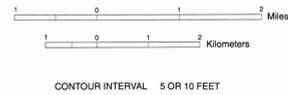
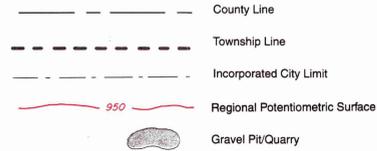


Ground Water Resources of WILLIAMS COUNTY

by
William C. Haiker



CONTOUR INTERVAL 5 OR 10 FEET



Well Yields

- AREAS IN WHICH YIELDS IN EXCESS OF 500 GALLONS PER MINUTE MAY BE DEVELOPED**
- Thick, permeable sand and gravel deposits capable of yielding up to 1000 gallons per minute from large diameter, properly constructed wells 85 to 165 feet deep. Extensive test drilling may be necessary to locate sufficiently permeable deposits for maximum yields.
- AREAS IN WHICH YIELDS OF 100 TO 500 GALLONS PER MINUTE MAY BE DEVELOPED**
- Regionally extensive glacial deposits of sand and gravel interbedded within layers of clay may yield up to 500 gallons per minute from properly drilled and screened wells. The total thickness of these glacial deposits ranges from 100 to 250 feet.
- Flowing wells have been noted in these areas.
- AREAS IN WHICH YIELDS OF UP TO 10 GALLONS PER MINUTE MAY BE DEVELOPED**
- Predominantly clay, some silty and sandy, above shale bedrock may yield up to 10 gallons per minute. Thin, localized sand and gravel lenses may yield up to 50 gallons per minute. Wells completed in the shale bedrock generally yield less than 5 gallons per minute. Dry holes, methane, and hydrogen sulfide are sometimes encountered. Drilling through the shale to limestone at depths of up to 500 feet may yield up to 150 gallons per minute of poor quality water.

Chemical Analysis Table

Well Site	A	B	C	D	E
Aquifer Type	Sand & Gravel				
pH	7.7	7.7	7.6	7.4	7.5
Calcium (Ca)	82	75	78	—	—
Chloride (Cl)	8.5	11	20	6	176
Fluoride (F)	0.8	0.8	0.9	0.2	1.1
Magnesium (Mg)	34	27	36	—	—
Dissolved Solids	399	360	494	376	607
Hardness as CaCO ₃	345	298	342	314	246
Sulfate (SO ₄)	11	17	—	—	—
Iron (Fe)	—	—	4.0	3.0	0.6

All constituents reported as parts per million

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**

AQUIFER TYPES

- CL - Clay
- S - Sand
- G - Gravel
- SG - Sand & Gravel
- SH - Shale
- LS - Limestone

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

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

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.

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.

