

Environmental Chemistry: Definitions

Contaminant - a substance present in greater than the usual (normal) concentration.

Pollutant - a contaminant which has a detrimental effect upon its environment (or something of *value* within it). A pollutant can be *anthropogenic* (human made) or from a natural source.

Source - every pollutant originates from a source. Identifying the source is very important since the most efficient remediation can usually be achieved at this location. Point sources are often easy to identify as they are often associated with a specific industry or activity. Non-point sources give rise to a more diffuse pollutant loading and can be more difficult to identify and remediate.

Receptor - anything that the pollutant acts upon.

Reservoir or Compartment - a region or unit within the environment in which a substance resides and mixes. The atmosphere, oceans and other water bodies are reservoirs for many substances. When the concentration of a substance within a reservoir does not appear to change, the rate of inflow = rate of outflow and the situation is said to have reached a *steady-state*.

Sink - a longer term reservoir in which a substance is essentially immobilized. Such a repository may be natural or human-made. The oceans and ocean sediments are a sink for many of the dissolved species present in freshwater.

Residence time – is the average amount of time a substance spends in a particular compartment or reservoir. It is defined numerically as the steady-state amount of material in a reservoir divided by its total rate of inflow (or outflow).

$$\text{Residence time} = \frac{\text{steady-state amount of substance in the reservoir}}{\text{rate of inflow to (or outflow from) reservoir}}$$

The numerator of this equation will have units expressing amount, such as grams, moles per liter, m³ or tonnes while the denominator will have units of amount per time, such as grams per second, moles per liter per minute, m³ per day or tonnes per year. The units should be chosen to be compatible, so that the amount of substance cancels and the final quantity has units of time.