GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

LEGEND

CENOZOIC

PLEISTOCENE AND RECENT

A — *Estuarine deposits: clay and silt*

B — *Glaciofluvial deposits (eskers, kames), dune sands, and alluvium: sand and gravel*

MESOZOIC

TRIASSIC

C — *Basalt*

D — *ANNAPOLIS FORMATION: red sandstone, conglomerate, and siltstone*

PALAEOZOIC

CARBONIFEROUS

E — *PICTOU and CUMBERLAND GROUPS: brown and grey sandstone, conglomerate and shale*

F — *RIVERSDALE and CANSO GROUPS: grey and red shale and sandstone*

G — *WINDSOR GROUP: limestone, shale, gypsum and salt*

H — *HORTON and RIVER JOHN GROUPS: red and grey sandstone, conglomerate, and shale*

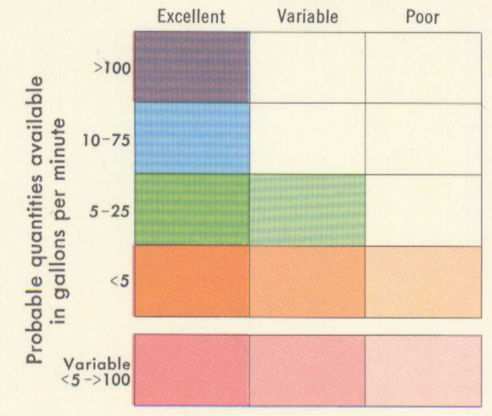
PRE-CARBONIFEROUS

I — *Cobequid complex and dyke rocks: granitic, volcanic and sedimentary rocks*

J — *MEGUMA GROUP: slate and quartzite*

Aquifer designation . . . . A
Hydrogeological boundary . . . .

GROUNDWATER PROBABILITY

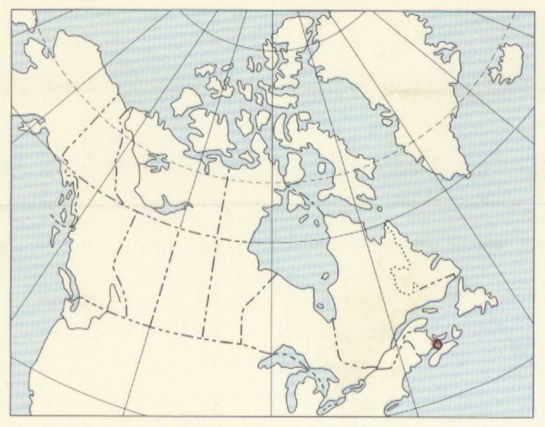


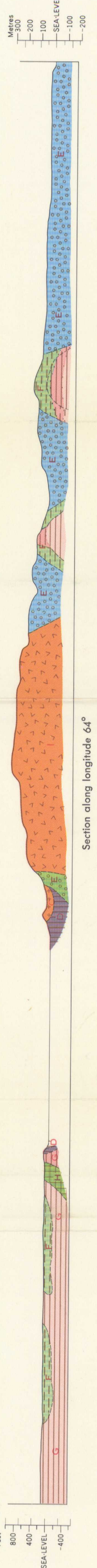
Variable quality indicates that water quality may be very hard from sulphates in Windsor rocks or may be high in iron. Poor quality indicates areas of karst or known salt springs

Compiled by L. V. Brandon, 1963 from sources of information listed

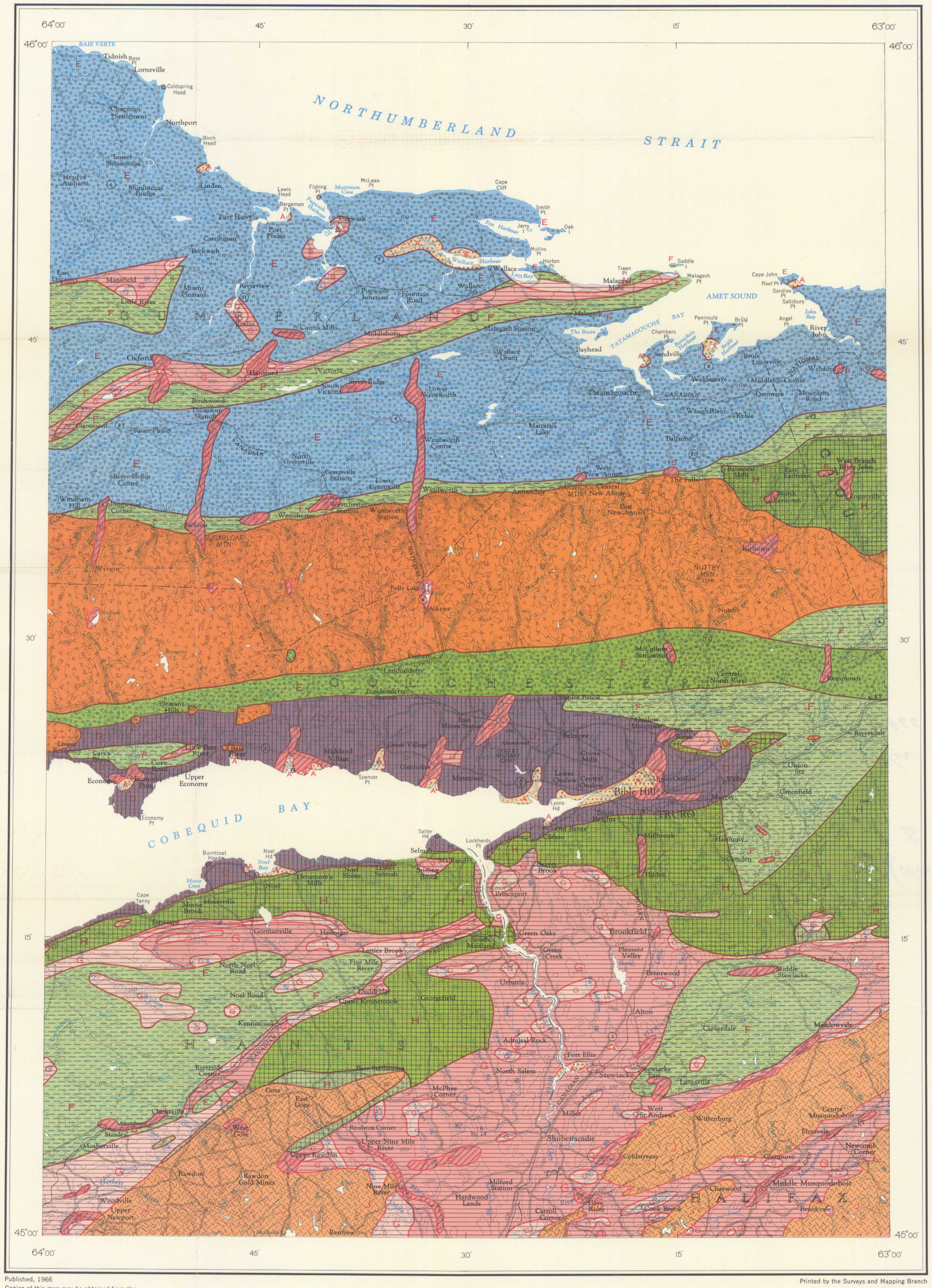
Base-map cartography by the Army Survey Establishment, R.C.E., 1955

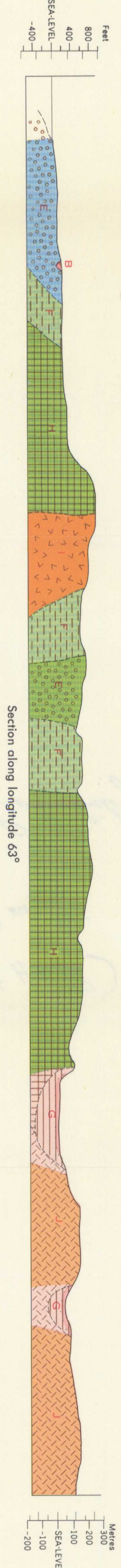
Mean magnetic declination 22°47′ West, decreasing 2.4′ annually. Readings vary from 23°48′ W in the NE corner to 22°20′ in the SW corner of the map-area





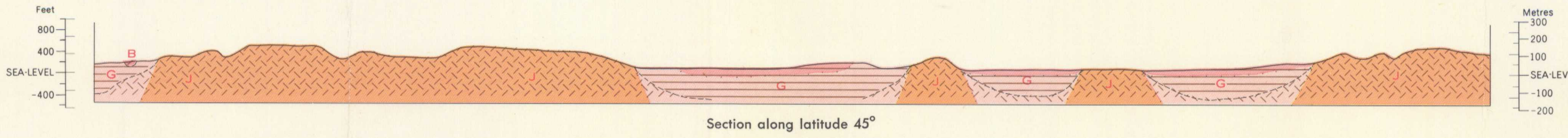
11 E (West Half)





Published, 1966
Copies of this map may be obtained from the Director, Geological Survey of Canada, Ottawa

Printed by the Surveys and Mapping Branch



Section along latitude 45°

MAP 1160A
GROUNDWATER PROBABILITY
TRURO
(West Half)
NOVA SCOTIA

Scale 1:253,440
1 inch to 4 miles

Miles 4 — 0 — 4 — 8 — 12 Miles
Kilometres 6 — 0 — 6 — 12 — 18 Kilometres

NOTES

This groundwater-probability map has been compiled from numerous geological publications and from data obtained during three weeks of field work in 1963.

The colours of the map outline areas where drilled wells of 6-12 inches internal diameter may be expected to yield water of different quantity and quality. The patterns in brown outline various rock formations whose aquifer properties are described below.

While interpreting the map the following should be borne in mind:

1. Groundwater moves by intergranular permeation through sands, by fracture permeation along joints in consolidated rock, and by open flow through solution channels in gypsum. There is no groundwater flow through massive unjointed rocks.
2. Water moves from high ground to low ground and discharges into rivers or into the sea. The depth to water depends on topography and may be over 100 feet in high ground above steep slopes and may be less than 10 feet in low-lying ground. Flowing wells may occur in river valleys and along the seashore.
3. Aquifer test information was available in only one locality. Estimates of yield are based on well records and assume that at least 100 feet of rock are penetrated in rock aquifers. Aquifer tests will be necessary to establish the long term yield of new well-fields.
4. Rock is overlain through most of the map-area by a thin mantle of glacial drift, and alluvium is present along many river valleys. The scale of the map does not permit the delineation of all glacial and alluvial deposits. These deposits [(B)—see below] are outlined only where they are extensive. Smaller areas may be found and should always be tested as they may prove to be excellent aquifers.
5. Many fault zones are present within rock formations and the boundaries between some formations have been formed by faulting. These faults are not shown because data obtained so far do not indicate either an increased or retarded flow along or across these fault zones. Locations of the major faults are shown in more detailed geological maps. The sections are presented here to illustrate the sequence of rock formations. The thickness of some formations have been estimated.
6. The dissolved mineral content of groundwater is affected by the rocks through which the water flows and by the length and depth of the flow system. There is an increase in mineral content with length and depth of flow. Water may flow from one geological formation to another and therefore the symbols for quantity and quality do not conform entirely to geological boundaries.
7. Pollution of groundwaters from septic tanks or from other effluent can occur more easily in those places where the mantle of glacial drift is thin or absent and in those rocks where water can move rapidly through joints or solution channels.
8. Average rainfall in the map-area ranges from 38-42 inches per year. Evapotranspiration exceeds precipitation during some months of summer. Many farms and private dwellings obtain water from springs or from dug wells. These supplies are sometimes insufficient during dry spells in summer.

WATER-YIELDING PROPERTIES

Estuarine deposits: Clay and silt (A)—These sediments have a high moisture content but do not readily yield potable water. In those places where A overlies D or E it may be possible to obtain good water from the underlying sandstone, but care should be taken to avoid overpumping in the sandstone as salt-water intrusion may occur.

Glaciofluvial deposits (eskers, kames), dune, sands and alluvium: sand and gravel (B)—The variable thickness and variety of grain size make it impractical to predict the yield of water. In those places where more than 25 feet of saturated sand and gravel are present it may be possible to construct a screened well to yield more than 100 gpm. Smaller yields may be obtained by driving a screened sand point into saturated sand. The quality should be excellent. In those places where B is less than 25 feet deep it may be necessary to drill to the underlying rock formation.

Basalt (C)—No record has been obtained locally of the yield of wells in these rocks. A small yield can be expected from joint permeation in wells over 100 feet deep. The quality of water should be excellent.

Annapolis Formation: red sandstone, conglomerate, and siltstone (D)—Most of the movement of water through this formation is along joints and bedding planes, but intergranular permeation also occurs. The transmissibility varies considerably owing to variations in joint spacing. Aquifer tests near Debert have shown a range in transmissibility for a 100-foot section of rock from 3,500-17,000 gpdf. The highest reported yield from this formation is 400 gpm from one well in Truro. The quality is excellent but varies with depth. Waters at Debert have a hardness and sum of constituents less than 100 ppm. At Truro, where wells have been drilled to 500 feet, the hardness is less than 125 ppm, and the sum of constituents is less than 400 ppm.

Pictou and Cumberland Groups: brown and grey sandstone, conglomerate, and shale (E)—The movement of water through these rocks is mainly along joints and bedding planes. The yield from wells north of the Cobequid Mountains may range from 10-75 gpm, the higher yields being from deep wells in low lying areas. South of the Cobequid Mountains these rocks are more consolidated and yield 5-25 gpm. Water quality is excellent. Analyses from four samples show that they are calcium bicarbonate waters having a range of hardness from 90-150 ppm, and a sum of constituents from 170-210 ppm. Sediment has been reported in the water from some wells; this may be derived from the shale and could be eliminated by well development.

Riversdale and Canso Groups: grey and red shale and sandstone (F)—Yields from wells in these rocks may range from 5-25 gpm. The quality of waters varies considerably. Most wells drilled on high ground yield water of good quality not exceeding 260 ppm sum of constituents. In some valleys and in the area west of Kennetcook the water from wells and springs is too highly mineralized for consumption. The mineralized water is derived by upward leakage from the underlying Windsor rocks.

Windsor Group: limestone, shale, gypsum, and salt (G)—The presence of solution channels in gypsum makes the yield from this group extremely variable. The chemical quality of water also varies greatly owing to gypsum and salt. Areas of karst terrain and places where mineralized spring waters are known to occur are delineated as areas of poor water quality. Domestic water supplies are obtained from shallow dug wells and cisterns throughout most of the area where these rocks occur.

Horton and River John Groups: red and grey sandstone, shale, and conglomerate (H)—These rocks may be expected to yield 5-25 gpm. Water quality should be good except in those areas where flow may be from the Windsor Group or the Meguma Group (see below), in which case variable chemical quality may be expected.

Cobequid complex and dyke rocks: granitic, volcanic, and sedimentary rocks (I)—In most places there is sufficient jointing in these rocks to yield 1 gpm in valleys. Joints may be too tight at depths greater than 100 feet to yield any water. The quality of water should be excellent.

Meguma Group: Slate and quartzite (J)—Small supplies may be available from joint flow. As the iron content of waters in these rocks varies considerably (up to 14 ppm) iron treatment may be necessary.

SOURCES OF INFORMATION

Bell, W. A.: Carboniferous formations of Northumberland Strait, Nova Scotia; Geol. Surv. Can., Sum. Rept. 1924, pt. C, pp. 142-180 (1926).

________: Shinimikas, Cumberland county, Nova Scotia; Geol. Surv. Can., Map 842A (1945).

Cann, D. B., and Wicklund, R. E.: Soil survey of Pictou county; Canada and Nova Scotia Depts. of Agriculture, Nova Scotia Soil Survey, Report No. 4 (1950).

Cann, D. B., et al.: Soil survey of Hants county, Nova Scotia; Canada and Nova Scotia Depts. of Agriculture, Nova Scotia Soil Survey, Report No. 5 (1954).

Fletcher, Hugh: Tatamagouche, Pugwash and Wentworth map-sheets, Nova Scotia; Geol. Surv. Can., Maps 793, 795, and 796 (1905).

Gillis, J. W.: Geology of northwestern Pictou county, Nova Scotia; unpub. PhD. thesis, The Pennsylvania State U., University Park, Penna. (1964).

Goodman, N. R.: Gypsum and anhydrite in Nova Scotia; Nova Scotia Dept. of Mines, Memoir 1 (1952).

Hayes, A. O.: The Malagash salt deposit, Cumberland county, Nova Scotia; Geol. Surv. Can., Memoir 121 (1920).

________: Report on the potash possibilities of Nova Scotia; Nova Scotia Dept. of Mines, Ann. Rept. 1930, pt. 2 (1931).

Hughes, O. L.: Surficial geology of Shubenacadie map-area; Geol. Surv. Can., Paper 56-3 (1957).

Norman, G. W. H., and Bell, W. A.: Oxford map-sheets, Cumberland and Colchester counties, Nova Scotia; Geol. Surv. Can., Maps 409A, 410A (1938).

Stevenson, I. M.: Truro map-area, Nova Scotia; Geol. Surv. Can., Memoir 297 (1958).

________: Shubenacadie and Kennetcook map-areas, Nova Scotia; Geol. Surv. Can., Memoir 302 (1959).

Weeks, L. J.: Londonderry and Bass River map-areas, Nova Scotia; Geol. Surv. Can., Memoir 245 (1948).

Whiteside, G. B., et al.: Soil survey of Cumberland county; Canada and Nova Scotia Depts. of Agriculture, Nova Scotia Soil Survey, Report No. 2 (1945).

Wickenden, R. T. D.: Glacial deposits of part of northern Nova Scotia; Trans. Roy. Soc. Can., vol. 35, sec. IV (1941).

Wicklund, R. E., and Smith, G. R.: Soil survey of Colchester county; Canada and Nova Scotia Depts. of Agriculture, Nova Scotia Soil Survey, Report No. 3 (1948).

Young, Edward J.: A ground water problem in the north shore area, Nova Scotia; Nova Scotia Dept. of Mines, Ann. Rept., pt. II (1951).