Limitations of Individual Sewage Disposal Systems

Depth to Water Table or Impermeable Layer

- Clear link between vertical separation of Effluent Disposal Area (EDA) and the seasonal high water table or impermeable layer (Humphrey et al., 2015; Humphrey et al., 2011; Pfluger et al., 2009; Meeroff, 2008; Mallin et al., 2004; Van Cuyk et al., 2004) (Figure 1).
- Two to five feet of aerated soil below the bottom of the EDA required for adequate treatment.
- **Though the depth to the water table and impermeable layer is not known at all locations in the Parsons Creek watershed, many of the soil types are characterized by having seasonally shallow water tables (Table 1).**

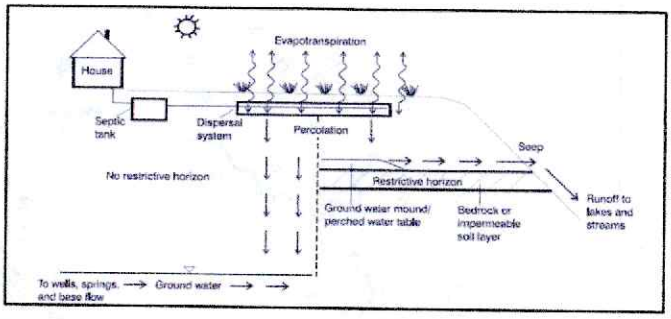

Figure 1 - ISDS in area with and without adequate distance below the Effluent Disposal Area

Soil Percolation Rates

- The soil percolation rate, or rate at which water can be absorbed into the soil, is an indicator of how well a specific type of soil will treat pollutants.
- Soils are considered unsuitable for ISDS if percolation rates are too slow (> 60 minutes/inch) or too fast (< 1 minute/inch) (Harrison et al., 2000; Otis et al., 1980, pg. 214).
- **The Soil Conservation Service (1994) ranks essentially all of the soils in the watershed as "severe" and poorly suitable for onsite wastewater disposal. Treatment is possible for some of these soil types in areas where the depth to bedrock or the SHWT is or can be made sufficiently large (Figure 2, Table 1).**

Proximity to Surface Waters and Wetlands

- Plumes of pollutants below the EDA have been shown to range from 30 to 300 feet depending on soil conditions and distance to water table and/or bedrock (Schneeberger et al., 2015; Scandura and Sobsey, 1997; MPCA, 1999).
- **Of the 843 parcels in the Parsons Creek watershed, 383 parcels are within a 100-foot buffer of a surface water body or wetland. 357 parcels are within 75 feet and 331 parcels are within 50 feet (Figure 3).**

The Number of ISDS in the Watershed

- Too many ISDS in an area may overwhelm the area's carrying capacity for treatment as individual plumes may intermingle and pollute large areas of groundwater.
- A density of more than 0.26 septic tanks per acre has been shown to lead to fecal contamination (Malin, 2004; Yates, 1985).
- **In the Parsons Creek watershed, the density was estimated to be 0.45 ISDS per acre.**