

Issues in Monitoring Hazardous Chemicals in Stormwater Runoff/Discharges From Superfund and Other Hazardous Chemical Sites

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Deficiencies in design and execution render stormwater-runoff monitoring programs for many hazardous chemical sites inadequate for assessing the potential environmental quality and public health impacts of chemicals in the runoff. Two pervasive problems are the use of analytical methods that are inadequate for measuring certain hazardous chemicals at potentially hazardous concentrations, and the application of "criteria/standards" that are inappropriate for evaluating the environmental/public health impacts of chemicals. These concerns are most notable for carcinogens and chemicals that bioaccumulate in edible aquatic organisms, including arsenic, chromium, beryllium, mercury, dioxins, organochlorine pesticides (such as DDT), and polychlorinated biphenyls; unrecognized pollutants; and nanomaterials. In order to appropriately evaluate whether the runoff/discharge from a hazardous chemical site is a threat to human health, the analytical methods must be sufficiently sensitive in critical concentration ranges; sampling regimens need to be sufficiently rigorous to provide reliable characterization of the content of the runoff, receiving water, and, for bioaccumulatable chemicals, levels in edible organisms in receiving water. Proper sampling and analysis will then provide data to enable the appropriate criteria/standards to be applied. © 2010 Wiley Periodicals, Inc.

INTRODUCTION

For more than 45 years, the authors have been involved in conducting studies of the water-quality and public health impacts of potentially hazardous chemicals in waste management/disposal areas (e.g., landfills and waste ponds), and in industrial areas where potentially hazardous materials/chemicals have been manufactured, used, or spilled. At such sites, there is concern about releases of chemicals from the site through stormwater runoff/discharge and the associated pollution of groundwater and surface water. However, in the authors' experience, in some situations inadequate attention has often been given by site investigators and regulatory agency staff to the design and conduct of studies; owing to deficiencies in their design and execution, many investigations cannot be reasonably expected to provide a reliable assessment of the potential environmental quality and public health impacts of chemicals in surface-water runoff from the area, as well as in groundwaters that are impacted by past waste/chemical disposal/management.

