



Landfill Disposal

and operated. Nine facilities are privately owned and operated and seven facilities are publicly owned and privately operated.

In addition to the Municipal Solid Waste Landfills, the State has 185 active Construction and Demolition (C&D) debris disposal facilities as shown in Table 11. Of these facilities, 98 are permitted as active C & D disposal facilities and 91 are permitted as land clearing facilities. Four of the facilities are permitted as both C&D and land clearing facilities.

Prior to 1996, Florida experienced a steady growth in the number of C&D facilities. Since 1996, there has been a significant drop in the total number of permitted C&D disposal facilities.... partially due to new C&D regulations.

MSW landfills are contained on properties that vary widely in land size from 40 acres to approximately 6,700 acres. However, within these total property areas, the actual active disposal cell areas vary from a few acres to approximately 250 acres. Attempts are made today to construct modern MSW landfills within sufficient buffering land areas to minimize adverse impacts to surrounding land uses and the existing ecosystem. The disposal cells of these landfills receive anywhere from 10 tons per day (TPD) to 2,500 TPD of refuse. The smallest landfill is located in Glades County, receiving less than 17 TPD of waste and having a total land area of 40 acres. Three of the larger MSW landfills in Florida are Trail Ridge Landfill in Duval County, receiving approximately 2,000 TPD of waste, contained within a total site area of 978 acres; Berman Road Landfill in Okeechobee County, receiving approximately 2,800 TPD of waste within a total site area of 2,900 acres; and Orange County Landfill, receiving approximately 2,100 TPD of waste within a total site area of 5,000 acres.

There are four major regional landfill facilities which receive MSW from neighboring counties as

Overview

In 1980, Florida had approximately 500 open dumps. During this time period, it was a common practice to either burn or use one of these open dumps in order to alleviate the solid waste. Not one of these landfills contained any methods to prevent toxins from leaching into the groundwater.

Today, Florida has 100 active Class I and Class III landfills [The landfill classifications are defined on the next page or can be found in the Florida Administrative Code Rule 62-701.340(3)]. Of those facilities, 60 are Class I landfills and 40 are Class III. At this time, Florida does not have any active Class III landfills. All of the active Class I municipal solid waste (MSW) landfills are operating in lined cells.

Of the 60 Class I MSW landfills operating in the State, the majority of the facilities are county owned

Table 11: Active C&D Debris Facilities in Florida

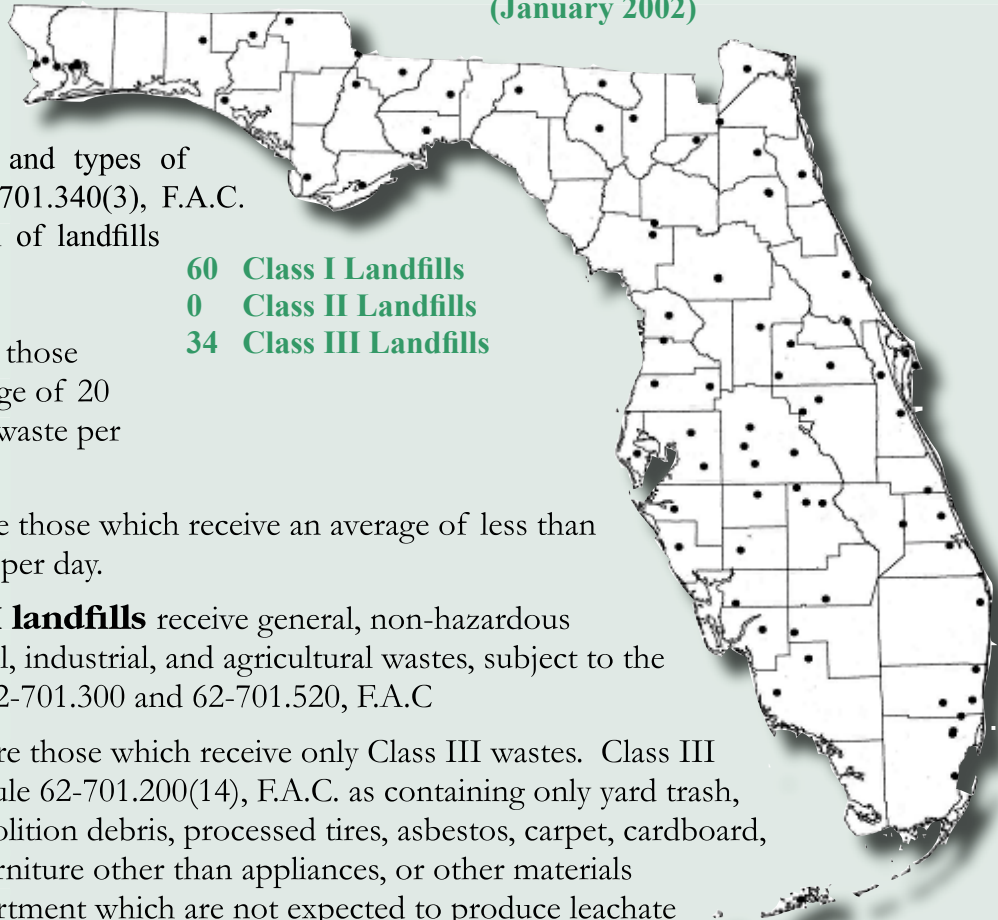
District	C&D Disposal	Land Clearing Debris Disposal	District Totals
Northwest	33	71	104
Northeast	9	11	20
Central	26	7	33
Southwest	20	1	21
Southeast	8	0	8
South	2	1	3
Totals	98	91	189
Total Facilities	185	(Three are both C&D and Land Clearing Facilities)	

Classification of Landfills

Landfills or solid waste disposal units are classified according to the amount and types of waste received. Rule 62-701.340(3), F.A.C. describes the classification of landfills in Florida as following:

- **Class I landfills** are those which receive an average of 20 tons or more of solid waste per day.
- **Class II landfills** are those which receive an average of less than 20 tons of solid waste per day.
- **Class I and Class II landfills** receive general, non-hazardous household, commercial, industrial, and agricultural wastes, subject to the restrictions of Rules 62-701.300 and 62-701.520, F.A.C
- **Class III landfills** are those which receive only Class III wastes. Class III waste are defined in Rule 62-701.200(14), F.A.C. as containing only yard trash, construction and demolition debris, processed tires, asbestos, carpet, cardboard, paper, glass, plastic, furniture other than appliances, or other materials approved by the Department which are not expected to produce leachate which poses a threat to public health or the environment. Class III landfills shall not accept putrescible household waste.

Figure 20: Active Class I, II and III Landfills (January 2002)



well as their own. These facilities are Springhill Regional landfill in Jackson County, Aucilla Area Solid Waste Facility in Madison County, New River Regional landfill in Union County, and Berman Road Landfill in Okeechobee County.

The restrictions placed upon landfill owners because of “federal RCRA Subtitle D” has had little or no effect as to whether the counties in Florida chose regionalization. Typically, solid waste management facility permit applications for new or existing landfills are reviewed by Department personnel in one of the six District offices throughout the State. Compliance inspections are conducted on a quarterly basis for Class I and II landfills, and semiannually for Class III landfills. A list of Department Solid Waste staff is provided in Appendix E.

Class I, II and III landfills normally operate under

five year permits. Ordinarily, processing a Class I construction permit application may take anywhere from one year to 18 months from the time the original application is received by the Department to the time a final permit is issued. The permitting application fee for constructing or operating a Class I landfill is \$10,000.

In addition to the Class I, II and III landfills, the Department authorizes the use of Construction and Demolition Debris facilities, otherwise known as C&D facilities. C&D debris is defined in rule 62-701.200 (27) as:

- Discarded materials generally considered to be not water soluble and non-hazardous in nature, including but not limited to steel, glass, brick, concrete, asphalt material, pipe, gypsum wallboard, and lumber, from the construction or

destruction of a structure as part of a construction or demolition project or from the renovation of a structure, including such debris from construction of structures at a site remote from the construction or demolition project site.

- The term includes rocks, soils, tree remains, trees, and other vegetative matter which normally results from land clearing or land development operations for a construction project; clean cardboard, paper, plastic, wood, and metal scraps from a construction project;
- Effective January 1, 1997, except as provided in Section 403.707(13)(j), F.S., unpainted, non-treated wood scraps from facilities manufacturing materials used for construction of structures or their components and unpainted, non-treated wood pallets provided the wood scraps and pallets are separated from other solid waste where generated and the generator of such wood scraps or pallets implements reasonable practices of the generating industry to minimize the commingling of wood scraps or pallets with other solid waste; and
- De minimis amounts of other nonhazardous wastes that are generated at construction or demolition projects, provided such amounts are consistent with best management practices of the construction and demolition industries.
- Mixing of construction and demolition debris with other types of solid waste will cause it to be classified as other than construction and demolition debris.

Landfill Liner Designs

Florida began requiring landfill liners for Class I and II municipal solid waste landfills in 1985. The original requirements were for either a single clay liner or a single geomembrane liner. The single clay liner had to be at least three feet in thickness with a maximum hydraulic conductivity of 1×10^{-7} cm/sec. The single geomembrane liner had to be either a reinforced geomembrane at least 30-mils thick or an unreinforced geomembrane at least 60-mils thick. The maximum leachate head allowed on top of

either liner was 12 inches.

Today the Department requires either a composite liner or a double liner in the construction of new Class I or II MSW landfill cells. These two options allow for flexibility in the design of the liner system. The composite liner consists of a layer of low permeability clay overlain by a geomembrane with a thickness of at least 60-mils. The required hydraulic conductivity of the clay component of the composite liner depends on the design hydraulic head for the liner system and the thickness of the clay layer. Allowed design hydraulic heads range from 1 to 12 inches. As a result, a total of nine options for the composite liner are allowed with varying thickness and hydraulic conductivity of the clay liner component. The clay component in these options ranges from 12 inches to 36 inches in thickness with a maximum hydraulic conductivity ranging from 1×10^{-7} cm/sec to 1×10^{-8} cm/sec.

The double liner consists of two geomembranes,



Methane gas flare at a landfill

Photo by Bill Hinkley

each having a thickness of at least 60-mils, which are separated by a leak detection layer and then all placed upon a 6-inch thick sub-base having a maximum hydraulic conductivity of 1×10^{-5} cm/sec. The maximum design hydraulic head allowed on top of the double liner is 12 inches. All of the liner systems allowed by the Department are constructed according to detailed Construction Quality Assurance and Quality Control (QA/QC) requirements to ensure the liner components are properly installed.

Since Class III landfills do not receive MSW for disposal, they are not automatically required to be lined. Special requirements for Class III landfills are contained in Rule 62-701.340(3)(c), F.A.C. which states that “[t]he Department shall exempt Class III landfills from some or all of the requirements for liners, leachate controls, and water quality monitoring in Rules 62-701.400 (3) and (4), and 62-701.510, F.A.C., if the applicant demonstrates that no significant threat to the environment will result from the exemption based upon the types of waste received, methods for controlling types of waste disposed of, and the results of the hydrogeological and geotechnical investigations required in Rule 62-701.410, F.A.C.”

As a result of this rule language, each Department District office must decide on a case-by-case basis if a liner will be required for a proposed Class III landfill. In all cases, the Department goal is to protect human health and the environment.

Tipping Fees

According to the state survey conducted as a part of the 1998-1999 Recycling and Education Grant Applications, Class I MSW tipping fees vary from county to county, ranging from \$23.00/ton to \$92/ton. The statewide average tipping fee per ton of MSW for Class I landfills is \$42.47.

Counties which have WTE facilities located within their county boundaries charge an average of \$58.83

per ton of MSW. In general, the highest tipping fees are in the southern portion of the State, while the lowest fees are in the northwest region where the cost of purchasing land for landfills tends to be less than that in more metropolitan areas to the south.

The tip fee survey includes tipping fees for asbestos, C&D, passenger tires, white goods, and yard trash. Tipping fees for some items were not available because some landfills did not allow these items in their facility or the county may ship waste to a regional landfill out of county and they do not allow that waste at their transfer station for transportation to the regional facility. A good example of this is Calhoun County which does not collect waste tires or C&D for transportation to Bay County. Wastes such as this have to be transported by the waste generator to the regional WTE or landfill at their own expense.

**The cost of disposal
for federally
regulated asbestos
is \$350.00/ton in
Jackson County.**

The average cost of disposal for federally regulated asbestos is \$116.47/ton, and ranges anywhere from \$23.00/ton in Manatee County to \$350.00/ton in Jackson County.

The average cost of disposal for C&D is \$32.06/ton, and ranges anywhere from \$5.00/ton in Okaloosa County to \$ 92.00/ton in Monroe County. [Note: The cost of disposal for C&D as reported by counties appears high and in many cases most likely does not include the disposal costs at private C&D disposal facilities which are significantly lower.]

The average cost of disposal for white goods is \$38.53/ton, and ranges anywhere from no charge in several counties to \$114.00/ton in Clay County. White goods refer to inoperative and discarded refrigerators, ranges, washers, water heaters, freezers, and other similar domestic and commercial large appliances.

The average cost of disposal for yard trash is \$30.16/ton, and ranges anywhere from \$10.00/ton in Gilchrist County to \$92.00/ton in Monroe County. Yard trash refers to vegetative matter resulting from landscaping maintenance or land clearing

operations and includes materials such as tree and shrub trimmings, grass clippings, palm fronds, trees and tree stumps.

The average cost of disposal for passenger tires is \$91.18/ton, and ranges anywhere from \$1.50/tire in Pinellas County to \$250/ton in Franklin County.

For county specific information, reference Figure 3C & Table 4D in the appendices or at:



<http://www.dep.state.fl.us/waste/categories/recycling/pages/01.htm>

It is important to understand the costs involved in the collection, recycling and disposal of municipal solid waste. The Department has a Full Cost Accounting Rule, Chapter 62-708, Florida Administrative Code, which requires local governments to calculate and inform citizens of the costs associated with the solid waste management services they provide. The local government is required to publish annually the following costs for residential and non-residential

categories: solid waste collection, solid waste disposal, and recycling. Full cost accounting provides solid waste managers with actual cost data associated with the residential and non-residential waste services they provide. It is also hoped that full cost accounting will prompt better financial tracking and overall understanding of a local government's existing program.

The Department, in conjunction with the United States Environmental Protection Agency, has completed an information booklet designed to help explain full cost accounting. The booklet explains the objectives and benefits of full cost accounting to local governments. A companion workbook contains specific instructions, checklists, and worksheets designed to assist the user in completing the many calculations necessary in full cost accounting.

Training for Operators

Landfill operator training in Florida began in 1987 as a cooperative arrangement between the Solid



Alligators are often spotted in ponds near landfills Photo: Bill Hinkley

CHAPTER 4: LANDFILL DISPOSAL

Waste Association of North America (SWANA), the University of Florida TREEO Center, and DEP. In 1988, the Solid Waste Management Act made training mandatory for all landfill operators. Training requirements were formalized in Chapter 62-703, F.A.C., in October, 1989. The Solid Waste Management Training Committee was created to help implement this training program. The committee includes solid waste professionals from local government, private industry, educational institutions and the Department of Environmental Protection. The committee has established criteria for reviewing and approving continuing education courses. Since 1989, over 1,000 operators have been trained in landfill operations.

Revisions to Section 403.716, F.S., made in 1993 added training requirements for operators of waste-to-energy facilities, biomedical waste incinerators, and mobile soil thermal treatment units or facilities. Chapter 62-703, F.A.C. has been revised to reflect these changes.

In accordance with the Governor's rule reduction effort, Chapter 62-703 was identified as a procedural rule and was repealed in December 1996. The repeal should have no effect on the training program. DEP intends to continue to interpret Section 403.716 the same way it has interpreted it in the past.



Landfill compactor in action. Photo: Bill Hinkley