

Chapter 0

Volatilization

is the transfer of chemicals from solids or liquids to the characteristics. volatilization . . . Volatilization, or evaporation, gaseous phase. Depending on the contaminant and site for the loss of hazardous compounds from soils and concentration of the wastes at a can be an important mechanism will liquid waste systems. Volatilization may decrease the because of the law of mass conservation, contaminants air emissions from contaminated facility or site; however, the subsequently be found in the atmosphere. Therefore, waste management facilities, which are regulated under and result in short- or sites and RCRA hazardous Clean Air Act, may become hazardous air pollutants (HAPs) Volatilization can also be applied as a hazardous waste treat-

through air stripping and to re- long-term health effects.

ment process to clean up contaminated groundwater vapor extraction. The fundamental principles covered in this and the design of treatment systems that mediate soils by soil in Chapters 12 chapter serve as a basis for process selection volatilization. These design applications will be introduced promote and 13.

it will do so primarily as a function of the contaminant's va- form) and the Henry's Law con- If volatilization occurs, will por pressure (if the compound is in relatively pure aqueous solution). In this chapter, these two physical properties release volatilization calculations are presented: stant (if it is in soil surface, and (3) first be described before three source volatilization from an open container; (2) volatilization from a These calculations serve as a basis for the (1) chemicals in the at- volatilization from deep soil contamination. models covered in Chapter 8 that describe the path of volatile mosphere after they are released from the source.

VAPOR PRESSURE

6.1 THE GOVERNING VARIABLES: AND HENRY'S LAW

of a pure compound is a function of its vapor pressure; con- the pressure exerted by a chemical on *Vapor Pressure*. Volatility pressure against ceptually, *vapor pressure* may be thought of as

Compounds with higher vapor pressures exert more increased driving force for volatilization. Vapor the atmosphere. Hg to 760 mm Hg at 20°C. the atmosphere and, as a result, an pressures of organic compounds range from 10^{-10} mm with temperature; the temperature at which a compound's (760 mm Hg) is the boiling point of the Vapor pressure increases by vapor pressure reaches atmospheric pressure between vapor pressure and temperature is described compound. The relationship