Managing Waste and Contaminated Soils

What’s New?

This month’s issue is the first in a two-part series that spotlights new developments concerning the sustainable management of waste, landfills, and contaminated soils. Look for Part Two next month.
Let’s begin this waste-themed issue with a very brief historical perspective on waste management, some of which many of our younger readers may find difficult to believe. Comprehensive U.S. federal regulation of solid and hazardous waste first began more than 40 years ago when Congress passed the Resource Conservation and Recovery Act (RCRA) of 1976, followed by an update eight years later in 1984. EM readers who are currently in the early- to mid-stages of their careers are too young to remember the pre-RCRA era in which all waste was assumed to just “go away.” Into the early 1970s, there was essentially no recycling or reuse of discarded materials; solid waste was either burned in open municipal dump piles or backyards, or was buried in municipal dumps having no environmental protection.

For example, in New York City, through the mid-1900s, waste was simply barged out to sea and dumped, and the city’s sewage sludge was committed to the ocean depths until 1992! In the pre-RCRA era, factories discharged their toxic waste directly to the ground or into rivers without any controls.

Your author, of a certain age, can recall back in that pre-enlightenment era, going to the town sandpit to drain and change his car’s motor oil (the old oil “went away,” there, didn’t it?); playing “finger hockey” with blobs of mercury on the slate tops of lab benches during high school chemistry class; marveling as the local river flowed blue, yellow, or red, depending on the color dye discharged daily by the local paper mills; and “exploring” the dumping area behind the local factory, including all those barrels of who-knows-what. Unbelievable by today’s standards, but the norm in those days.

The passage of RCRA four decades ago coincided with a rapidly increasing public interest in environmental stewardship. Over the ensuing years, steady progress has been made in reducing the amount of waste generated; reusing and recycling discarded materials; and treating and disposing of the remaining waste in environmentally protective ways. This is true for all types of waste: municipal, industrial, and hazardous.

William McDonough, a former Federal Reserve Chair in New York, once said, “You don’t filter smokestacks or water. Instead, you put the filter in your head and design the problem out of existence.” This perspective on preventing, rather than controlling air and water pollution extends to conceiving ever-better means for waste reduction and sustainable waste management.

In that spirit, this month’s issue of EM provides readers the opportunity to learn of several methods and concepts for more responsibly managing our waste. Included in this issue are two articles on the management of contaminated soils, two on municipal landfill issues, and one on the link between waste management on one hand, and food, energy, and water resources on the other.

In the first article, Tim Haley and Tammy Helminski address how to avoid legal and cost liabilities that can ensue with improper disposition of the “dirt” excavated in the course of normal site development projects. Next, in a follow-up to his article published in the March 2017 EM, David Greene provides a timely status update on the new landfill air rules following the change in U.S. Environmental Protection Agency (EPA) leadership and offers compliance recommendations to landfill owners.

The third article, by Stephen Zemba and David Adams, considers the reuse of contaminated soils as landfill. At large landfills, contaminated soils are often used beneficially as daily cover material to cover up each day’s deposits of wastes, rather than using virgin soils to cover the waste. Despite the benefits of using contaminated soils for this purpose, there are potential risks to the landfill workers who apply these soils, and this article provides a useful primer on techniques for assessing those health risks.

Commercial development of former landfill sites often requires a sub-slab mitigation system to prevent the intrusion of sub-surface gases, such as methane and volatile organic compounds (VOCs), into the new structures. In the fourth article this month, Deran Pursoo, Dave Folkes, and Ted Kuehster describe early experience with an innovative, “green,” sub-slab mitigation system constructed of recycled-plastic domes.

The final article broadens our thinking about waste management sustainability. Qingshi Tu, David Palmer, and Ting Lu address the inextricable link that exists among the food, energy, and water sectors, defining this as the “Food–Energy–Water (FEW) Nexus.” The article then illustrates how the recovery and reuse of waste materials can be strategically integrated within the nexus, improving its sustainability.

EM readers are invited to enjoy this issue, while updating on recent developments in sustainable waste management. The focus on waste continues next month with a look at effective approaches for managing contaminated soils and spent electric-vehicle batteries.

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