



Project Summary

Production and Management of Small-Quantity-Generator Hazardous-Waste in Florida

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Data are presented on the production and management of hazardous waste by approximately 20,000 small-quantity hazardous-waste generators (SQHWGs) in the state of Florida. SQHWGs are generators that produce less than 1,000 kilograms of hazardous-waste in a calendar month. These data were collected as part of the Florida Local-Government Hazardous-Waste Assessment Program and made available to us for analysis. There were approximately 117,000 metric tons of small quantity-generator (SQG) hazardous waste produced annually. Approximately half of this hazardous waste is managed using the following methods: recycling, treatment, and disposal in permitted hazardous-waste-management facilities. However, large quantities of this SQG hazardous waste are disposed of in sanitary landfills and discharged to public sewers and these facilities are typically not designed to handle hazardous waste. These data indicate that there are potential environmental and human-health problems associated with the management of SQG hazardous waste in Florida as well as throughout the U.S.A.

This Project Summary was developed by EPA's Environmental Monitoring Systems Laboratory, Las Vegas, NV, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

In order to address the issue of the small-quantity hazardous-waste generator (SQHWG), as well as other solid waste concerns, the Resource Conservation and Recovery Act (RCRA) was enacted in the United States in 1976 and was amended in 1984. The RCRA provides a legal framework for coordinating federal, state, and local-government solid waste management in the U.S.A. Subtitle D of the RCRA is concerned with waste-management facilities that are generally considered, or by regulations are defined as facilities that manage non-hazardous waste. Data on the production and management of small-quantity-generator (SQG) hazardous waste is needed in order to determine the problems associated with its generation and to formulate regulations that will minimize its impact on human health and the environment. This report characterizes the types and amounts of SQG hazardous waste produced and how it is managed by approximately 20,000 firms and agencies in the state of Florida.

The RCRA regulates the management of both hazardous and non-hazardous solid waste in the U.S.A. A SQHWG is defined in Section 260.10, Chapter 40 of the U.S. Code of Federal Regulations as "a generator that generates less than 1,000 kilograms of hazardous waste in a calendar month." The RCRA regulations, as of March 24, 1986, define two categories of SQHWGs: (1) those generating less than 100 kilograms of hazardous waste in a calendar month, and (2) those generating between 100-

1,000 kilograms of hazardous waste in a calendar month. According to federal regulations, SQHWGs that produce between 100-1,000 kilograms of hazardous waste in a calendar month must manage their waste at facilities designed and permitted under Subtitle C of the RCRA to accept hazardous waste. Generators that produce less than 100 kilograms of hazardous waste are not prohibited by federal regulations from disposing of their hazardous waste in Subtitle D facilities such as sanitary landfills.

Hazardous waste is defined in Part 261, Chapter 40 of the U.S.A. Code of Federal Regulations as waste that is characteristically either corrosive, reactive, ignitable or toxic. These four characteristics have been used by the U.S. EPA and others to develop lists of specific chemicals as well as process-waste streams that have been determined to be "hazardous."

Counties in the state of Florida vary considerably in geographic size, population, economic profile, geology, hydrology, and the number and types of waste-management facilities available in

each county. Because of this diversity, it is believed that the data on SQG hazardous waste produced in Florida are generally representative of the types and quantities of SQG hazardous waste produced as well as representative of the management practices used throughout the U.S.A.

Materials and Methods

The SQG hazardous-waste data presented in the report were collected as part of the Florida Local Government Hazardous Waste Assessment Program. The Florida Local Government Hazardous Waste Assessment Program requires all counties in Florida to conduct assessments of hazardous-waste-related activities in their jurisdictions under guidelines developed by the Florida Department of Environmental Regulation (FDER). An important component of each county assessment is a survey of SQHWGs. The survey data were collected utilizing questionnaires sent through the mail or completed during on-site interviews. The FDER coordinated the data collection activities of all

counties in order to maintain consistency in the survey effort. These data were collected over the time period 1983-1988; however, the data collected from each survey respondent represents waste produced during one year of operation (i.e., annual data). The survey data were placed in a computer file and made available to us for analysis.

Results and Discussion

Table 1 shows the methods used to manage SQG hazardous waste in Florida. Fourteen specific waste-management methods were grouped into seven general waste-management categories. The management method most commonly used was "Recycling" which processed approximately 42,000 metric tons annually or 36 percent of the total SQG hazardous waste produced. The second management method most commonly used was "Sent to Sanitary Landfills" which accounted for approximately 27,000 metric tons annually or 22 percent of the total SQG hazardous waste produced. The third management method most commonly used was "Other

Table 1. Waste-Management methods Used for SQG Hazardous Waste in Florida

Waste Management Category	Annual Amount of Waste (metric tons)	Percent of Category	Percent of Total
(1) Recycling			
Sub-total:	41,562.3	100.0	35.5
(2) Sent to Sanitary Landfills			
Taken by Hauler	25,705.1	96.0	
Taken by Generator	<u>1,069.6</u>	<u>4.0</u>	
Sub-total:	26,774.7	100.0	22.9
(3) Other Methods			
Sub-total:	16,815.3	100.0	14.4
(4) Treatment			
Filtration	4,348.7	40.1	
Neutralization	3,842.5	35.5	
Incineration	1,131.9	10.4	
Burned or Blended for Fuel	<u>1,515.2</u>	<u>14.0</u>	
Sub-total:	10,838.3	100.0	9.3
(5) Discharged to Public Sewers			
Sub-total:	10,403.5	100.0	8.9
(6) Disposed on Property			
Buried on Property	2,338.7	40.5	
Discharged to Septic Tanks	1,837.2	31.8	
Disposed in Pit, Pond, or Lagoon	1,266.8	21.9	
Injected into Wells	<u>331.0</u>	<u>5.7</u>	
Sub-total:	5,773.7	100.0	4.9
(7) Sent to Permitted Facilities*			
Sub-total:	4,874.9	100.0	4.2
Total:	117,042.7		10.0

*Off-site commercial facilities permitted to handle hazardous waste under the RCRA.

Methods" which accounted for approximately 17,000 metric tons annually or 15 percent of the total SQG hazardous waste produced. "Other Methods" was an option included on the survey form; however, the survey respondents were not asked to identify what specific management practices were actually employed when the "Other Methods" category was used.

Approximately 11,000 metric tons or 9 percent of the total SQG hazardous waste produced annually was managed by "Treatment" (Table 1). Approximately 10,000 metric tons or 9 percent of the total SQG hazardous waste produced annually, was "Discharged to Public Sewers." In addition, approximately 6,000 metric tons or 5 percent of the total SQG hazardous waste generated annually was "Disposed on Property" of the SQHWGs. Off-site commercial facilities permitted to manage hazardous waste under the RCRA received approximately 5,000 metric tons or 4 percent of the SQG hazardous waste generated annually.

"Recycling," "Treatment," and "Sent to Permitted Facilities" represent SQG hazardous-waste-management methods that minimize the potential to adversely impact human health and the environment. "Sent to Sanitary Landfills," "Other Methods," "Discharged to Public Sewers," and "Disposed on Property" represent SQG hazardous-waste-management methods that have a greater potential to adversely impact human health and the environment. Therefore, from Table 1, it can be seen that approximately 49 percent or 57,000 metric tons of the SQG hazardous waste

produced annually is managed in an acceptable manner while 51 percent or 60,000 metric tons is managed in a less acceptable manner.

Table 2 shows the types and annual amounts of SQG hazardous waste produced in Florida and the waste-management methods used to manage these wastes. The waste type "Other" includes hazardous waste not reported as one of the other 25 types included on the survey form. Survey respondents were not asked to identify the specific types of hazardous waste that were actually generated when the "Other" waste type was indicated.

The largest quantity of SQG hazardous waste produced was "Waste Oils, Lubricants" which accounted for 35 percent or 41,000 metric tons of the SQG hazardous waste produced annually. "Lead-Acid Batteries" accounted for 14 percent or 17,000 metric tons of the SQG hazardous waste produced annually. "Spent Solvents" accounted for 10 percent or 12,000 metric tons of the SQG hazardous waste produced annually. Significant amounts of "Acidic or Alkaline Wastes," "Rinses with Heavy Metals," "Sludges with Heavy Metals," "Photographic Wastes", "Other", "Spent Plating Wastes," "Dust with Heavy Metals," "Ignitable Paint Waste," and "Ignitable Wastes" were produced. Lesser amounts of "Waste Ammonia," "Washing Solutions," "Empty Pesticide Containers," "Other Pesticide Solutions," "Paint Waste with Heavy Metals," "Waste Ink," "Cyanide Wastes," "Solvent Still Bottoms," "Waste Pesticides," "Waste Formaldehyde," "Dry Cleaning

Filters," "Wood Preservatives," "Waste Explosives," and "Spent Solutions from Dipping" were produced.

Data is presented in the report on the quantities of SQG hazardous waste produced by industry (SIC code) and the seven waste-management categories shown in Table 1.

Conclusions

A significant amount of hazardous waste is produced by SQHWGs in Florida. Approximately half of this waste is managed by methods (recycling, treatment, and disposal in permitted hazardous-waste-management facilities) that minimize the potential to adversely impact human health and the environment. Of particular concern is the large quantity of SQG hazardous waste disposed of in sanitary landfills and discharged to public sewers, since these facilities are not typically designed to handle hazardous waste.

The waste types, that represent the greatest quantities of hazardous waste produced by SQHWGs in Florida, are waste oils and lubricants, lead-acid batteries, spent solvents, and acidic or alkaline wastes. Even though waste oils are not presently regulated as a hazardous waste under the RCRA, they were included in these data because of the potential adverse impacts of these wastes on human health and the environment.

There are potential environmental and human-health problems associated with the management of SQG hazardous waste in Florida as well as throughout the U.S.A.

Table 2. Types and Annual Amounts (Metric tons) of SQG Hazardous Waste Produced in Florida by Waste-Management Category

Waste Type	Waste Management Category															
	Total Waste		Recycling		Sanitary Landfills		Other		Treatment		Public Sewers		Disposed on Property		Permitted Facilities	
	Amount	%*	Amount	%**	Amount	%**	Amount	%**	Amount	%**	Amount	%**	Amount	%**	Amount	%**
Waste Oils,																
Lubricants	41,329.8	35.3	21,021.9	50.7	12,108.0	45.2	3,717.8	22.1	3,192.5	29.5	60.7	<0.1	719.6	12.5	516.0	10.6
Lead-Acid Batteries	16,674.6	14.2	10,245.1	24.6	3,100.7	11.6	1,918.5	11.4	1,328.4	12.3	3.8	<0.1	30.7	<1.0	50.5	1.0
Spent Solvents	12,129.5	10.4	4,516.7	10.9	3,001.8	11.2	1,510.42	9.0	1,410.4	13.0	339.8	3.3	427.8	7.4	923.8	19.0
Acidic or Alkaline Wastes	9,963.1	8.5	1,761.5	4.2	985.4	3.7	254.6	13.4	1,949.6	18.0	2,030.3	19.5	904.7	15.7	76.7	1.6
Rinses with Heavy Metals	7,571.1	6.5	688.0	1.7	922.5	3.5	1,665.7	9.9	1,048.4	9.7	2,792.9	26.8	374.6	6.5	79.0	1.6
Sludges with Heavy Metals	5,979.1	5.1	254.9	<1.0	1,318.8	4.9	1,364.0	8.1	14.1	<1.0	500.4	4.8	1,582.9	27.4	944.2	19.4
Photographic Wastes	5,514.9	4.7	442.8	1.1	252.7	1.0	340.0	2.0	82.2	<1.0	3,902.1	37.5	487.9	8.5	6.7	<1.0
Other Spent Plating Wastes	3,224.4	2.7	484.5	1.2	1,572.3	5.9	304.2	1.8	504.5	4.7	163.8	1.6	122.1	2.1	72.7	1.5
Dust with Heavy Metals	2,313.0	2.0	40.8	<1.0	49.9	<1.0	927.8	5.5	473.7	4.4	165.9	1.6	111.4	1.9	542.8	11.1
Ignitable Paint Waste	2,287.5	1.9	752.4	1.8	996.5	3.7	462.8	2.8	1.1	<1.0	28.5	<1.0	29.0	<1.0	17.1	<1.0
Ignitable Wastes	2,117.8	1.8	474.6	1.1	505.6	1.9	213.9	1.3	115.4	1.1	4.3	<1.0	41.0	<1.0	762.8	15.6
Waste Ammonia	1,492.8	1.3	41.7	<1.0	654.9	2.5	504.8	3.0	101.8	<1.0	9.4	<1.0	12.6	<1.0	166.8	3.4
Washing Solutions	866.7	<1.0	10.9	<1.0	4.8	<1.0	115.0	<1.0	377.1	3.5	20.6	<1.0	1.7	<1.0	336.4	6.9
Empty Pesticide Containers	855.6	<1.0	183.3	<1.0	74.0	<1.0	147.3	<1.0	45.3	<1.0	121.4	1.2	282.4	4.9	1.2	<1.0
Other Pesticide Solutions	743.8	<1.0	177.8	<1.0	290.2	1.1	189.0	1.1	13.9	<1.0	<0.1	<0.1	52.8	<1.0	19.5	<1.0
Paint Waste with Heavy Metals	627.2	<1.0	61.7	<1.0	25.0	<1.0	66.3	<1.0	1.0	<1.0	11.0	<1.0	461.6	8.0	<0.1	<0.1
Waste Ink	627.2	<1.0	142.4	<1.0	319.9	1.2	108.9	<1.0	6.9	<1.0	10.8	<1.0	9.7	<1.0	27.4	<1.0
Cyanide Wastes	617.0	<1.0	110.7	<1.0	125.0	<1.0	145.8	<1.0	69.6	<1.0	91.3	<1.0	2.6	<1.0	71.6	1.5
Solvent Still Bottoms	604.2	<1.0	37.2	<1.0	25.6	<1.0	505.5	3.0	1.6	<1.0	29.0	<1.0	0.2	<1.0	4.3	<1.0
Waste Pesticides	594.9	<1.0	68.0	<1.0	165.4	<1.0	68.5	<1.0	17.6	<1.0	12.7	<1.0	27.4	<1.0	234.6	4.8
Waste	329.8	<1.0	1.8	<1.0	40.5	<1.0	197.1	1.2	41.6	<1.0	7.2	<1.0	35.3	<1.0	6.1	<1.0
Formaldehyde	197.8	<1.0	<0.1	<0.1	19.5	<1.0	21.9	<1.0	5.8	<1.0	94.0	<1.0	51.8	<1.0	4.3	<1.0
Dry Cleaning Filters	182.8	<1.0	6.4	<1.0	104.3	<1.0	32.9	<1.0	32.2	<1.0	0.6	<1.0	<0.1	<0.1	5.8	<1.0
Wood Preservatives	133.0	<1.0	16.3	<1.0	102.9	<1.0	2.2	<1.0	0.6	<1.0	2.6	<1.0	3.1	<1.0	4.6	<1.0
Waste Explosives	55.7	<1.0	20.9	<1.0	9.1	<1.0	21.7	<1.0	3.0	<1.0	0.4	<1.0	<0.1	<0.1	<0.1	<0.1
Spend Solutions from Dipping	10.4	<1.0	<0.1	<0.1	0.2	<1.0	8.7	<1.0	<0.1	<0.1	<0.1	<0.1	0.8	<1.0	<0.1	<0.1
Total:	117,042.7	100	41,562.3	100	26,774.7	100	16,815.3	100	10,838.3	100	10,403.5	100	5,773.7	100	4,874.9	100

*Percent of total SQG hazardous-waste.

**Percent of SQG hazardous waste within waste-management category

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The complete report, entitled "Production and Management of Small-quantity-Generator Hazardous-Waste in Florida," (Order No. PB 89-129 092/AS; Cost: \$13.95, subject to change) will be available only from:

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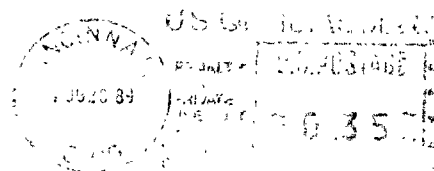
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