the Black River, Willoughby Brook south of Crystal Lake, the Coaticook River, and most of the Clyde River. Less promising areas for ground-water development occur along the Brownington, Willoughby and Barton Rivers. Silt and clay deposits limit the ground-water potential of the southern part of the Black River and the mouth of the Barton River.

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



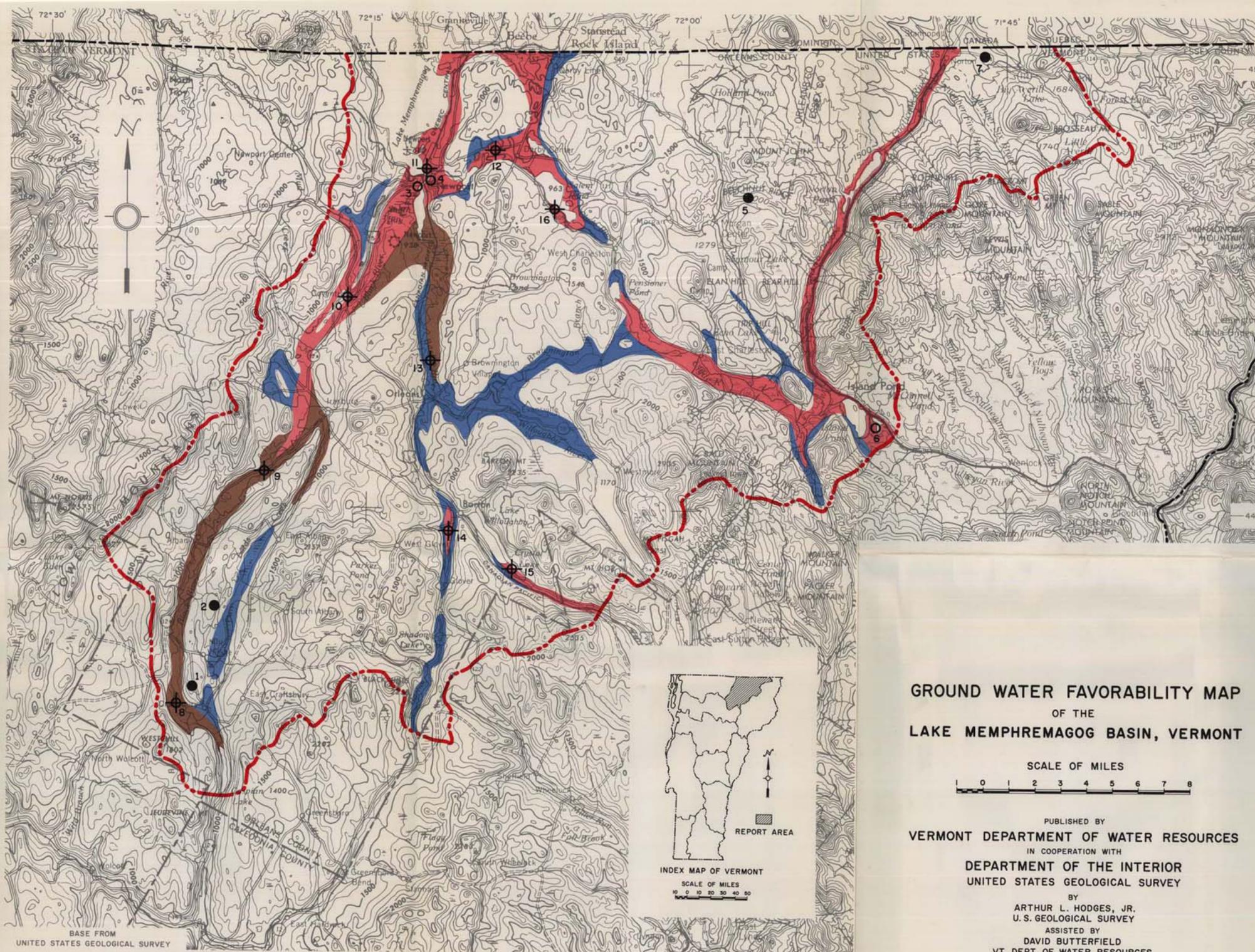
Water wells in glacial till and bedrock



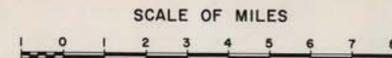
Test borings



Basin boundary



GROUND WATER FAVORABILITY MAP
OF THE
LAKE MEMPHREMAGOG BASIN, VERMONT



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UNITED STATES GEOLOGICAL SURVEY

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WATER WELLS AND TEST BORINGS

Number	Owner	Location	Total Depth (in ft)	1/		Yield 1/2/ (in gallons per minute)
				Depth to Bedrock (in ft)	1/ Aquifer	
1.	Craftsbury Common Water Company	Craftsbury	450	4	Rock	6
2.	V. F. Valchick	Craftsbury	180	10	Rock	50
3.	City of Newport	Newport City	209	NR	Sand	550
4.	City of Newport	Newport City	200	NR	Sand	350
5.	Wildwood Valley Lodge	Morgan	154	30	Rock	35
6.	State of Vermont Forests and Parks	Brighton	15	NR	Sand	50
7.	Gaeton Shibault	Norton	122	69	Rock	18

NR Not Reached
1/ Reported by owner or driller
2/ May be limited by capacity of pump

TEST BORINGS (Vermont Department of Highways)

8.	Craftsbury - State Aid Highway 4 over Black River 0.8 mile West of Craftsbury Village	Elevation	875 ft
	Fine sand & silt 0 - 8 ft		
	Muck & clay 8 - 12		
	Blue clay 12 - 81		
	Not to refusal		
9.	Albany - Vt. Route 14 over Black River	Elevation	400 ft
	Fine sand with clay, minor gravel 0 - 53 ft		
10.	Coventry - Vt. Route 14 over Black River	Elevation	693 ft
	Fine sand & a little clay 0 - 8 ft		
	Coarse gravel 8 - 39		
	Fine gravel 39 - 59		
11.	Newport - Park Street bridge over Clyde River	Elevation	687 ft
	East end of bridge		
	Top soil 0 - 6 ft		
	Sand & silt 6 - 30		
	Fine sand & clay 30 - 33		
	Fine sand & silt 33 - 36		
	Fine sand & clay 36 - 49		
	Gravel 49 - 71		
	Not to refusal		
12.	Derby - Interstate 91 over Clyde River 1 mile East of Derby Center	Elevation	910 ft
	Sand, silt, some clay, trace gravel 0 - 10 ft		
	Gravel (very dense), some sand, some silt 10 - 50		
	Not to refusal		
13.	Irasburg - Interstate 91 over Barton River 1.3 miles North of Orleans	Elevation	711 ft
	-Pier #1, South bound lane		
	Sand, some silt, little gravel 0 - 7 ft		
	Sand & gravel, some silt 7 - 24		
	Bedrock 24		
	-Pier #3, South bound lane	Elevation	695 ft
	Silt & sand 0 - 17 ft		
	Silt, trace clay 17 - 26		
	Gravel & sand 26 - 30		
	Silt & clay 30 - 70		
	Bedrock 70		
	-Abutment #2 (North end), South bound lane	Elevation	694 ft
	Silt & sand 0 - 5 ft		
	Sand, some silt, trace gravel 5 - 23		
	Silt & clay 23 - 90		
	Bedrock 90		
14.	Barton - Interstate 91 over Barton River South of Barton Village	Elevation	858 ft
	-West end		
	Gravel, some sand, little silt 0 - 11 ft		
	Gravel, some silt, trace sand 11 - 14		
	Bedrock 14		
	-East end	Elevation	858 ft
	Sand & gravel, trace silt 0 - 9 ft		
	Silt with some gravel & sand 9 - 22		
	Gravel & sand, little silt 22 - 33		
	Bedrock 33		
15.	Barton - U.S. Route 5 bridge over Willoughby Brook	Elevation	953 ft
	Top soil & sand 0 - 6 ft		
	Sand & gravel 6 - 24		
	Refusal (possible bedrock) 24		
16.	Derby - bridge across South end of Salem Pond	Elevation	968 ft
	Sand, some gravel, little silt 0 - 14 ft		
	Silt & sand, little gravel 14 - 57		
	Bedrock or boulder 57		