Table 8. *(Continued)*

Constituent or property	Source or cause	Significance[2]
Hardness (as $CaCO_3$)	In most waters nearly all of the hardness is due to calcium and magnesium. All of the metallic cations other than the alkali metals also cause hardness. There are two classes of hardness — carbonate (temporary) and noncarbonate (permanent). Carbonate hardness refers to the hardness resulting from cations in association with carbonate and bicarbonate; it is called temporary because it may be removed by boiling the water. Noncarbonate hardness refers to that resulting from cations in association with other anions.	Hardness consumes soap before a lather will form and deposits soap curds on bathtubs. Carbonate hardness is the cause of scale formation in boilers, water heaters, radiators, and pipes, resulting in a decrease in heat transfer and restricted flow of water. Waters of hardness up to 60 mg/L are considered soft; 61 to 120 mg/L, moderately hard; 121 to 180 mg/L, hard; and more than 180 mg/L, very hard. Very soft water that has a low pH may be corrosive to plumbing. The number of milligrams per liter divided by 17.1 yields the concentration in grains per gallon.
Dissolved solids — A measure of all of the chemical constituents dissolved in a particular water. The maximum limit recommended for drinking water is 500 mg/L, but water containing up to 1,000 mg/L may be used where less mineralized supplies are not available.		
Specific conductance (micromhos at 25° C) — A measure of the capacity of a water to conduct an electrical current. It varies with concentration and degree of ionization of the constituents. May be used to obtain a rapid estimate of the approximate dissolved-solids content of water.		
pH — The negative logarithm of the hydrogen-ion concentration. A pH of 7.0 indicates neutrality of a solution. Values higher than 7.0 denote alkaline solutions; values lower than 7.0 indicate acidic solutions. Corrosiveness of water generally increases with decreasing pH. The pH of most natural water ranges between 6 and 8.		
Temperature — The temperature of groundwater that occurs between the water table and about 60 feet below the water table is approximately the same as the average annual air temperature (Lovering and Goode, 1963, p. 5); below this point, groundwater temperatures increase with depth about 1° F for each 50 to 100 feet.		

[1] Lloyd and Growitz (1977), p. 51-54.
[2] Recommended drinking-water limits are from U.S. Environmental Protection Agency (1975, 1977).
[3] Ward and Wilmoth (1968), p. 20-22.
[4] U.S. Environmental Protection Agency (1976), p. 10.

Table 9. *Median Chemical Analyses of Groundwater from the Appalachian Plateaus Physiographic Province*

(Concentrations are in milligrams per liter, except where noted)

Group or Formation	Number of samples	pH (units)	Arsenic (As)	Aluminum (Al)	Alkalinity ($CaCO_3$)	Cadmium (Cd)	Calcium (Ca)	Chloride (Cl)	Chromium (Cr)	Dissolved solids	Fluoride (F)	Hardness ($CaCO_3$)	Iron (Fe)	Lead (Pb)	Manganese (Mn)	Magnesium (Mg)	Nickel (Ni)	NH_4 as N	NO_2 as N	NO_3 as N	Potassium (K)	Sodium (Na)	Sulfate (SO_4)	Zinc (Zn)
Alluvium	14	7.4	<.005	.08	123	<.0002	31.2	8	<.01	216	.10	102	.38	<.005	.21	6.7	.01	.03	.002	.12	1.23	9.2	15	.04
Pottsville Group	5	6.5	<.005	.07	14	<.0002	5.2	4	.01	52	<.10	20	.27	.011	.03	1.5	.03	.01	.002	.22	.50	2.6	<5	.03
Mauch Chunk Formation	17	6.5	<.005	.07	50	.0003	25.2	13	<.01	160	<.10	82	.10	.007	.01	2.3	.01	.01	.002	2.02	.34	5.7	10	.03
Huntley Mountain Formation	1	6.5	<.005	.07	54	<.0005	12.5	3	<.01	64	<.10	52	3.02	<.005	1.55	3.7	<.01	.04	.004	.12	.82	3.7	<5	.53
Catskill Formation	163	7.6	<.005	.10	106	<.0002	28.1	4	<.01	158	.10	90	.07	<.005	.02	5.5	.01	.01	.002	.30	1.02	10.1	10	.02
Trimmers Rock Formation	9	6.9	<.005	.09	86	<.005	19.2	3	<.01	172	.16	80	.11	<.005	.07	6.3	.01	.09	.002	.04	.44	11.7	15	.02
Lock Haven Formation	37	7.7	<.005	.12	174	<.0002	39.9	5	<.01	230	.17	123	.23	<.005	.06	10.6	.01	.15	.002	.02	2.60	32.3	15	.03

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