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Project Summary

Florida Hazardous Waste and Sanitary Landfill Report

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The purpose of this report is to provide data to the U.S. EPA on the use of sanitary landfills (Subtitle D facilities) for hazardous waste disposal in Florida by small quantity generators. The report contains data on all of the 67 counties in the State of Florida. The report consists of eleven parts including a part called Study Area Data which contains the data aggregated across the counties covered in the report, and ten parts containing data at the individual county level for these 67 counties. Each county is described in terms of location, economic profile, and demographic characteristics. In addition, information is provided on permitted sanitary landfills that are currently active in Florida. Counties in Florida vary considerably in terms of geographic size and location, population level and growth, economic profile, hydrogeological conditions, and waste management facilities. As a result, the data may be quite different from one county to the next. This report contains survey data from approximately 19,000 hazardous waste generators that reside in 514 industries identified by four-digit Standard Industrial Classification codes. The waste generation data are from small quantity generators as defined in 40 CFR Part 260.10. The hazardous waste data are cross-tabulated and displayed in the following seven configurations: types of waste generated (26 types); management methods used (14 methods); types of wastes disposed in sanitary landfills; SIC generating waste; types of waste generated by SIC; management methods used by SIC; and waste types by SIC by management method. The last cross-tabulation consists of 14 sub cross-tabulations. i.e., one for each management method. There are identical sets of cross-tabulations for the aggregated data and for each of the individual county data (i.e., each county has a set of 7 cross-tabulated tables).

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 11 volumes (see Project Report ordering information at back).

Introduction

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) require the U.S. Environmental Protection Agency (EPA) to complete a study of the Subtitle D programs in the states and to submit a report to Congress within 36 months of enactment of the HSWA. This report is to evaluate Subtitle D criteria regarding protection of public health and the environment from ground-water contamination. It will include a detailed assessment of the ground-water monitoring programs at Subtitle D facilities and a recommendation to Congress concerning the enforcement authorities needed to implement the program.

After completion of the report to Congress, the EPA is to revise, where necessary, the criteria for facilities that receive household and small quantity generator hazardous waste. These revisions to the Subtitle D criteria are to include all steps necessary to protect human health and the environment. The amendments specify that, at a minimum,

the revisions should require ground-water monitoring (to detect contamination) at these facilities. Data on the types and quantities of hazardous waste that typically enter Subtitle D facilities are important in order to design monitoring systems to detect contamination. The 1984 RCRA amendments also require the States to adopt and to implement permitting programs that are to be approved by the EPA or that are equivalent or similar to the federal program as defined by current or revised criteria.

An important component in assessing ground-water monitoring programs at Subtitle D facilities involves the acquisition of data on the composition of wastes managed at these facilities. The purpose of this study is to provide the EPA with data on potentially hazardous waste generated and managed by small quantity generators in Florida, as well as with information on sanitary landfills in Florida that are accepting these wastes. The data contained in this report were acquired from approximately 19,000 firms and agencies located in the State of Florida. The methodology used to survey these firms and agencies was developed to allow respondents to identify RCRA-regulated hazardous wastes that they generate. The data contained in this report reflect the wastes produced and managed by small quantity hazardous waste generators as defined in 40 CFR Part 260.10 The sanitary landfills described in the study are those that reside in the State of Florida and that are used for disposal of these wastes.

The study contains data on 514 classifications (i.e., industries) of small quantity generators. including firms engaged in agriculture, forestry, construction, manufacturing, transportation and utilities, wholesale trade, retail trade, services, and educational services. Generator industries are defined by the SIC codes. These data link the types and quantities of potentially hazardous waste that are produced and managed to those industries generating the waste.

The report consists of eleven parts: one part called Study Area Data contains the data aggregated across all of the 67 counties in the State of Florida; the individual county level data are presented in the other ten parts, called County Data. The hazardous waste tables included in the report are the following:

- Types and Amounts of Hazardous Waste Generated Annually;
- Hazardous Waste Management Practices;
- Hazardous Waste Disposed in Sanitary Landfills Annually;
- Hazardous Waste Generated by SIC Code;
- Hazardous Waste Types Generated by SIC Code;
- Hazardous Waste Management Methods Used by SIC Code; and
- Hazardous Waste Types Generated by SIC Code by Management Method.

The waste generation and management data consist primarily of responses from small quantity hazardous waste generators. However, some of the county data are not separated by large quantity generator data and by small quantity generator data. Overall, the portion of large quantity generator waste in these data is not significant.

In addition, the report contains information, obtained from the facility permits, on sanitary landfills that are receiving potentially hazardous wastes. This information is summarized and displayed in tabular form and is constructed from a list of twenty-one characteristics, as follows:

- Class of Landfill
- Responsible Authority
- Design Capacity
- Population Served
- Disposal Method
- Waste Types Accepted
- Land Owner
- Disposal Acreage
- Waste per Day Accepted
- Total Acreage
- Landfill Type
- Years in Operation
- Gas Control Used
- Cell Depth
- Depth to the Water Table
- Soil Permeability
- Liner Material
- Number of Monitoring Wells
- Approved GW Monitoring Plan
- Adjacent Land Use
- Number of Surface Monitoring Points

The part of this report entitled Study Area Data contains information concerning the number of sanitary landfills in each county, the classes of sanitary landfills in each county, and average values for selected landfill characteristics. The data presented in this report are only for sanitary landfills that are in use (i.e., permit status: active).

Methodology

The data in the report were collected at the county level under a statewide hazardous waste assessment program. The data are presented in tabular form by amount, waste type, management method, and SIC code. Some deficiencies exist in the data, and are made explicit in the text of the report; however, they do not significantly affect the conclusions contained in the report.

Waste amounts are in units of pounds for the County Data (Parts I - X) and in units of short tons for the aggregated Study Area Data (Part XI). There are 26 waste types, 14 waste management methods, and 514 four-digit Standard Industrial Classifications used in the report.

In each of the parts entitled County Data, there is one table for each active sanitary landfill in each county. These tables contain information which has been extracted from the facility permits on the 21 characteristics for each sanitary landfill.

The study area shown in Figure 1 consists of all of the 67 counties in the State of Florida. Florida counties consist of various combinations of highly populated areas, urban areas, rural areas, coastal and non-coastal areas, industrialized areas with varied manufacturing activities, and areas that are relatively non-industrialized. In the County Data each county is described in terms of location, population, and economic activities occurring within the county The waste-related data and characteristics of sanitary landfills in the study area provide a comprehensive representation of small quantity hazardous waste generation and management in the State of Florida Florida has a large concentration of these smaller hazardous waste generators relative to many other states. This is due, in part, to the overall economic profile of Florida and to its relatively high growth rate In terms of assessing, nationwide the implications of hazardous waste disposal in sanitary landfills by small quantity generators, these data are particularly useful.

Results

The hazardous waste generator data for all of the 67 counties in the study area (in the State of Florida) have been aggregated and displayed in seven tables in the report. These tables provide information on the hazardous waste generation and management practices of smaller hazardous waste generators in the State of Florida, particularly as these practices relate to the use of sanitary landfills for disposal of these wastes

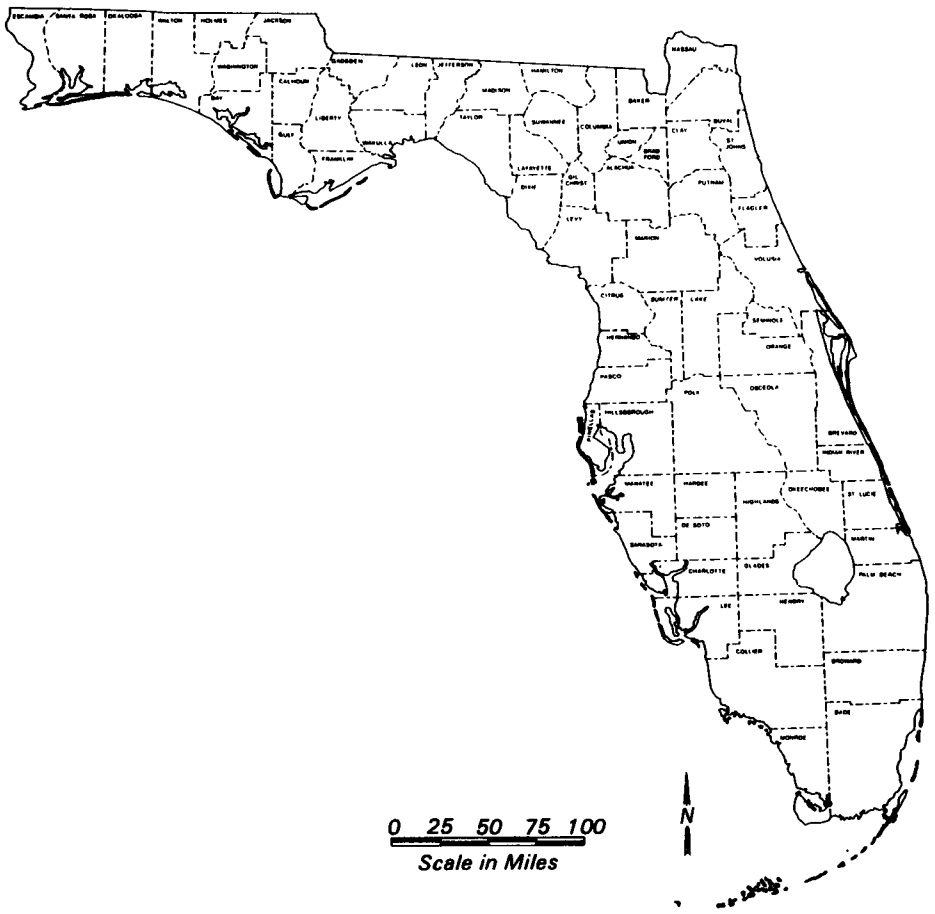

Figure 1. *Project study area.*

Although waste oils are not currently regulated as a hazardous waste under the RCRA, they are included in the data.

The following tables contain data aggregated across all of the 67 counties in the study area. Table 1 shows the types and amounts of hazardous waste generated annually in the study area by small quantity generators, using the 26 categories reported by survey respondents. The total amount of small quantity generator waste reported is 129,015 tons. In terms of weight, the major types of waste generated are "Waste Oils, Lubricants," "Lead-Acid Batteries," "Spent Solvents," "Acidic or Alkaline Wastes," "Rinses with Heavy Metals," "Sludges with Heavy Metals," "Photographic Wastes," "Other," "Spent Plating Wastes," and "Dust with Heavy Metals."

Table 2 shows the practices reported used to manage these wastes and how these various management practices were used to manage the total amount of waste (129,015 tons) generated annually. The primary waste management practices that are reported to be used are '"Recycled," "City, Cty., Pvt. Hauler to Landfill" (i.e., a sanitary landfill regulated under Subtitle D of the RCRA), "Other Methods," "Discharged to a Public Sewer," "Sent to a Subtitle C Facility," "Treated by Filtration," and "Treated by Neutralization." The categories "City, Cty., Pvt. Hauler to Landfill" (28,335 tons) and "Generator Takes Waste to Landfill" (1,179 tons) relate to disposal in a sanitary landfill permitted under Subtitle D of the RCRA. The sum of these two categories (29,514 tons) is the total amount of waste reported sent to a sanitary landfill in the study area. The category "Sent to a Subtitle C Facility" describes wastes managed at facilities permitted by the EPA (or a state) to accept hazardous waste. The category "Incinerated" refers to non-hazardous waste incineration, and the category "Other Methods" includes any method not otherwise specified.

Table 3 shows the total amount of hazardous waste disposed of annually in the 160 sanitary landfills in the study area (29,514 tons). The major types of waste disposed of in sanitary landfills, by

Table 1. *Study Area Data: Types and Amounts of Hazardous Waste Generated Annually*

Waste Type	Waste Amount*	% of Total
Waste Pesticides	364	0.28
Washing Solutions	943	0.73
Empty Pesticide Containers	820	0.64
Spent Solutions from Dipping	11	0.01
Other Pesticide Solutions	691	0.53
Dust with Heavy Metals	2,522	1.95
Rinses with Heavy Metals	8,346	6.47
Sludges with Heavy Metals	6,591	5.11
Waste Ink	680	0.53
Ignitable Paint Waste	2,334	1.81
Paint Waste with Heavy Metals	690	0.54
Spent Solvents	13,370	10.36
Solvent Still Bottoms	656	0.51
Dry Cleaning Filters	201	0.16
Cyanide Wastes	666	0.52
Acidic or Alkaline Wastes	10,982	8.51
Spent Plating Wastes	2,550	1.98
Waste Ammonia	955	0.74
Photographic Wastes	6,079	4.71
Ignitable Wastes	1,646	1.27
Wood Preservatives	147	0.11
Waste Formaldehyde	218	0.17
Lead-Acid Batteries	18,380	14.25
Waste Explosives	61	0.05
Waste Oils, Lubricants	45,558	35.31
Other	3,554	2.75
TOTAL	**129,015**	**100**

* *Short Tons*

weight, are "Waste Oils, Lubricants," "Lead-Acid Batteries," "Spent Solvents," "Other," "Sludges with Heavy Metals," "Dust with Heavy Metals," "Acidic or Alkaline Wastes," "Rinses with Heavy Metals," and "Ignitable Wastes."

The remaining five tables from the Study Area Data are not included in this project summary. These five tables show, in units of short tons, the amounts of hazardous waste generated by SIC code; the characteristics of sanitary landfills in the State of Florida; and, for each SIC code, the types of waste generated; and management methods used. The tables in the report that show data sorted by SIC codes contain a four-digit numerical code as well as a description of the classification.

On the average, each of the 160 sanitary landfills in the study area serves a population of approximately 100,000 people; is between 80 - 120 acres in size; has a cell depth of 12 feet; has a water table depth of 20 feet; has a soil permeability of 18 inches per hour; has 6 ground-water monitoring wells and 2 surface water points; and has adjacent land that is agricultural.

Conclusion

These data have been compiled to assist the U.S. EPA in evaluating facilities regulated under Subtitle D of the RCRA and, specifically, in evaluating sanitary landfills so that appropriate ground-water monitoring systems can be established at these facilities. The data contained in this report will further assist the U.S. EPA in defining the problems associated with hazardous waste disposal in sanitary landfills and other management methods used by small quantity generators of hazardous waste. In addition, these data can provide information that the agency can use to evaluate waste oil in the context of regulatory concerns.

Table 2. *Study Area Data: Hazardous Waste Management Practices*

Management Practice	Waste Amount*	% of Total
City, Cty., Pvt. Hauler to Landfill	28,335	21.96
Generator Takes Waste to Landfill	1,179	0.91
Generator Buries Waste on Property	2,578	2.00
Disposed in Pit, Pond, or Lagoon	1,396	1.08
Sent to a Subtitle C Facility	5,373	4.16
Discharged to a Public Sewer	11,468	8.89
Discharged to a Septic Tank	2,025	1.57
Recycled	45,814	35.51
Burned or Blended for Fuel	1,670	1.30
Incinerated	1,248	0.97
Injected into a Well	365	0.28
Treated by Filtration	4,793	3.72
Treated by Neutralization	4,236	3.28
Other Methods	18,535	14.37
TOTAL	**129,015**	**100**

* Short Tons

Table 3. *Study Area Data: Hazardous Waste Disposed in Sanitary Landfills Annually*

Waste Type	Waste Amount*	% of Total
Waste Pesticides	45	0.15
Washing Solutions	82	0.28
Empty Pesticide Containers	320	1.08
Spent Solutions from Dipping	0	0.00
Other Pesticide Solutions	28	0.09
Dust with Heavy Metals	1,098	3.72
Rinses with Heavy Metals	1,017	3.45
Sludges with Heavy Metals	1,453	4.92
Waste Ink	138	0.47
Ignitable Paint Waste	557	1.89
Paint Waste with Heavy Metals	353	1.20
Spent Solvents	3,309	11.21
Solvent Still Bottoms	182	0.62
Dry Cleaning Filters	115	0.39
Cyanide Wastes	28	0.10
Acidic or Alkaline Wastes	1,086	3.68
Spent Plating Wastes	55	0.19
Waste Ammonia	5	0.02
Photographic Wastes	279	0.94
Ignitable Wastes	722	2.45
Wood Preservatives	113	0.38
Waste Formaldehyde	21	0.07
Lead-Acid Batteries	3,418	11.58
Waste Explosives	10	0.03
Waste Oils, Lubricants	13,347	45.22
Other	1,733	5.87
TOTAL	**29,514**	**100**

* Short Tons

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***Victor W. Lambou** is the EPA Project Officer (see below).*
The complete report consists of eleven volumes entitled "Florida Hazardous Waste and Sanitary Landfill Report," (Set Order No. PB 88-211 164/AS; Cost: $528.50, subject to change). Parts I through X of this set are entitled "Florida Hazardous Waste and Sanitary Landfill Report, County Data–Generator Data and Characteristics of Sanitary Landfills." Part XI is entitled "Florida Hazardous Waste and Sanitary Landfill Report, Study Area Data–Generator Data and Characteristics of Sanitary Landfills." Order numbers and costs for the 11 parts of this report are:

Part I	*PB 88-211 172/AS*	*$ 38.95*
Part II	*PB 88-211 180/AS*	*$ 50.95*
Part III	*PB 88-211 198/AS*	*$ 56.95*
Part IV	*PB 88-211 206/AS*	*$ 50.95*
Part V	*PB 88-211 214/AS*	*$ 44.95*
Part VI	*PB 88-211 222/AS*	*$ 56.95*
Part VII	*PB 88-211 230/AS*	*$ 50.95*
Part VIII	*PB 88-211 248/AS*	*$ 56.95*
Part IX	*PB 88-211 255/AS*	*$ 62.95*
Part X	*PB 88-211 263/AS*	*$ 38.95*
Part XI	*PB 88-211 271/AS*	*$110.95*

All costs are subject to change. All reports will be available only from:
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