HAZARDOUS MATERIALS IN NATURAL DISASTER DEBRIS

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Abstract: Natural and man-made disasters result in large volumes of debris that can overwhelm existing solid waste management systems (Harrington and Mabie 1997; Tandy 1996). One example was the 1995 Hyogeng-Nambu Earthquake near Kobe Japan (Hayashi and Katsumi 1996). It was 150% larger than the average construction waste generated for the Kansai area and was about 30% of the annual construction waste, on average, generated for Japan. The Northridge Earthquake in California (1994) generated 7 million yd³ (Reinhart and McCreaner 1999) of debris. Hurricane Andrew (1992) for example, generated 43 million yd³ of debris in Metro Dade County, FL (Reinhart and McCreaner 1999). Hurricane Inike in Hawaii generated 5 million yd³. Hurricane Hugo generated 2 million yd³ of plant waste, which was on the order of 5 to 15 times the annual solid waste produced in both North and South Carolina (Reinhart and McCreaner 1999). The 118 million yd³ of debris produced by Hurricane Katrina makes it the largest debris cleanup project to date in the United States (Jadacki, 2007). These large fluxes mean that even conventional waste streams can become severe environmental hazards due to their large volumes. Furthermore, the large volumes can overwhelm existing landfill space, particularly those for hazardous wastes and municipal wastes. This study has identified a number of problem-causing materials commonly found in disaster debris, ranging from toxic air particles to animal carcasses and rotten food, to construction and demolition debris. Several research opportunities that may improve the management of these problems materials are basic research on chemistry of complex landfill wastes in order to reduce odor and toxic leachates, reduction of fine air particles through engineering practices, sensors to improve waste management, and production and dissemination of training materials, guidance documents and best management practices in order to coordinate the Corps of Engineers disaster response on a nationwide level.

Keywords: Debris, hazardous wastes, disasters, solid waste management systems

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