Map No. 1

HYDROGEOLOGY of the WESTERN ANNAPOLIS VALLEY, NOVA SCOTIA

DEPARTMENT OF MINES, NOVA SCOTIA

1969

Scale: One Inch to One Mile = $\frac{1}{63,360}$

1 0 1 2 3 4 5

Scale in Miles

LEGEND

CENOZOIC

QUATERNARY
RECENT
- Salt marsh and tidal flat
- Dykeland
- Stream alluvium
- Peat and muck

PLEISTOCENE
Ice-contact stratified drift
- Kames, kame complex
- Esker
- Estuarine silt and clay
- Till

MESOZOIC

TRIASSIC
- 6 NORTH MOUNTAIN BASALT - basalt
- 5 BLOMIDON FORMATION - siltstone, arenaceous shale, minor sandstone and claystone
- 4 WOLFVILLE FORMATION - sandstone, conglomerate, siltstone and claystone

PALAEOZOIC

MISSISSIPPIAN
- 3 HORTON GROUP - Siltstone, sandstone and arkose (present only at the eastern end of the Annapolis-Cornwallis Valley)

DEVONIAN
- 2 SOUTHERN NOVA SCOTIA BATHOLITH - porphyritic granite.

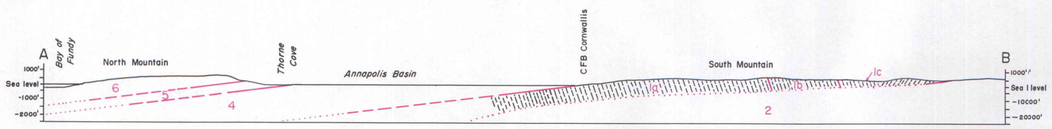
LOWER PALAEOZOIC
- 1 Ic, TORBROOK FORMATION (LOWER DEVONIAN); NEW CANAAN FORMATION (UPPER SILURIAN); Ib, KENTVILLE FORMATION (UPPER SILURIAN); WHITE ROCK FORMATION (UPPER SILURIAN or earlier); Ia, HALIFAX FORMATION (ORDOVICIAN); GOLDENVILLE FORMATION (ORDOVICIAN or earlier) — Mainly slate and quartzite

Bedrock boundary (approximate, assumed)
Surficial deposit boundary (approximate)
Fault (approximate, assumed)
Strike and dip of bedding
Measured section
Raised beach
Raised estuarine deposits
Outcrop used to locate bedrock boundary
Test hole location and number
Water well (drilled, flowing artesian, dug) and index number
Spring and index number
Roads
Trail
County line
Stream
Lake
Marsh or swamp
Building
Dyke
Railways
Contour, interval 50 feet

Bedrock geology on South Mountain is taken from a map by F.C. Taylor (1962). Triassic boundaries have been plotted from field work and air photo interpretation by P.C. Trescott, 1968.

Surficial geology was mapped by P.C. Trescott, 1968, with reference made to soil maps of Digby County (J.D. Hilchey, D.B. Cann, and J.T. MacDougall 1962) and Annapolis County (in press).

Base map compiled by the Cartographic Division, Nova Scotia Department of Mines from topographic maps on a scale of 1:50,000 of the National Topographic Series obtained from the Department of Energy, Mines and Resources, Ottawa.



Section along line A-B

TABLE OF WELL AND SPRING DATA

Index no.	Depth (feet)*	Water level (feet)*	Chemical Analysis
2		3	
3	95	14	
4	140	28	
5	244	14	
6	100		X
7		2	
8	161	3	X
9	170	80	X
10		105	X
11	112	3	
12		8	X
13	90	5	
14		20	
15		2	
16			X
17	100	2	X
18		82	
19	156	105	
20	216	78	
21	203	114	
22	305	3	
23		120	
24	358	4	
25	433	22	X
26	400	19	X
27	110	29	X
28		3	
29		3	
30		3	
31		2	
32		6	
33	125	20	X
34	130	17	
35	68	6	
36		11	
37	78	10	
38		6	X
39	194	0	
40	90	11	
41	175	45	
42	98	28	X
43	120	10	X
44	167	0	
45	63	12	
46	60	30	X
47	55	8	
48	39	4	
49	190	42	
50	180	19	
51		3	
52	62	10	
53	150	40	
54	175	16	
55	200	19	
56		5	
57	190	15	
58	350	30	
59	86	15	
60	200		
61	115	4	X
62		5	
63	80		
64	228	80	
65	170	63	
66	105	20	
67		39	
68	155		
69		6	
70	136	20	
71	200	21	X
72	122	20	
73		6	
74	120	30	
75		4	
76	147	21	X
77	40	11	
78	250	69	
79		8	
80		8	
81		24	
82	98		
83	145	15	X
84		6	
85	130	28	
86	107	4	
87	105		
88		25	
89		3	
90	90	5	
91	120	15	X
92		22	
93		5	
94	93	5	X
95	125	60	X
96	20	6	X
97	214	6	X
98	110	100	X
99		24	
100		12	
101		5	
102		12	
103		2	
104		11	
105		16	
106	93	10	
107		29	
108	168	5	
109		146	
110		5	
111		4	

* measurements for drilled wells have been taken from drillers' reports; dug wells were measured during the early summer of 1968.

NOTES ON THE POTENTIAL FOR GROUNDWATER SUPPLIES

The following outline is a summary of information in Report 69-1. In general the quality of groundwater is good to excellent except where noted. Drilled wells constructed near the sea in any geologic unit may yield water deteriorating in quality with time due to salt water intrusion; such wells may yield brackish water from the start where the surrounding land has low relief. Yields are given in imperial gallons per minute (gpm).

INDIVIDUAL WELLS MAY YIELD FROM 5 TO 200+ GPM
(Wolfville Formation and Ice-contact Stratified Drift)

Wells several hundred feet deep in the Wolfville Formation should penetrate enough water-bearing sandstone and conglomerate beds (except along the flank of South Mountain where the formation wedges out) to produce at least 100 gpm. High capacity wells in this formation may have to be screened to prevent the pumping of sand.

Screened wells in stratified drift may produce several hundred gpm where the aquifer is of sufficient thickness and extent (e.g., along and adjacent to the Allain River at Lequille). The long term yield from more restricted aquifers (e.g. kame deposits at Seaview, Clementsport, and Clementsvale) will probably be less than 100 gpm. Most of the other stratified drift deposits are small and can be expected to yield little more than a domestic supply (1-3 gpm) to wells.

INDIVIDUAL WELLS MAY YIELD FROM 2 TO 40 GPM
(Blomidon Formation, North Mountain Basalt, and South Mountain Granite)

Wells in the Blomidon Formation derive their water primarily from thin sandstone lenses and beds, and secondarily from fracture permeability. In general, only wells penetrating sandstone beds with a total thickness of several tens of feet will yield up to 40 gpm. It is possible that a few wells in this formation will penetrate gypsum lenses which will make the water excessively hard.

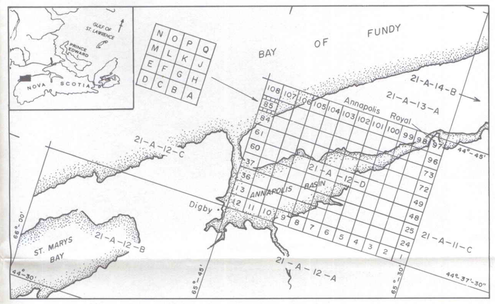
Permeability in the North Mountain Basalt and in the South Mountain Granite is concentrated along fractures which tend to parallel the surface. Although a few "dry" holes are known, domestic supplies can usually be obtained; in places wells will penetrate sufficient water-bearing fractures to yield up to 40 gpm.

INDIVIDUAL WELLS MAY YIELD FROM 1 TO 10 GPM
(Lower Palaeozoic Metamorphic Rocks, Glacial Till, and Stream Alluvium)

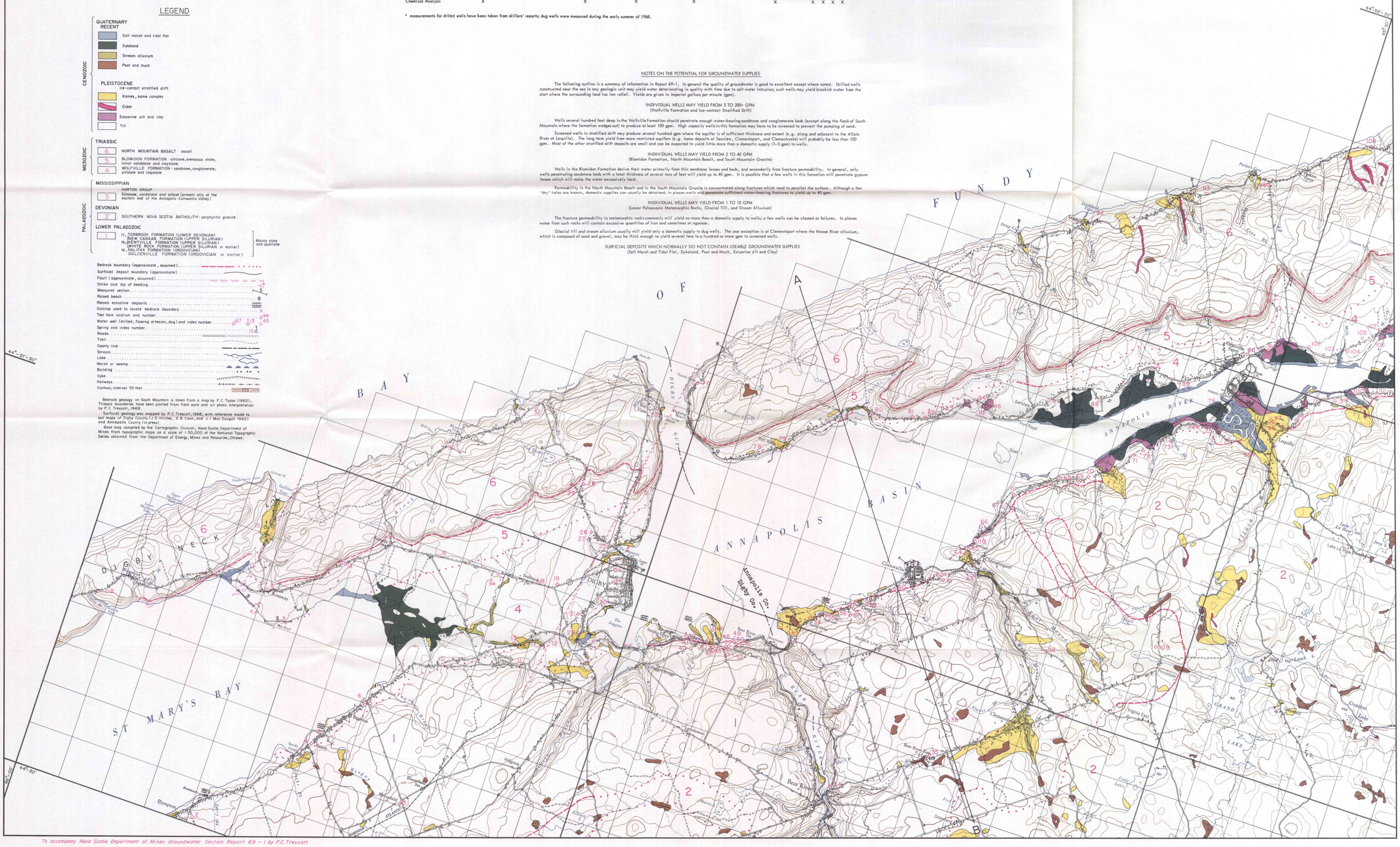
The fracture permeability in metamorphic rocks commonly will yield no more than a domestic supply to wells; a few wells can be classed as failures. In places water from such rocks will contain excessive quantities of iron and sometimes manganese.

Glacial till and stream alluvium usually will yield only a domestic supply to dug wells. The one exception is at Clementsport where the Moose River alluvium, which is composed of sand and gravel, may be thick enough to yield several tens to a hundred or more gpm to screened wells.

SURFICIAL DEPOSITS WHICH NORMALLY DO NOT CONTAIN USEABLE GROUNDWATER SUPPLIES
(Salt Marsh and Tidal Flat, Dykeland, Peat and Muck, Estuarine silt and Clay)



INDEX TO MINING TRACT GRID



To accompany Nova Scotia Department of Mines Groundwater Section Report 69 – 1 by P.C. Trescott