

Annual rainfall, ranging from 33 inches in the south to 37 inches in the north on the more permeable, sandy soils of the outcrop, provides recharge estimated to be equivalent to less than one inch per year (Nordstrom, 1982). Other sources of recharge include surface-water seepage from lakes and streams such as Lake Grapevine, Garza-Little Elm Reservoir, and the Trinity River tributaries. Discharge occurs naturally through springs, seeps, and evapotranspiration. Artificial discharge due to heavy municipal and industrial pumpage in the Sherman-Denison area has contributed to water-level declines in excess of 100 feet. Except in areas of heavy pumpage, the ground-water potentiometric surface generally parallels the east-southeast dip of the beds.

WATER QUALITY

Samples were taken from municipal, industrial, and irrigation wells where possible. These wells, because of their constant pumping and high yield, draw water from larger areas in the aquifer and thereby ensure a representative sample. Environmental quality specialists took field measurements and used appropriate sampling techniques as described in the TWDB *A Field Manual for Ground Water Sampling* (Nordstrom and Beynon, 1991) for dissolved inorganic constituents, nutrients, and, for the first time in this aquifer, radioactivity. Constituent ranges and averages as determined by the Texas Department of Health Laboratory are discussed, and areas in which key constituents are in excess of maximum contaminant levels (MCLs) are illustrated in maps where appropriate. The primary and secondary MCLs, as set by the Texas Natural Resource Conservation Commission (TNRCC), are listed in Table 1.

Primary Constituent Levels		
Constituent	Symbol	MCL
Arsenic	As	0.05 mg/l
Barium	Ba	2.0 mg/l
Cadmium	Cd	0.005 mg/l
Chromium	Cr	0.10 mg/l
Fluoride	F	4.0 mg/l
Lead	Pb	0.015 mg/l
Mercury	Hg	0.002 mg/l
Nitrate (as N)	NO ₃ (N)	10.0 mg/l
Selenium	Se	0.05 mg/l
Gross Alpha	α	15 pCi/l
Gross Beta	β	50 pCi/l
Radium	Ra ²²⁶ + Ra ²²⁸	5 pCi/l
Secondary Constituent Levels		
Chloride	Cl	300 mg/l
Copper	Cu	1.0 mg/l
Fluoride	F	2.0 mg/l
Iron	Fe	0.3 mg/l
Manganese	Mn	0.05 mg/l
pH		≥7.0
Silver	Ag	0.10 mg/l
Sulfate	SO ₄	300 mg/l
Dissolved Solids	TDS	1,000 mg/l
Zinc	Zn	5.0 mg/l

Table 1. Drinking water standards for selected inorganic constituents and radioactive species as set by the TNRCC.