

Figure 15. Concentrations of trichloroethene and tetrachloroethene in ground water at selected municipal wells in Belvidere, Ill., 1985–94.

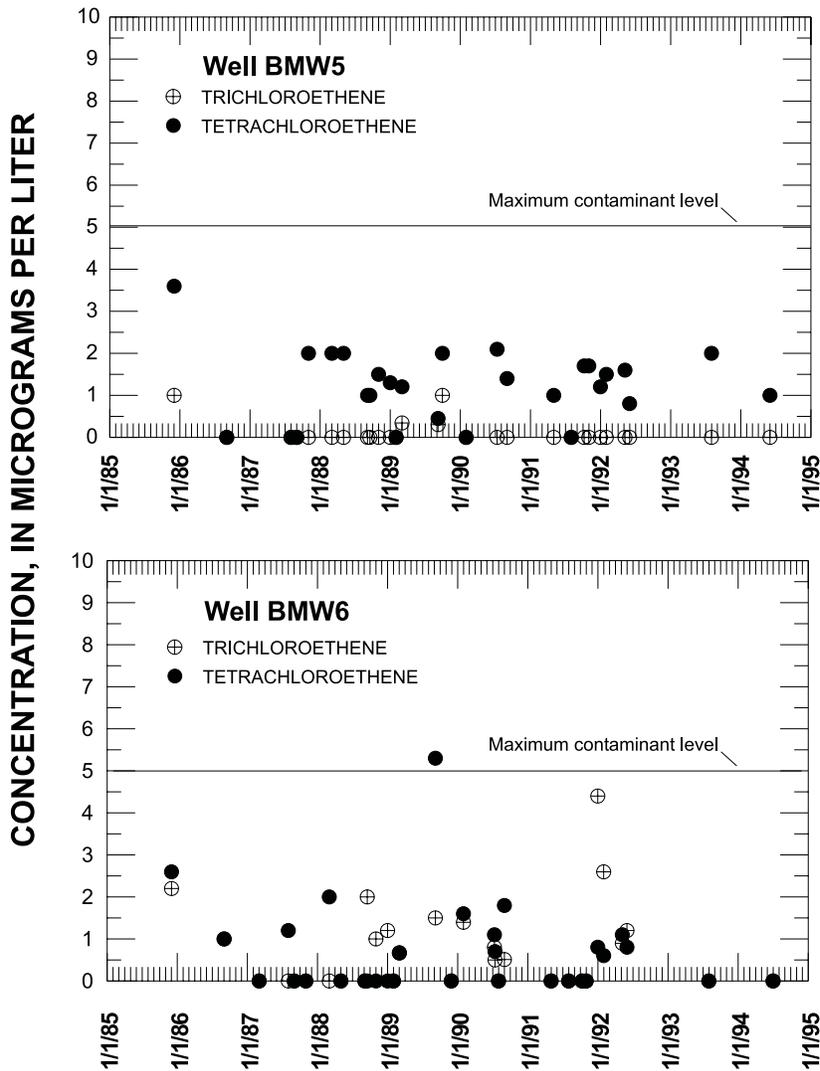


Figure 15. Continued.

Several factors may account for the limited movement of trace metals and SVOC's in ground water. Sorption likely restricts the mobilization of the trace metals (Science Applications International Corporation, 1992). Ion exchange within the organic materials and fine-grained sediments, primarily clay, in the glacial deposits that compose the unsaturated zone and glacial drift aquifer restrict movement of trace metals. Under appropriate hydrogeologic and aqueous-chemical conditions, fixation by precipitation reactions also may account for the limited movement of trace metals. Fixation is controlled primarily by the aqueous chemistry and the Eh of the soil- or ground-water system. Fixation is most likely to occur in soil- and ground-water systems with high concentrations of trace

metals, such as the shallow glacial drift aquifer underlying the hazardous-waste sites.

The mobilization of SVOC's may be restricted by their low solubility and propensity for sorbing to organic materials and fine-grained sediments, primarily clay (Science Applications International Corporation, 1992). Organic materials and fine-grained sediments are readily available in the glacial deposits in the study area. Although usually a slow process, biodegradation in the biologically active parts of the glacial drift aquifer also may limit the concentrations of SVOC's that move to the deeper bedrock aquifers, where biological activity is lower. Although there is no current evidence of such conditions in the study area, chemical oxidation in waters with sufficient concentrations of chlorine or ozone also may be an important