Ground-Water Resources of TUSCARAWAS COUNTY

by
Douglas J. Barber

1 0 1 2 Miles

1 0 1 2 Kilometers

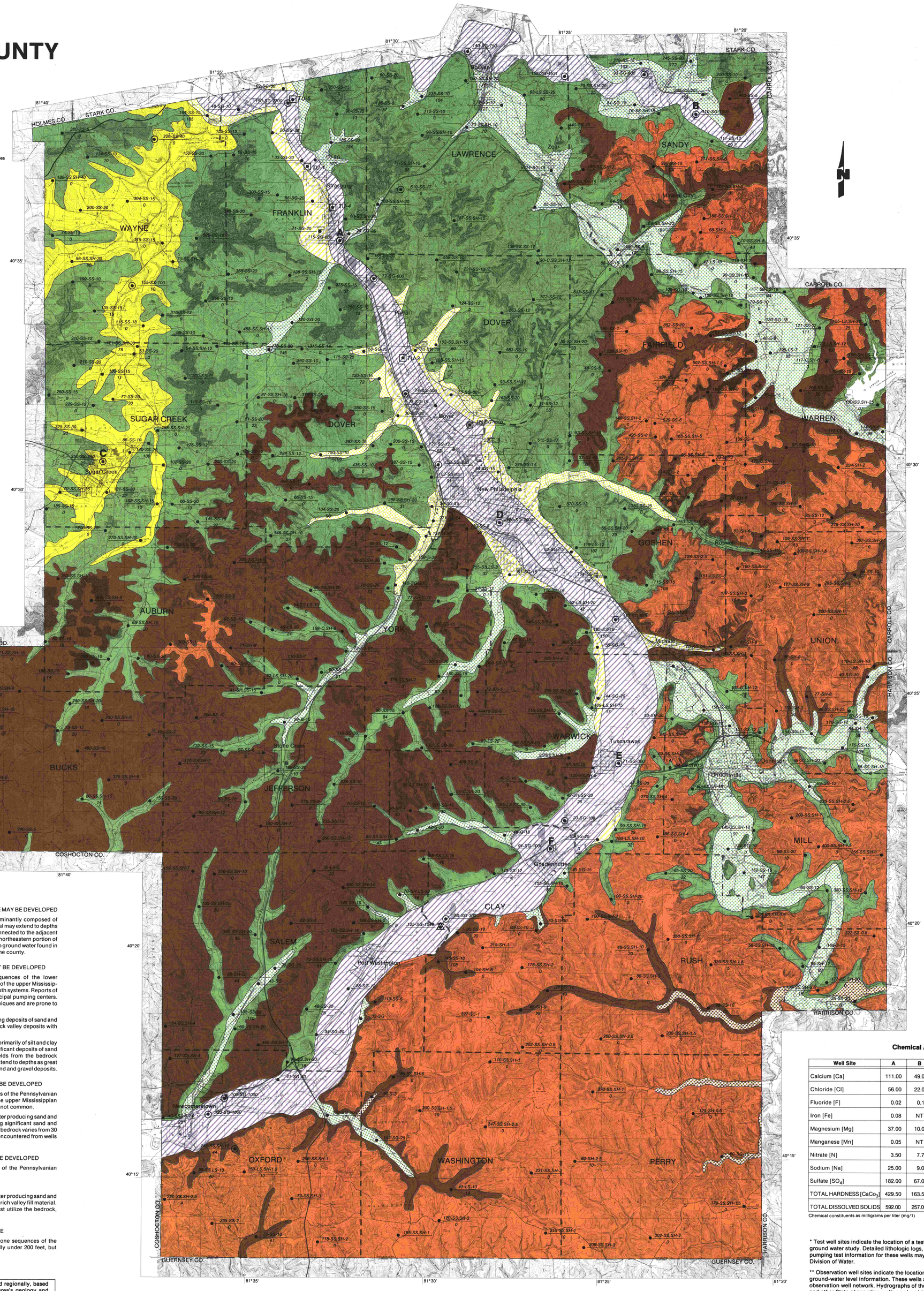
CONTOUR INTERVAL 20 FEET

County Line

Township Line

Incorporated City Limit

Glacial Boundary



Well Site Symbols

WELL INFORMATION
(SEE NOTE)

AQUIFER TYPE
Water bearing formation.

DEPTH (ft.)
Total depth of well in feet.

YIELD (gpm)
Amount of water a well produces in gallons per minute.

WELL SITE
Approximate location of a well.

75-SS-20
26

DEPTH TO BEDROCK (ft.)
Depth to bedrock in feet.

WELL TYPES

- Well Site
- Municipal-Industrial Well
- Observation Well**
- Test Well*
- A Chemical Analyses

AQUIFER TYPES

S - Sand
G - Gravel
SG - Sand and Gravel
SS - Sandstone
SH - Shale
LS - Limestone
C - *Coal*

Well Yields

AREAS IN WHICH YIELDS OF MORE THAN 500 GALLONS PER MINUTE MAY BE DEVELOPED

Ground water is obtained from valley fill material that is predominantly composed of coarse, permeable, sand and gravel deposits. The valley fill material may extend to depths as great as 290 feet. In most areas this aquifer is hydraulically connected to the adjacent river. Ground water obtained from these deposits in the extreme northeastern portion of Tuscarawas County are known to be of poorer quality compared to ground water found in similar valley fill deposits of comparable yield in other areas of the county.

AREAS IN WHICH YIELDS OF 25 TO 100 GALLONS PER MINUTE MAY BE DEVELOPED

Wells are developed in the sandstone, shale, limestone sequences of the lower Pennsylvanian system and/or in the sandstone, shale sequences of the upper Mississippian system. For maximum yields wells should be developed in both systems. Reports of yields as high as 350 gpm have been recorded at industrial/municipal pumping centers. These high yields are obtained by special well development techniques and are prone to have high iron concentrations.

Ground water is usually obtained from valley fill material containing deposits of sand and gravel. These areas are hydraulically connected to extremely thick valley deposits with yields over 500 gpm.

Ground water may be obtained from valley fill material consisting primarily of silt and clay with local lenses of sand and gravel. Wells not encountering significant deposits of sand and gravel must be developed in the underlying bedrock. Yields from the bedrock generally range from 10 to 25 gallons per minute. Valley fill may extend to depths as great as 160 feet. Test drilling is recommended to locate the coarsest sand and gravel deposits.

AREAS IN WHICH YIELDS OF 10 TO 25 GALLONS PER MINUTE MAY BE DEVELOPED

Wells are developed in the sandstone, shale, limestone sequences of the Pennsylvanian system and sometimes in the sandstone, shale sequences of the upper Mississippian system. Well depths of over 300 feet have been recorded but are not common.

Available information suggests the possibility of encountering water producing sand and gravel deposits within valley fill material. Wells not encountering significant sand and gravel deposits are developed in the underlying bedrock. Depth to bedrock varies from 30 to 180 feet. Yields of less than 25 gallons per minute are normally encountered from wells developed in the bedrock.

AREAS IN WHICH YIELDS OF 3 TO 10 GALLONS PER MINUTE MAY BE DEVELOPED

Wells are developed in sandstone, shale, limestone sequences of the Pennsylvanian system. Well depths vary from 30 feet to over 400 feet.

Available information suggests the possibility of encountering water producing sand and gravel lenses which are highly localized and interbedded in a clay rich valley fill material. Wells not encountering coarse deposits of sand and gravel, must utilize the bedrock, which generally yields less than 10 gpm.

AREAS IN WHICH YIELDS SELDOM EXCEED 3 GALLONS PER MINUTE

Meager supplies are developed in sandstone, shale, and limestone sequences of the middle to lower Pennsylvanian system. Well depths are generally under 200 feet, but some extend to over 300 feet.

Note

The ground-water characteristics have been mapped regionally, based upon interpretations of water well records and the area's geology and hydrology. Well sites mapped were selected as typical for the areas shown. Information regarding specific sites may be obtained from the Division of Water.

Chemical Analysis Table

Well Site	A	B	C	D	E	F
Calcium [Ca]	111.00	49.00	62.00	126.00	117.00	85.00
Chloride [Cl]	56.00	22.00	16.00	89.00	70.00	41.00
Fluoride [F]	0.02	0.10	0.30	0.12	0.02	NT
Iron [Fe]	0.08	NT	1.30	0.19	0.46	0.64
Magnesium [Mg]	37.00	10.00	21.00	27.00	32.00	17.90
Manganese [Mn]	0.05	NT	0.26	NT	0.28	0.37
Nitrate [N]	3.50	7.70	NT	0.40	0.60	<0.10
Sodium [Na]	25.00	9.00	61.00	32.00	35.00	24.00
Sulfate [SO_4]	182.00	67.00	104.00	145.00	191.00	126.00
TOTAL HARDNESS [$CaCo_3$]	429.50	163.50	241.10	425.70	423.70	285.90
TOTAL DISSOLVED SOLIDS	592.00	257.00	NT	NT	612.00	482.00

Chemical constituents as milligrams per liter (mg/1) NT Not Tested

* Test well sites indicate the location of a test well that was part of a regional ground water study. Detailed lithologic logs, water quality analysis and pumping test information for these wells may be available from ODNR-Division of Water.

** Observation well sites indicate the location of wells used to collect ground-water level information. These wells are part of the State observation well network. Hydrographs of the water levels recorded in these and other State observation wells can be obtained through ODNR-Division of Water.

Published 1989
Ohio Department of Natural Resources
Division of Water
Ground-Water Resources Section
1939 Fountain Square
Columbus, Ohio 43224

Total copies printed: 500
Unit cost: $9.400
Publication date: 1/89

ODNR OHIO DEPARTMENT OF NATURAL RESOURCES
Richard F. Celeste Governor
Joseph J. Sommer Director
"Naturally OHIO the heart of it all"

David S. Orr, Cartographer