PENNSYLVANIA DEPARTMENT OF INTERNAL AFFAIRS
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TOPOGRAPHIC AND GEOLOGIC SURVEY
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GROUND-WATER RESOURCES OF BUCKS COUNTY PENNSYLVANIA

BY
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1953

BASE IS GEOLOGIC MAP BY B. WILLARD, D. B. MCLAUGHLIN, E. H. WATSON AND OTHERS
PENNSYLVANIA TOPOGRAPHIC AND GEOLOGIC SURVEY, PLATE 2, BULLETIN C 9, 1950

Scale 62500

Contour interval 20 feet
Datum is mean sea level

HYDROLOGIC SYMBOLS

- 178 Water well
- Sp 5 Spring
  Numbers correspond to numbers in tables of well and spring records
- Stream-gaging station
- Weather station, U.S. Weather Bureau.

REMARKS

Hardness is expressed in terms of calcium carbonate ($CaCO_3$). Iron is expressed as total iron in terms of Fe. Hydrologic descriptions of formations are based upon conditions reported for wells tapping them, or upon analyses of water from those wells. Unusually high or low yields, or anomalous water-quality characteristics sometimes occur near formation boundaries or fault zones, or at shallow depth. Most wells obtain their water from depths less than 300 feet.

Hydrologic descriptions for the following rock formations are not given because they have limited areal extent:

Cocalico phyllite
Beekmantown limestone
Granite gneiss
Altered ultrabasic rocks
Hornblende schist
Metadiabase
Franklin limestone

HYDROLOGY OF GEOLOGIC FORMATIONS

Wisconsin (Pleistocene) and Recent

Larger municipal and industrial wells yield 200 to 5,000 gpm. Water is generally hard, but iron content is usually less than 100 ppm, and dissolved solids less than 200 ppm. The reaction is usually acidic and the iron content ranges from less than 0.2 ppm to more than 20 ppm. Well water resembles Delaware River water in quality where infiltration occurs.

Pre-Wisconsin Pleistocene

Most drilled wells penetrating this formation tap the underlying Wissahickon schist.

Diabase

Wells generally yield less than 50 gpm, commonly less than 20 gpm. Higher yields sometimes occur near contact with the Brunswick lithofacies. The hardness of the water ranges from about 50 to about 160 ppm, the dissolved solids content from 80 to about 240 ppm. The reaction is usually acidic, but iron content is usually less than 0.5 ppm.

Brunswick lithofacies

Larger municipal and industrial wells yield 20 to about 200 gpm. The hardness of the water ranges from about 50 to 270 ppm, the dissolved solids from 120 to 400 ppm. The reaction is usually alkaline and the iron content less than 0.5 ppm. The average hardness of water from the limestone is about 190 ppm, and from the quartzite about 50 ppm. The dissolved-solids content is usually about 120 ppm in the limestone and 120 ppm in the quartzite.

Lockatong lithofacies

The larger wells yield between 20 and 100 gpm. The hardness of the water ranges from about 70 to 300 ppm and is usually greater than 150 ppm. Dissolved solids range from about 100 to 400 ppm and are usually higher than 200 ppm. The reaction is generally alkaline and the iron content usually less than 0.2 ppm.

Stockton lithofacies

Yields of the larger municipal and industrial wells range from 70 to about 300 gpm. The hardness of the water is usually greater than 20 and less than 320 ppm, generally less than 180 ppm. The dissolved solids range from about 40 to 250 ppm, but are usually less than 200 ppm. The reaction of the softer water is acidic and of the harder water alkaline. The iron content is generally less than 0.2 ppm.

Conococheague limestone
Elbrook limestone
Cambrian limestones undifferentiated

Larger wells yield as much as 500 gpm or more, although some yield less than 50 gpm. The hardness of the water ranges from about 30 to 280 ppm, the dissolved solids from about 100 to 350 ppm. The reaction is alkaline and the iron content usually less than 0.2 ppm.

Hardyston and Chickies quartzite

The larger wells yield between 20 and 100 gpm. The hardness of the water ranges from about 40 to 120 ppm, the dissolved solids from about 60 to 160 ppm. The reaction is generally acidic, but the iron content is usually less than 0.2 ppm.

Wissahickon schist

The larger wells yield from 25 to 150 gpm. The hardness of the water is usually greater than 100 ppm, the dissolved solids between 150 and 200 ppm, and the iron content usually less than 0.5 ppm.

Gneiss

The yields of the larger wells range from 20 to 100 gpm. The hardness of the water is generally greater than 20 and less than 120 ppm, the dissolved solids greater than 60 and less than 120 ppm, and the iron content less than 0.2 ppm.

ABBREVIATIONS

ppm—parts per million, by weight
gpm—gallons per minute

STRUCTURE SYMBOLS

Fault
Dashed where approximately located
U, upthrown side; D, downthrown side

Concealed fault

Thrust fault

Strike and dip of beds

Horizontal bed

Strike and dip of foliation

Strike of vertical foliation

Direction and plunge of lineation and fold axes

Fossil locality

ECONOMIC FEATURES

Sand and/or gravel pit

Clay pit

Mine or quarry

Prospect

Letter adjacent to symbol indicates product

L - Limestone (agricultural lime or flux stone; including both limestone and dolomite; exclusive of crushed limestone)

S - Crushed stone (road metal, aggregate stone, ballast, etc.; produced from diabase, shale, sandstone and limestone)

D - Dimension stone (includes rough flagging, ashlar, Belgian block, building and monument stone, etc.)

Si - Silica rock

W - Slag

Cu - Copper

Ba - Barite

Pb - Lead

P - Pigment

Fe - Iron

* Number adjacent to pit, mine or quarry symbol refers to a list of properties active in 1948

EXPLANATION

ROCKS

QUATERNARY

Qwr — Wisconsin (Pleistocene) and Recent
Unconsolidated sand, gravel and clay deposits in river terraces and flood plains

Qpw — Pre-Wisconsin Pleistocene
Unconsolidated sand and gravel deposits in river terraces

TRIASSIC

Td — Diabase
Igneous sills and dikes intruding Triassic and older sedimentary rocks

Trc, Tb, Trc — Brunswick lithofacies
Redshales and sandstones grading upward into limestone, Trc, and quartzite, Trq; , fanglomerates along the northwest margin. Altered to black, hornfels adjacent to diabase intrusions

Tl — Lockatong lithofacies
Gray to black argillite, grades laterally into Brunswick. Altered to black hornfels adjacent to diabase intrusions

Ts — Stockton lithofacies
Red, gray and brown shales and arkoses, with local arkosic conglomerates.

ORDOVICIAN

Oc — Cocalico phyllite
Gray to brown and various colors, highly sheared, bedding obscured

Ob — Beekmantown (?) limestone
Massive-bedded, high magnesium, non-fossiliferous

CAMBRIAN

Cc — Conococheague (Limeport) limestone
Massive bedded, high magnesium, Cryptozoa and oolites abundant

Ce — Elbrook (?) limestone
Massive to laminated, high magnesium, non-fossiliferous

Cl — Cambrian limestones
Generally high magnesium, undifferentiated in Reading Hills, includes Conococheague (Allentown) and Tomstown (Lehigh) rocks. Tomstown, C_1, locally differentiated in narrow belts along Triassic border fault

Ch, Cch — Hardyston and Chickies quartzite
Hardyston, Ch, north, and Chickies, Cch, south, quartzite. Quartzite, sandstone, jasper, quartzschist and conglomerate. Italian conglomerate member at base in south

LATE PRE-CAMBRIAN OR EARLY PALEOZOIC

gr — Granite gneiss
Granitized areas in Wissahickon schist approaching granodiorite in composition and grading into the schist

sp — Altered ultrabasic rocks
Serpentine, talc schist and associated alteration products

hs — Hornblende schist
Altered igneous rocks occurring as conformable sheets associated with the Wissahickon schist, locally granitized

ws — Wissahickon schist
Banded meta-sedimentary quartz-mica-feldspar schist and gneiss, at places containing garnet, staurolite and sillimanite. Certain areas granitized

PRE-CAMBRIAN

md — Metadiabase
As dikes in Baltimore gneiss

gn, gbr, gnf — Gneiss
In the north, Byron granite gneiss and Peekskill hornblende gneiss, undifferentiated, gn. In the south, Baltimore gneiss, grading from mafic (gabbroic), gbr, to felsic (granodioritic), gnf. Largely a metamorphosed hybrid igneous rock, banded or more rarely massive

fl — Franklin limestone
White, coarsely crystalline marble in Baltimore gneiss, containing graphite and skarn minerals

SOURCES OF TOPOGRAPHIC AND CULTURAL DATA

U. S. Army Map Service: Quadrangles – 7½-minute series

Bedminster, Beverly, Buckingham, Bristol, Columbus, Doylestown, Frenchtown, Lambertville, Langhorne, Milford Square, Pennington, Perkiomenville, Point Pleasant, Quakertown, Riegelsville, Stockton, Telford, Trenton East, Trenton West

U. S. Geological Survey: Quadrangles – 15-minute series

Allentown, Germantown

Pennsylvania Department of Highways

Bucks County Highway Map — unpublished

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