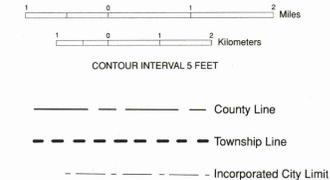


Ground Water Resources of DELAWARE COUNTY

by
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after Schmidt, James J., 1979



- ### Well Yields
- AREAS IN WHICH WELLS YIELD 100, OR MORE, GALLONS PER MINUTE**
- Principal aquifer is the limestone bedrock. Although yields in excess of 1500 gallons per minute have been developed at depths of up to 400 feet, regional yields are generally less than 500 gallons per minute. Farm and domestic supplies of up to 20 gallons per minute can usually be developed at depths of less than 100 feet.
 - Wells cased through upper zones of shale and limestone seal off less desirable water and allow a better quality water to be developed from a deeper limestone formation.
 - Permeable layers of sand and gravel deposited in buried valleys adjacent to the Olenitangy River, Alum Creek, and Big Walnut Creek. Water bearing zones may range from 30 to 125 feet deep and yield in excess of 200 gallons per minute.
- AREAS IN WHICH WELLS YIELD 25 TO 100 GALLONS PER MINUTE**
- Sand and gravel lenses interbedded in clay are capable of yielding 25-75 gallons per minute. Water bearing zones may be less than 10 feet thick and should be properly screened to develop maximum yields.
- AREAS IN WHICH WELLS YIELD 10 TO 25 GALLONS PER MINUTE**
- Principal aquifer is a sandstone unit which underlies 10-70 feet of clayey till. Typical yields are 10-20 gallons per minute at depths of less than 120 feet. Hydrogen sulfide is sometimes encountered as noted in the analysis of well site O.
 - Thin lenses of sand and gravel interbedded in thick layers of clay and silt. Domestic and farm supplies are generally available to properly drilled and screened wells. Average well depths are 100 feet or less, although wells as deep as 240 feet are possible in Harlem and Trenton Townships.
- AREAS IN WHICH WELLS YIELD 3 TO 10 GALLONS PER MINUTE**
- Sandstone and sandy shale bedrock overlain by 5-50 feet of clay. Additional storage capacity may be necessary to meet peak daily water demands. Hydrogen sulfide is sometimes encountered.
 - Thin lenses of sand and gravel within clay can potentially supply 3-10 gallons per minute from depths of less than 65 feet.
 - Glacial moraine deposits ranging from 30 to 90 feet thick. The thin lenses of water-bearing sand and gravel interbedded in fairly thick layers of clay-rich till are the only source for domestic supplies above the shale bedrock. If permeable sand and gravel is not encountered above the limestone or sandstone formations, wells may be deepened to develop adequate supplies.
- AREAS IN WHICH WELLS YIELD LESS THAN 3 GALLONS PER MINUTE**
- Clay overlying impermeable shale bedrock yields meager, often inadequate supplies of ground water. Dry holes are not uncommon. Additional storage tanks or hauled water may be necessary to provide sufficient water for daily use.
 - Wells drilled through the shale to the underlying limestone have produced yields of up to 600 gallons per minute of poor quality water. See chemical analysis sites G, H, and I. Domestic wells are less than 100 feet deep and yield minimal quantities of sulfurous water.

Well Site Symbols

WELL INFORMATION
(SEE NOTE)

DEPTH (ft.)
Total depth of well in feet

WELL SITE
Approximate well location

WELL TYPES

- Well Site
- Municipal-Industrial Well
- Observation Well Site
- Test Well**

WELL INFORMATION EXAMPLE

75-SS-20
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DEPTH TO BEDROCK (ft.)
Depth to bedrock in feet.

AQUIFER TYPE
Water-bearing formation

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

AQUIFER TYPES

- S - Sand
- G - Gravel
- SG - Sand & Gravel
- SS - Sandstone
- SH - Shale
- LS - Limestone

A Chemical Analyses

*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.

**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.

Chemical Analysis Table

Well Site	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Depth (Feet)	350	370	350	400	225	445	395	350	335	494	62	65	38	150	75
Iron (Fe)	0.58	0.40	0.94	0.98	1.70	-	29.00	-	0.60	8.80	4.00	16.00	0.11	6.00	2.3
Hardness as CaCO ₃	550	440	780	850	1630	-	2100	310	1820	4100	649	2160	374	1760	866
Dissolved Solids	684	494	934	1070	2180	-	2640	746	2320	16000	788	2800	407	3281	1410
Sulfate (SO ₄)	250	130	440	530	1380	-	1700	37	1460	22	348	1740	70	-	549
Hydrogen Sulfide (H ₂ S)	0.2	0.0	7.0	0.0	7.0	-	0.3	-	0.3	-	-	-	-	-	12.0
Sodium (Na)	21	8.5	8.3	25	49	-	20	8	33	4470	11	23	2.3	-	150
Chloride (Cl)	17	3	10	10	4	4400	13	10	9330	6	78	4	10	-	120
Aquifer	Lime-stone	Sand & Gravel	Sand & Gravel	Lime-stone	Sand-stone	-	-								

Chemical constituents as milligrams per liter (mg/l)

NOTE

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

