

Atmospheric Sources of Tritium and Potential Implications to Surface and Groundwater Monitoring Efforts

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Recent focus on tritium in groundwater requires an understanding of potential natural and man-made sources of tritium in the environment. This presentation will discuss the occurrence of naturally-produced tritium in the atmosphere, as well as that generated from nuclear weapons testing during the 1950s through 1970s. Both sources result in detectable tritium in precipitation, which can vary depending on time of year and geographic location, and the effect of these factors on expected concentrations will be discussed. The concept of the "tritium unit" as a standard measurement of tritium in precipitation, surface water, and groundwater will be presented.

This presentation will also address implications of atmospheric tritium as a source for measurable concentrations of tritium in surface water, storm water, and groundwater monitoring efforts. Airborne releases of tritium in the form of tritiated water vapor have been characterized at all operating nuclear power plants. Often, such airborne tritium is re-condensed to the liquid form by building air conditioning units, which are often routed to sanitary or storm water drain systems. Airborne tritium can also be subject to localized precipitation "washout", and concentrations of tritium resulting from washout events are highly dependent on meteorology during the precipitation event. Such washout events have the potential to result in high concentrations in surface water, storm water, and groundwater in the immediate vicinity of the power plant. Such detectable levels could easily be mistaken as arising from a different source term, such as a leaking pipe.