



## Project Summary

# Hazardous Waste in Selected Florida Counties

Roy C. Herndon and John E. Moerlins

The purpose of this report is to provide data to the USEPA on the use of sanitary landfills (Subtitle D facilities) for hazardous waste disposal in Florida by small quantity generators. This report was completed in two stages. Each stage of the project resulted in a three volume interim report. The first interim report contains data on 21 counties, and the second interim report contains data on 22 additional counties. The first interim report consists of a volume called Study Area Data which contains the data aggregated across the 21 counties covered in the first interim report, and two volumes containing data at the individual county level for these 21 counties. The second interim report also includes a volume called Study Area Data, but in this volume, the data are aggregated across all 43 counties, including the 21 counties covered in the first interim report. The other two volumes of the second interim report contain data at the individual county level for those 22 additional counties. Each county is described in terms of location, economic profile, and demographic characteristics. In addition, information is provided on all permitted sanitary landfills that are currently active in the county. Counties in Florida vary considerably in terms of geographic size and location, population level and growth, economic profile, geology, and waste management facilities. As a result, the data may be quite different from one county to the next. There are 67 counties in Florida, and the 43

included in this report represent more than 90 percent of total state population and manufacturing activity. This report contains survey data from approximately 12,000 hazardous waste generators that reside in 488 industries as defined by 4-digit Standard Industrial Classification (SIC) codes. The waste generation data are from small quantity generators as defined by 40 CFR Part 260.10. The hazardous waste data are cross tabulated and displayed in the following 7 configurations: types of wastes generated (26 types); management methods used (14 methods); types of wastes disposed in sanitary landfills; SIC generating waste; types of wastes 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 six separate volumes of the same title (see Project Report ordering information at back).*

## Introduction

The 1984 Hazardous and Solid Waste Amendments to RCRA require the U.S. Environmental Protection Agency (EPA) to complete a study of the current Subtitle D programs in the States and to report to Congress within 36 months of enactment. The study is to evaluate the current criteria regarding protection of public health and the environment from problems associated with groundwater contamination. The study is to include a detailed assessment of the groundwater monitoring programs at Subtitle D facilities as well as a recommendation to Congress concerning what enforcement authorities are needed to properly implement the program.

After completion of the study prepared for Congress, the EPA is to revise, where necessary, the criteria for facilities that receive household and small quantity generator hazardous waste. The revisions are to include all steps necessary to protect human health and the environment. The amendments specify that, at a minimum, the revisions should require the groundwater monitoring necessary to detect contamination. Information on the types and quantities of hazardous waste that typically enter Subtitle D facilities is important in order to properly design monitoring systems to detect contamination. The 1984 RCRA amendments 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 groundwater 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. The data contained in this report were acquired from approximately 12,000 firms and agencies in Florida. The survey of these firms was constructed 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 counties that have provided

the hazardous waste generation and management data.

The study also contains data on 488 classifications (i.e., industries) of small quantity generators that are disposing of potentially hazardous wastes in sanitary landfills in Florida, 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 four-digit SIC codes. The study data link the types and quantities of potentially hazardous waste that is produced and managed to those industries generating the wastes.

The second interim report (May 1986) consists of two parts: Study Area Data and County Data. The individual County Data is presented in two volumes. The Study Area Data volume consists of a set of tables for all data aggregated across the 43 counties included in the two interim reports. The hazardous waste tables included in the report are the following:

- Types and Amounts of Hazardous Waste Generated
- Hazardous Waste Management Methods Used
- Hazardous Waste Disposed in Sanitary Landfills
- Hazardous Waste Generated by Standard Industrial Classification
- Hazardous Waste Types Generated by Standard Industrial Classification
- Hazardous Waste Management Methods Used by Standard Industrial Classification
- Hazardous Waste Types by Standard Industrial Classification by Waste 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 on sanitary landfills that are receiving potentially hazardous wastes. Information on these sanitary landfills were obtained from the facility permits. The sanitary landfill information is summarized and displayed in tabular form and is constructed from a list of 21

characteristics. These sanitary landfill characteristics are the following:

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

The volume 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 of selected landfill characteristics. The data presented in this report are only for sanitary landfills that are currently in use (i.e., permit status: active).

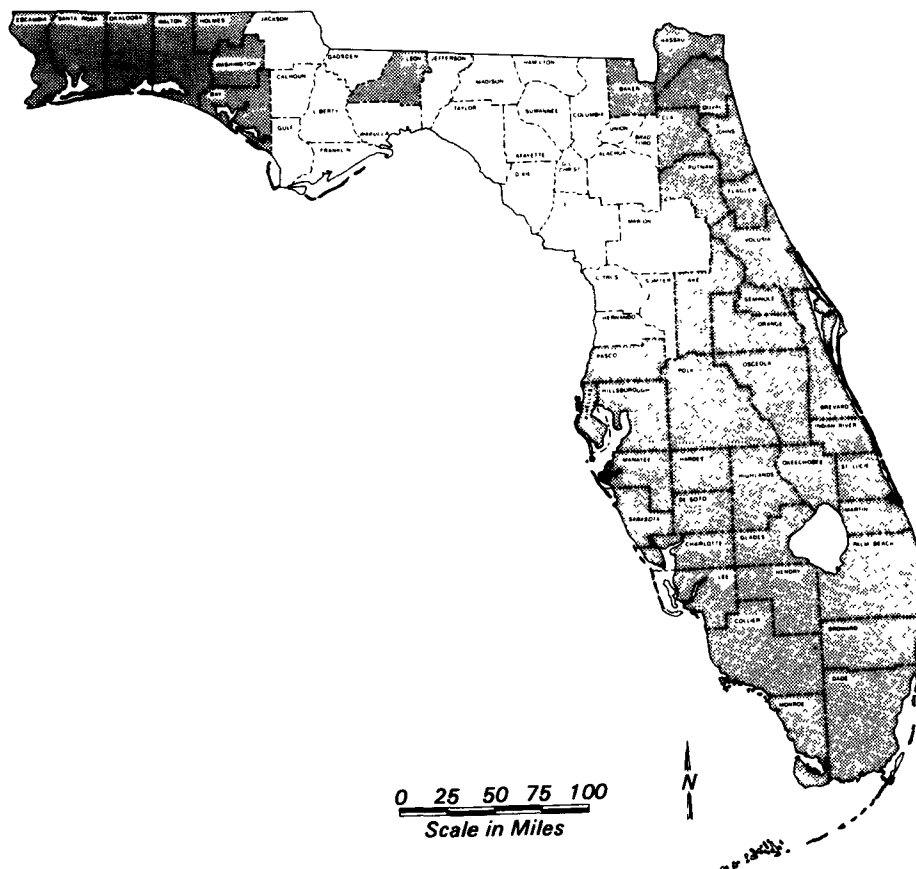
## Methodology

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, type, waste, management method, and Standard Industrial Classification (SIC). Some deficiencies exist in the data and these deficiencies are made explicit in the text of the report. These deficiencies, however, do not significantly affect the conclusions contained in the report.

Waste amounts are in units of pounds for the county data and in units of tons for the study area aggregated data. There are 26 waste types, 14 waste management methods, and 488 four-digit SICs used in the report.

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

The study area shown in Figure 1 consists of 43 of the 67 counties in Florida. The counties included in the study area are the following:



**Figure 1.** Project study area. (Counties included in the project study area are shaded.)

Baker	Highlands	Palm Beach
Bay	Hillsborough	Pasco
Brevard	Holmes	Pinellas
Broward	Indian River	Polk
Charlotte	Lake	Putnam
Clay	Lee	St. Johns
Collier	Leon	St. Lucie
Dade	Manatee	Santa Rosa
De Soto	Martin	Sarasota
Duval	Monroe	Seminole
Escambia	Nassau	Volusia
Flagler	Okaloosa	Walton
Glades	Okeechobee	Washington
Hardee	Orange	
Hendry	Osceola	

These counties are diverse in terms of population, location, and economic profile. These counties consist 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 volumes entitled County Data, each county in the study area is described in terms of location, population, and eco-

conomic activities occurring in the county.

Overall, the 43 counties in the study area contain 93 percent of the population of Florida and 94 percent of the manufacturing activities of Florida as measured by value added in manufacturing. 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 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 hazardous waste disposal in sanitary landfills by small quantity generators, these data are particularly useful.

### Results

The hazardous waste generator data for counties in the study area 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 Florida, particularly as they relate to the use of sanitary landfills for disposal of these wastes. Although not currently regulated as a hazardous waste under RCRA, waste oils have been included in the data.

The following tables contain aggregated survey data for all 43 counties in its study area. Table 1 shows the types and amounts of hazardous waste reported generated in the study area. The total amount of small quantity generator waste reported generated was 118,896 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," "Photographic Wastes," "Sludges with Heavy Metals," "Other," and "Dust with Heavy Metals."

Table 2 shows the practices reported to have been used to manage these wastes and shows how the various waste management practices were applied to the total amount of waste (118,896 tons). The primary waste management practices that are reported to be used are "Recycled," "City, Cty., Pvt. Hauler to Landfill" (sanitary landfill regulated under Subtitle D of the RCRA), "Other Methods," "Discharged to a Public Sewer," "Treated by Filtration," "Treated by Neutralization," and "Sent to a Subtitle C Facility." The categories "City, Cty., Pvt. Hauler to Landfill" (27,928 tons) and "Generator Takes Waste to Landfill" (1,139 tons) relate to disposal in a sanitary landfill permitted under Subtitle D of the RCRA. The total amount of waste reported sent to a sanitary landfill in the study area is 29,067 tons. The category "Sent to a Subtitle C Facility" relates to wastes managed at facilities permitted by the EPA (or a state) to accept hazardous waste. (Most of the hazardous waste in Florida that is commercially disposed or is treated at a Subtitle C facility is sent out of state.) The category "Incinerated" relates to the use of a non-hazardous waste incinerator (e.g., a hospital incinerator). The category "Other Methods" includes any method not otherwise specified.

Table 3 shows the total amount of hazardous waste disposed of annually in the 123 sanitary landfills in the study area (29,067 tons). In terms of weight,

the major types of waste disposed of in sanitary landfills 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 four summary tables from the May 1986 interim report are not included in the report summary. These remaining tables show in units of tons the amounts of waste generated by SIC; types of waste generated by management method; and, for each management method, the types of waste by SIC. All the tables in the report that show data sorted by SIC, contain the appropriate four-digit numerical code as well as a description of the classification.

On average, each of the 123 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 depth to water table of 20 feet; has a soil permeability of 18 inches per hour; has 6 groundwater monitoring wells and 2 surface water points; and has adjacent land that is agricultural.

### Conclusion

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

**Table 1. Study Area Data, Types and Amounts of Hazardous Waste Generated Annually (in Tons)\***

<i>Waste Type</i>	<i>Waste Amount</i>	<i>Percent of Total</i>
<i>Waste Pesticides</i>	360	0.303
<i>Washing Solutions</i>	862	0.725
<i>Empty Pesticide Containers</i>	814	0.685
<i>Spent Solutions from Dipping</i>	11	0.010
<i>Other Pesticide Solutions</i>	184	0.155
<i>Dust with Heavy Metals</i>	2361	1.987
<i>Rinses with Heavy Metals</i>	8264	6.951
<i>Sludges with Heavy Metals</i>	5768	4.852
<i>Waste Ink</i>	675	0.568
<i>Ignitable Paint Waste</i>	2197	1.848
<i>Paint Wastes with Heavy Metals</i>	680	0.572
<i>Spent Solvents</i>	12674	10.660
<i>Solvent Still Bottoms</i>	578	0.487
<i>Dry Cleaning Filters</i>	188	0.158
<i>Cyanide Wastes</i>	665	0.560
<i>Acidic or Alkaline Wastes</i>	10381	8.732
<i>Spent Plating Wastes</i>	2049	1.724
<i>Waste Ammonia</i>	585	0.493
<i>Photographic Wastes</i>	5902	4.964
<i>Ignitable Wastes</i>	1598	1.345
<i>Wood Preservatives</i>	142	0.120
<i>Waste Formaldehyde</i>	202	0.170
<i>Lead-Acid Batteries</i>	15877	13.355
<i>Waste Explosives</i>	58	0.049
<i>Waste Oils, Lubricants</i>	42259	35.543
<i>Other</i>	3548	2.985
<i>Total</i>	118896	100.000

\*This table contains information on the 43 counties listed in the "Methodology" section of the Project Summary.

**Table 2. Study Area Data, Hazardous Waste Management Practices (in Tons)\***

<i>Management Practice</i>	<i>Waste Amount</i>	<i>Percent of Total</i>
<i>City, Cty., Pvt. Hauler to Landfill</i>	<i>27928</i>	<i>23.489</i>
<i>Generator Takes Waste to Landfill</i>	<i>1139</i>	<i>0.958</i>
<i>Generator Buries Waste on Property</i>	<i>1462</i>	<i>1.230</i>
<i>Disposed in Pit, Pond, or Lagoon</i>	<i>1279</i>	<i>1.076</i>
<i>Sent to a Subtitle C Facility</i>	<i>3998</i>	<i>3.363</i>
<i>Discharged to a Public Sewer</i>	<i>10690</i>	<i>8.991</i>
<i>Discharged to a Septic Tank</i>	<i>2010</i>	<i>1.691</i>
<i>Recycled</i>	<i>40377</i>	<i>33.960</i>
<i>Burned or Blended for Fuel</i>	<i>942</i>	<i>0.792</i>
<i>Incinerated</i>	<i>1241</i>	<i>1.044</i>
<i>Injected into a Well</i>	<i>364</i>	<i>0.306</i>
<i>Treated by Filtration</i>	<i>4789</i>	<i>4.028</i>
<i>Treated by Neutralization</i>	<i>4213</i>	<i>3.543</i>
<i>Other Methods</i>	<i>18459</i>	<i>15.525</i>
<i>Total</i>	<i>118896</i>	<i>100.000</i>

*\*This table contains information on the 43 counties listed in the "Methodology" section of the Project Summary.*

**Table 3. Study Area Data, Hazardous Waste Disposed in Sanitary Landfills Annually (in Tons)\***

<i>Waste Type</i>	<i>Waste Amount</i>	<i>Percent of Total</i>
<i>Waste Pesticides</i>	<i>44</i>	<i>0.153</i>
<i>Washing Solutions</i>	<i>68</i>	<i>0.235</i>
<i>Empty Pesticide Containers</i>	<i>314</i>	<i>1.083</i>
<i>Spent Solutions from Dipping</i>	<i>0</i>	<i>0.000</i>
<i>Other Pesticide Solutions</i>	<i>27</i>	<i>0.095</i>
<i>Dust with Heavy Metals</i>	<i>1094</i>	<i>3.767</i>
<i>Rinses with Heavy Metals</i>	<i>1016</i>	<i>3.498</i>
<i>Sludges with Heavy Metals</i>	<i>1362</i>	<i>4.688</i>
<i>Waste Ink</i>	<i>136</i>	<i>0.469</i>
<i>Ignitable Paint Waste</i>	<i>543</i>	<i>1.869</i>
<i>Paint Wastes with Heavy Metals</i>	<i>347</i>	<i>1.195</i>
<i>Spent Solvents</i>	<i>3281</i>	<i>11.289</i>
<i>Solvent Still Bottoms</i>	<i>159</i>	<i>0.548</i>
<i>Dry Cleaning Filters</i>	<i>111</i>	<i>0.382</i>
<i>Cyanide Wastes</i>	<i>28</i>	<i>0.097</i>
<i>Acidic or Alkaline Wastes</i>	<i>1069</i>	<i>3.679</i>
<i>Spent Plating Wastes</i>	<i>54</i>	<i>0.189</i>
<i>Waste Ammonia</i>	<i>4</i>	<i>0.016</i>
<i>Photographic Wastes</i>	<i>275</i>	<i>0.948</i>
<i>Ignitable Wastes</i>	<i>716</i>	<i>2.466</i>
<i>Wood Preservatives</i>	<i>113</i>	<i>0.389</i>
<i>Waste Formaldehyde</i>	<i>13</i>	<i>0.045</i>
<i>Lead-Acid Batteries</i>	<i>3369</i>	<i>11.594</i>
<i>Waste Explosives</i>	<i>10</i>	<i>0.034</i>
<i>Waste Oils, Lubricants</i>	<i>13173</i>	<i>45.322</i>
<i>Other</i>	<i>1729</i>	<i>5.951</i>
<i>Total</i>	<i>29067</i>	<i>100.000</i>

*\*This table contains information on the 43 counties listed in the "Methodology" section of the Project Summary.*

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P. METER  
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*Roy C. Herndon and John E. Moerlins are with Florida State University, Tallahassee, FL 32306-4016.*

*Victor W. Lambou is the EPA Project Officer (see below).*

*The complete report consists of six volumes, entitled "Hazardous Waste in Selected Florida Counties:"*

*"Generator Data and Characteristics of Sanitary Landfills, First Interim Report," (Order No. PB 87-193 421/AS; Cost: \$54.95)*

*"Generator Data and Characteristics of Sanitary Landfills, First Interim Report, Volume I.," (Order No. PB 87-193 439/AS; Cost: \$60.95)*

*"Generator Data and Characteristics of Sanitary Landfills, First Interim Report, Volume II.," (Order No. PB 87-193 447/AS; Cost: \$72.95)*

*"Generator Data and Characteristics of Sanitary Landfills, Second Interim Report," (Order No. PB 87-193 454/AS; Cost: \$78.95)*

*"Generator Data and Characteristics of Sanitary Landfills, Second Interim Report, Volume I.," (Order No. PB 87-193 462/AS; Cost: \$72.95)*

*"Generator Data and Characteristics of Sanitary Landfills, Second Interim Report, Volume II.," (Order No. PB 87-193 470/AS; Cost: \$84.95)*

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*U.S. Environmental Protection Agency*

*P.O. Box 93478*

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