



FORCE
FLORIDA COMPOSTING REGULATORY REPORT

August 2006



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SECTION 1.0 BACKGROUND AND PURPOSE

1.1 Purpose of Report

This report provides an analysis of and recommendations for solid waste regulations for organics recycling facilities for the Florida Department of Environmental Protection (FDEP). FDEP staff is aware of the need for revising the compost regulations. However, staff currently does not have the time and resources to take on the task. It is hoped that this report will 1) support the conclusion that Florida's organics recycling regulations need to be updated, 2) help FDEP establish a schedule for revising the compost regulations and 3) provide useful information during the regulatory revision process.

The reader should note that the report's scope is limited to organics recycling facilities regulated under solid waste rules. It does not include biosolids (municipal wastewater sludge) when their treatment and beneficial use are regulated under separate rules (e.g., residuals management or wastewater regulations).

Ultimately, the information in this report and discussion it may generate will help establish Florida composting regulations that further enhance diversion and proper management of organic wastes and encourage growth and diversification of the organics recycling industry in Florida.

The report has been funded through The Florida Organics Recycling Center for Excellence (FORCE) and completed by Kessler Consulting, Inc.

1.2 Methodology

The following work activities were undertaken:

- Select states for regulatory review – Seven states were chosen based on general knowledge of their efforts to promote organic waste diversion while protecting public health and the environment: California, Maine, Massachusetts, New Jersey, New York, North Carolina, and Virginia.
- Review and analyze state composting regulations – Regulations for the seven states plus Florida were reviewed and analyzed with regard to:

- Regulatory categories of organics recycling facilities (e.g., exemptions, notification, permit-by-rule, registration, and full permit)
 - Siting, design, and operating requirements for each category of facility
 - Pathogen reduction (PR) and vector attraction reduction (VAR) requirements
 - Heavy metal standards
 - Compost utilization requirements
- Interview composting regulatory personnel – Regulators in each state were interviewed to determine:
 - Proper understanding of their regulations
 - History of regulatory development
 - How the regulations have been developed to enable organics recycling
 - What barriers the regulations pose to organics recycling
 - Obtain input from the Florida organics recycling industry – During the development of this document, persons active in and familiar with organics recycling in Florida were interviewed to gather information on barriers, opportunities, and current issues. Then a draft report was widely distributed to Florida’s organics recycling industry as well as FDEP staff. Subsequently, a work session was convened to gather and discuss their comments prior to completing this final report.
 - Develop conclusions and recommendations – Based on the preceding work, specific conclusions and recommendations were developed and this final report was prepared for FDEP.

SECTION 2.0

CURRENT STATUS OF ORGANICS RECYCLING IN FLORIDA

2.1 Industry Profile

As of September 2005, organics recycling facilities in Florida included the following operating facilities:

- 198 registered or permitted yard trash processing facilities
- 5 permitted composting facilities

In addition, a small (but undetermined) number of agricultural composting facilities operate under state regulatory exemptions.

The five permitted composting facilities are Sumter County, Black Gold, Reedy Creek, Busch Gardens, and Jacksonville Zoological Gardens.

According to the latest FDEP information (2002), yard trash accounts for 12.6% of MSW generated in Florida. Food waste accounts for 5.3%.

According to the most recent data available from FDEP, Florida recycled approximately 51% of its yard trash in 2002 (3,668,008 tons generated and 1,855,302 tons recycled). Very little organic waste other than yard trash is diverted from disposal. Food waste diversion during 2002 was calculated at 2.4%. Over 1.5 million tons per year of food waste and over 1.8 million tons of yard trash were discarded.* If this material had been diverted from disposal it would have increased Florida's recycling rate by 11%. Clearly, this other organic waste represents a major opportunity for increasing Florida's recycling rate.

By and large, Florida can be best summarized as a yard trash processing state with very few composting operations. For a variety of reasons (regulatory, waste composition, and marketplace dynamics), the vast majority of organics recycling takes place at yard trash processing (chipping and grinding) facilities. These facilities produce mulches, process fuel, land application materials, soil amendments, and soil mix ingredients.

* Florida DEP, 2002 Solid Waste Management Data,
www.dep.state.fl.us/waste/categories/recycling/pages/02_data.htm

Typically, yard trash processing facilities grind material and screen it. Screened “overs” are mostly used as fuel, alternative daily cover, and cover for large land reclamation project. Screen “unders” are generally used as soil amendment or an ingredient in bagged potting soil. Depending on the use, ground-up yard trash may be piled and allowed to go through initial heating in order to destroy weed seeds.

2.2 Florida-specific Organics Recycling Issues

The following paragraphs summarize key aspects of Florida’s organics recycling industry and factors influencing it.

Composition of Yard Trash

A significant portion of the yard trash generated in Florida tends to be resistant to decomposition due to its lignaceous and woody character.

Quantity of Yard Trash

Florida’s subtropical climate means year-round generation of yard trash and quantities that represent an estimated 12.6% percent of MSW. In order to divert this material from disposal and properly handle it, communities need large scale facilities.

Storm Debris

As demonstrated in 2004, Florida is sometimes hit by major storms that generate vast amounts of yard trash. At the time of writing, an official estimate of the quantity of yard trash generated by the hurricanes was not available. But it likely was on a magnitude of tens of millions of cubic yards. The existing registration process for yard trash processing facilities can help facilitate processing of storm debris from natural disasters by providing an expedited licensing process.

Difficulty Composting Yard Trash

Very little of Florida’s yard trash is truly composted (i.e., complete decomposition into a stable, mature humus-like product). Several factors contribute to this marketplace reality. First, much of the yard trash is woody material that is more suitable as a bulking agent rather than a primary compost feedstock. Second, to fully compost yard trash would require land area and expense that is not easily justified given prevailing tipping fees and compost value. Thirdly, current

demand for compost is not well-developed, especially given the amount of compost that could potentially be produced. And lastly, the existing regulations strongly favor processing versus composting because all facilities, other than those that are exempt or registered as yard trash processing, must obtain a full permit. Thus if a facility wished to compost nitrogenous waste (such as source separate food waste) with yard trash, they would need to obtain a full permit.

Other Organic Waste

Florida citizens and businesses generate large amounts of organic waste other than yard trash. According to state estimates, Florida generated more than 1.5 million tons of food waste in 2002 of which only 2 percent was diverted from disposal. In addition, an undetermined amount of non-recyclable paper (e.g., tissue and towels, waxed cardboard, soiled paper, and wet paper) was generated and disposed. Most state and local governments at the forefront of solid waste management now operate residential and commercial food waste diversion programs. Good reasons exist for similar efforts in Florida: moist organic waste is a major component of MSW, it causes environmental and operational challenges for landfills and incinerators, and it is readily compostable, especially if mixed with yard trash as a bulking agent.

Fertilizer Rules

Any agricultural or horticultural product that claims to contain a guaranteed amount of nutrients must be registered and certified with the state. For example, if a compost product claims a guaranteed analysis of 1-1-1 for nitrogen, phosphorus, and potassium, the producer must register that product with the state, provide lab analyses that document its contents, comply with state fertilizer rules, and pay a fertilizer tax. This presents a barrier to compost for several reasons. Compost is primarily a soil amendment; it is not a concentrated fertilizer. Compliance with state fertilizer regulations requires too much time and expense, and constrains compost producers from promoting and marketing compost based in any way on its nutritive value.

Existing Agricultural Exemptions

Existing regulatory exemptions for agricultural composting (as part of “normal farming operations”) play a key role in establishing markets for processed yard trash. Farms are taking large amounts of processed yard trash from off-site and utilizing it for land application, soil amendment, and as bedding material for feed lots. In addition, several small compost producers utilize the agricultural exemption to avoid needing a full permit.

Regulatory Enforcement

Major yard trash processing operators express concern about two aspects of FDEP regulatory enforcement. First, inspection and enforcement at registered yard trash processing facilities is not adequate. Some registered processors file unreliable annual reports and are not inspected by FDEP to ensure regulatory compliance. Such facilities charge lower fees and have an unfair competitive advantage over those facilities that operate legitimately. Additionally, nuisances and environmental problems at poorly operated facilities give the entire industry a bad reputation. Second, given the level of autonomy at FDEP District offices with regard to permitting and enforcement there is inconsistency from District to District. The Districts have different levels of understanding and ways of interpreting the regulations. The result is an “uneven playing field”.

Low Disposal Cost

County disposal fees for 2001 (the most recent information available from FDEP) averaged \$43 for Class I waste versus \$15 to \$30 per ton for yard trash. This situation has two consequences. First, organic recycling facilities keep tip fees lower than disposal facilities in order to encourage generators of organic waste to source-separate and deliver it. Low disposal fees force low tip fees at organic recycling facilities, where tip fees can only go so low before the entire operation becomes financially unviable. The second consequence of Florida’s disposal fee structure is that it discourages composting and encourages yard trash grinding facilities. This is tied to the regulatory system and the physical character of Florida’s yard trash. Nitrogenous materials (e.g., food waste) are needed in order to compost Florida yard trash efficiently. But a facility must obtain a full permit in order to handle food waste. And the design, construction and operating costs associated with a full permit facility are too high given the “cap” on tip fees. To compost Florida yard trash without added nitrogen requires very large area and a long residence time. Thus, yard trash facilities generally do not undertake composting, but simply grind yard trash and produce mulch, fines and biomass fuel.

Emerging Opportunities for Organics Recycling

Changes in the Peat Mining Industry - Historically Florida has produced large quantities of relatively inexpensive peat. The peat has been used in a wide number of applications in the nursery, greenhouse and landscaping sectors. In recent years, changes in the peat mining industry, more stringent regulations in particular, have added significantly to the cost of peat

production causing the peat industry to look for alternatives. This has created potential opportunities for compost and composting.

Organics Recycling versus Development – Given the pace and patterns of residential and commercial development in Florida, it is becoming increasingly difficult to site organic recycling facilities. To efficiently handle organic waste from MSW (e.g., food waste and yard waste) facilities should be located near centers of population and commerce. Yet urban and suburban growth continues to encroach on existing facilities and limit possible sites for new facilities.

Water Quality Protection – Florida’s agricultural community is now required to implement nutrient management plans. Large amounts of nutrient run-off from feedlots, manure storage and fertilizer application have caused environmental damage in the form of surface and groundwater pollution. Increased use of compost and on-farm compost production could play a vital role in nutrient management plans and help address water pollution concerns. However, while regulations are in place, enforcement is lax.

County Water & Soil Conservation Boards – These Boards are working to promote compost production and use as part of their mandate to protect natural resources and maintain agriculturally productive lands. They are working to streamline permitting and operation of organic recycling facilities and promote compost utilization.

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SECTION 3.0

COMPARISON OF STATE ORGANICS RECYCLING REGULATIONS

Composting regulations from seven states were reviewed. The states represent a variety of strategies and approaches to facilitating organic waste recycling while still protecting public health and the environment. They all have established categories of organics recycling facilities and regulatory requirements based on the potential for adverse impacts. Facilities that handle feedstocks and/or quantities of organic waste posing relatively little environmental and health risk have fewer regulatory requirements.

The regulatory research focused on specific aspects:

- Regulatory categories of organics recycling facilities (e.g., exemptions, notification, permit-by-rule, registration, and full permit)
- Siting, design, and operating requirements for each category of facility
- Pathogen reduction (PR) and vector attraction reduction (VAR) requirements
- Heavy metal standards
- Compost utilization requirements

The following paragraphs summarize key aspects of the states' composting regulations. Detailed descriptions of each state's regulations are provided in Appendices A through H.

3.1 Regulatory Categories of Facilities

Table 3.1 (page 12) provides a capsule summary of each state's regulatory categories for organics recycling facilities. Please note that we only consider in this report regulations pertaining to commercial/municipal scale facilities; exemptions and rules applying to backyard composting and micro-scale facilities (e.g. less than 50 cubic yard) are not considered. While each state clearly has developed its own unique approach, a number of common practices are apparent.

On-farm Composting Exemption

All of the states provide some level of exemption for on-farm composting. States generally address environmental and public health issues related to farming operations under their agriculture regulations and/or local health codes. Florida's on-farm exemption is comparable to

others insofar as limiting it to operations that are essentially farm-based and not driven solely by commercial composting interests. For example, a farm may only bring in yard trash and manure from off-site only if (1) the compost is to be used on-site as part of agronomic, horticultural or silvicultural operations, or (2) the amount of off-site material is limited to that necessary to optimize the composting of yard trash or manure generated on the farm. Several other states establish specific thresholds for total size of operation, off-site feedstocks, and off-site product distribution.

Exemption for Specific Feedstocks & Quantities

Florida is the only state of those studied that has no other exemptions for commercial/municipal scale facilities. All seven other states provide exemptions for composting operations that handle specific feedstocks and/or limited quantities of materials. Exemptions include the following:

- Yard trash composting less than 10,000 cubic yards per year (cy/year) (NJ)
- Yard trash composting less than 3,000 cy/year (NY)
- Chipping & grinding less than 17,500 cy/year (NJ)
- Chipping & grinding any size (VA)
- Any composting operation less than 500 cy at one time and less than 1,000 cy/year distributed off-site (CA)

Simplified Procedures for Yard Trash

The seven states and Florida all have simplified regulatory procedures for certain types of yard trash facilities. Florida's regulations do not distinguish between chipping and grinding versus composting operations. Other states define chipping and grinding facilities separately from composting facilities.

Simplified procedures include notification, registration, and permit-by-rule for facilities including the following:

- Yard trash composting or chipping and grinding on less than 3 acres with less than 1 acre of storage (ME)
- Yard trash composting less than 12,500 cy/year (CA)
- Yard trash composting 3,000-10,000 cy/year (NY)
- Yard trash composting or storage less than 6,000 cy/quarter (NC)

- Yard trash composting any size with less than 25% grass and less than 5,000 cy/acre (MA)
- Yard trash processing any size provided that materials are processed to less than 6 inch size within a specified timeframe and removed from site within 18 months of processing (FL)
- Chipping & grinding less than 500 tons/day (CA)
- Chipping & grinding any size (MA)

In all cases, facilities allowed to operate under simplified regulatory procedures must comply with certain siting, design, operating, record keeping, and reporting requirements in each state's regulations.

Simplified Procedures for Composting Other Materials

Several states have established simplified procedures for composting facilities that handle certain types and quantities of organic materials other than yard trash. Florida has no comparable procedures.

- Source-separated organic waste composting less than 1,000 cy/year (NY)
- Any composting operation less than 700 tons/quarter (VA)
- Research facilities with less than 5,000 cy on-site and maximum 2 year duration (CA)
- Vegetative food waste composting less than 40 cy/day (MA)
- Food waste composting less than 20 cy/day (MA)

Reduced Procedures for Full Permit Facilities

Several states have defined certain types of facilities that, while they require a full permit, are eligible for reduced procedures such as application, design and operating, pathogen and vector attraction reduction, testing, record keeping, and reporting requirements.

- Facilities larger than 3 acres composting yard trash and vegetative waste (ME)
- Facilities composting less than 400 cy/month of moderate C:N feedstock such as produce & vegetable waste (C:N ratio between 15:1 and 25:1) (ME)
- Facilities composting less than 200 cy/month of low C:N feedstock such as fish waste (C:N ratio less than 15:1) (ME)
- Yard trash composting facilities handling more than 10,000 cy/year (NJ)
- Source-separated organic waste composting facilities any size (NJ)

- Yard trash composting facilities handling more than 10,000 cy/year (NY)
- Source-separated organic waste composting facilities handling more than 1,000 cy/year (NY)
- Yard trash composting facilities handling more than 6,000 cy/quarter (NC)
- Source-separated organic waste composting facilities handling less than 1,000 cy/year (NC)
- Facilities composting only yard trash and manure (FL)

Unique Strategies for Categorizing and Regulating Facilities

- Maine categorizes feedstocks based on C:N ratio and potential for human pathogens. Type IA residuals have C:N greater than 25:1 such as yard trash. Type IB residuals have C:N between 15:1 and 25:1 such as produce & vegetable waste. Type IC residuals have C:N less than 15:1 such as fish waste. Type II residuals may contain human pathogens.
- Massachusetts has a unique procedure whereby yard trash facilities handling less than 50,000 cy/year are eligible for registration, while larger ones are eligible for a special procedure called a Determination of Need (DON). The DON procedure enables the regulatory agency to review a proposed facility and determine whether a full permit is required. The agency may either 1) require the facility to obtain a full permit or 2) issue a determination that a permit is not required and establish specific requirements and restrictions on the facility.
- North Carolina classifies composting facilities based on the type of feedstock and the size of operation. The four types of facilities are 1) yard and garden waste, 2) pre-consumer meat-free food waste and source-separated paper, 3) meat, post-consumer food waste, and 4) mixed solid waste and biosolids. The two sizes of facilities are 1) less than 1,000 cy/quarter of Type 2, 3, or 4 waste, or less than 6,000 cy/quarter of Type 1 waste, and 2) more than 1,000 cy/quarter of Type 2, 3, or 4 waste, or more than 6,000 cy/quarter of Type 1 waste.

Table 3.1 – Summary of Organics Recycling Facility Regulations

California	Maine
<p><u>Exempt:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>On-farm:</i> AW any quantity, <1,000 cy/yr distributed off-site • <i>General compost:</i> Any material generated on-site, <500 cy at one time, & <1,000 cy/yr distributed off-site • <i>General compost:</i> <50 cy in-vessel system • <i>General compost:</i> <1 cy FW generated & used on-site 	<p><u>Exempt:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>On-farm:</i> AW <10,000 cy/yr; mortalities <20 cy/mo • <i>Type 1A compost:</i> <10 cy/mo (C:N >25:1 such as YT) • <i>Type 1B compost:</i> <5 cy/mo (C:N 15:1 – 25:1 such as manure/veg) • <i>Type 1C compost:</i> <3 cy/mo (C:N <15:1 such as fish waste)
<p><u>Notification:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>Chip & grind:</i> GW <200 tpd • <i>On-Farm:</i> AW only (no size limit) • <i>On-Farm:</i> AW & GW <12,500 cy on-site • <i>GW compost:</i> <12,500 cy on-site • <i>Biosolids:</i> on-site at POTW • <i>Research:</i> <5,000 cy on-site & 2 yr limit <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements 	<p><u>Notification/Permit-by-Rule:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>Chip & grind:</i> WW only; handling area <3 acre; storage <1 acre; <10,000 sf storage piles; plus siting, soil, operating, & reporting requirements • <i>Type 1A compost:</i> handling area <3 acre; storage <1 acre; <10,000 sf storage piles <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, record keeping & reporting requirements
<p><u>Registration:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>Chip & grind:</i> YW & WW 200-500 tpd <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements 	<p><u>Reduced Application Procedures:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>General compost:</i> Type 1A any quantity, Type 1B <400 cy/mo, &/or Type 1C <200 cy/mo <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements
<p><u>Full Permit:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>Chip & grind:</i> GW >500 tpd • <i>GW compost:</i> >12,500 cy on-site • <i>General compost:</i> FW, MW, or other materials not defined as AW or GW <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements 	<p><u>Full Permit:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>General compost:</i> Type 1B <400 cy/mo, Type 1C <200 cy/mo, or any quantity of other material; conform with siting, design, & operating requirements <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements

Table 3.1 – Summary of Organics Recycling Facility Regulations (continued)

Massachusetts	New Jersey
<p><u>Exempt:</u></p> <ul style="list-style-type: none"> • <i>On-farm:</i> any quantity of material generated & used on-site • <i>GW compost:</i> <50,000 cy/yr or <10,000 tpy, <25% grass <5,000 cy/acre, and all material generated & used on-site 	<p><u>Exempt:</u></p> <ul style="list-style-type: none"> • <i>On-farm YT compost:</i> any quantity if windrow composting & all product used on-site • <i>On-farm leaf mulching:</i> any size soil incorporation • <i>YT compost:</i> <=10,000 cy/yr YT, grass <10% of total volume • <i>Chip & grind:</i> <15,000 cy on-site, <30,000 cy/yr, & <1 year on-site
<p><u>Conditionally Exempt:</u> <u>Applicability:</u></p> <ul style="list-style-type: none"> • <i>On-farm:</i> any quantity of AW, GW, & clean paper; vegetative material <20 cy/day or <10 tpd; & FW <10 cy/day or 5 tpd • <i>YT compost:</i> <50,000 cy/yr or <10,000 tpy, <25% grass, & <5,000 cy/acre • <i>ICI or zoo compost:</i> <4 cy/week or 2 tpw • <i>Chip & grind:</i> WW any quantity <p><u>Requirements:</u></p> <ul style="list-style-type: none"> • <i>On-farm & YT compost:</i> register with state • <i>ICI compost & chip/grind:</i> notify state & local health board 	<p><u>Notification/Registration/Permit-by-Rule:</u> None</p>
<p><u>Determination of Need (DON):</u> <u>Applicability:</u></p> <ul style="list-style-type: none"> • <i>On-farm:</i> any facility not exempt or conditionally exempt • <i>General compost:</i> YT >50,000 cy/yr or >10,000 tpy, & <5,000 cy/acre; vegetative material <40 cy/day or <20 tpd; & FW <20 cy/day or <10 tpd <p><u>Requirements:</u></p> <ul style="list-style-type: none"> • Conform with siting & operating requirements; state decides if full permit is required 	<p><u>Full Permit with Reduced Procedures:</u> <u>Applicability:</u></p> <ul style="list-style-type: none"> • <i>YT compost:</i> >10,000 cy/yr; no grass if using minimal technology • <i>SSOW compost:</i> any quantity <p><u>Requirements:</u></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, record keeping & reporting requirements. Facilities handling SSOW must meet Federal 503 Class A PR & VAR
<p><u>Full Permit:</u> <u>Applicability:</u></p> <ul style="list-style-type: none"> • <i>General compost:</i> SSOW, MSW, biosolids co-composting, vegetative material >40 cy/day or >20 tpd; & FW >20 cy/day or >10 tpd • <i>General compost:</i> any other facility determined not conditionally exempt or granted a DON by state <p><u>Requirements:</u></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, pollutant, PR/VAR, record keeping & reporting requirements in solid waste regs. 	<p><u>Full Permit:</u> <u>Applicability:</u></p> <ul style="list-style-type: none"> • <i>General compost:</i> any facility handling mixed waste or mixed waste & biosolids <p><u>Requirements:</u></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements

Table 3.1 – Summary of Organics Recycling Facility Regulations (continued)

New York	North Carolina
<p><u>Exempt:</u></p> <ul style="list-style-type: none"> • <i>On-farm:</i> AW composting any quantity • <i>YW compost:</i> <3,000 cy/yr • <i>Chip & grind:</i> any amount 	<p><u>Exempt:</u></p> <ul style="list-style-type: none"> • <i>On-farm:</i> AW any quantity generated and used on-site
<p><u>Registration:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>YW compost:</i> 3,000-10,000 cy/yr • <i>SSOW compost:</i> <1,000 cy/yr • <i>General compost:</i> food processing waste any quantity <p><i>Requirements:</i> Conform with siting, design, & operating requirements</p>	<p><u>Notification:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>GW compost:</i> process or store <6,000 cy/quarter; <2 acre site <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, & operating requirements
<p><u>Full Permit Reduced Procedures:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>YW compost:</i> >10,000 cy/yr • <i>SSOW compost:</i> >1,000 cy/yr <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • <i>YT compost:</i> Conform with siting, design, operating, pollutant, record keeping & reporting requirements • <i>SSOW compost:</i> Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements 	<p><u>Full Permit Reduced Procedures:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>GW compost:</i> any quantity • <i>SSOW compost:</i> <1,000 cy/quarter; <2 acre site <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR, pollutant, record keeping & reporting requirements
<p><u>Full Permit:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>General compost:</i> any facility handling MW and/or biosolids <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • <i>General compost:</i> Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements 	<p><u>Full Permit:</u> <i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>SSOW compost:</i> >1,000 cy/quarter or >2 acre site • <i>General compost:</i> MW any quantity <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR/VAR, pollutant, record keeping & reporting requirements

Table 3.1 – Summary of Organics Recycling Facility Regulations (continued)

Virginia	Florida
<p><u>Exempt:</u></p> <ul style="list-style-type: none"> • <i>On-farm:</i> AW any quantity generated and used on-site; <6,000 cy/yr of YT from off-site & <18 mo on-site • <i>YT compost:</i> <500 cy/yr from off-site & no tip fee charged • <i>Chip & grind:</i> any quantity 	<p><u>Exempt:</u></p> <p><i>On-farm:</i> AW & YT must conform to state interpretation of “normal farming operations”. For compost distributed off-site, off-site material limited to that necessary to optimize composting on-farm materials. Off-site distribution must meet state classification, testing and use rules.</p>
<p><u>Notification/Registration:</u></p> <p>None</p>	<p><u>Notification:</u></p> <p>None</p>
<p><u>Permit-by-Rule:</u></p> <p><i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>YT compost:</i> any quantity • <i>General compost:</i> any compostable material <700 tons/quarter <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating requirements 	<p><u>Registration:</u></p> <p><i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>YT processing:</i> process within 6 mo., or time to receive 12,000 cy or 3,000 tons and processed material removed within 18 months of processing. <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, record keeping & reporting requirements
<p><u>Full Permit:</u></p> <p><i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>SSOW:</i> >700 tons/quarter • <i>General compost:</i> any facility handling MW or biosolids <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, PR, pollutant, record keeping & reporting requirements 	<p><u>Full Permit:</u></p> <p><i>Applicability:</i></p> <ul style="list-style-type: none"> • <i>General compost:</i> Any facility that does not qualify for on-farm exemption or YT processing registration <p><i>Requirements:</i></p> <ul style="list-style-type: none"> • Conform with siting, design, operating, pollutant, record keeping & reporting requirements in solid waste regs • Conform with PR/VAR requirements in biosolids regs

Abbreviations:

- AW = Agricultural waste, typically including manures and animal bedding
 C:N = Carbon-to-nitrogen ratio
 FW = Food waste
 GW = YT & WW
 MW = Mixed waste
 POTW = Publicly owned treatment works
 PR = Pathogen reduction
 SSOW = Source-separated organic waste
 VAR = Vector attraction reduction
 WW = Wood waste
 YT = Yard trash, typically including leaves, grass, & brush

3.2 Compost Classification and Use

Table 3.2 (page 18) summarizes how each state regulates the classification and use of compost. The states reviewed take a variety of approaches with several common themes. Common themes include the following.

Federal Pathogen Reduction Standards

The 40 CFR 503.32(a) standards are generally used for compost made from wastes that may contain human pathogens (e.g., mixed waste and biosolids). The 40 CFR 257 criteria for classification of solid waste facilities establishes standards for pathogen reduction, including process to further reduce pathogens (PFRP) – a time and temperature based technique for pathogen reduction. Some states’ regulations utilize both the CFR 257 process standards (e.g. PFRP) and the CFR 503 indicator organism standards (e.g. Salmonella and/or fecal coliform).

Federal Heavy Metal Standards

Most states base their heavy metal standards on the 40 CFR 503.13(b)(3) pollutant limits as maximum levels for compost that qualifies for unrestricted use. In some cases, the states include additional metals and/or establish lower limits for specific metals. Florida is one notable exception to this, the heavy metals standards for compost not containing biosolids are much less stringent than the standards for compost with biosolids. Non-biosolids compost is not regulated for Arsenic, Mercury, or Selenium.

Other Parameters

Several states including Florida utilize other compost quality and market-based parameters in their regulations for compost classification and use. Maine establishes standards for sharps, contaminants, stability, and soluble salts. Massachusetts does not have specific regulatory requirements for other parameters, but incorporates product quality standards into each facilities operating permit. New York compost quality regulations address maturity, contaminants, particle size, and process detention time. Florida regulations include foreign matter, texture and maturity in classifying composts for distribution and use.

Compost for Unrestricted Distribution and Use

All states establish standards for compost that can be distributed and used without restrictions. California, New Jersey, and Virginia require that essentially all compost must meet minimum quality standards and then its use is not regulated. Massachusetts, North Carolina, and Virginia exempt essentially all yard trash compost from testing and usage regulations. Maine, New York, and Florida presume that all yard trash compost meets certain minimum standards and its distribution and use is unrestricted.

Table 3.2 – Compost Product Classification & Use Regulations

California	Maine																					
<p><u>Compost Classifications:</u> <i>All compost:</i> any facility producing and distributing >1,000 cubic yards per year</p>	<p><u>Compost Classifications:</u> <i>Permit by rule compost:</i> compost made from Type I or II residuals (eg., YT & SSOW) <i>Other compost:</i> compost other than the above</p>																					
<p><u>Compost Grades:</u> California does not have specific grades of compost for testing and utilization. All compost must meet standards as follows:</p> <ul style="list-style-type: none"> • <i>PR:</i> all compost must meet Federal 503 Class A pathogen standards • <i>Metal limits:</i> all compost produced from biosolids or mixed waste: <table style="margin-left: 20px; border: none;"> <tr> <td>As 41</td> <td>Cd 39</td> <td>Cr 1200</td> </tr> <tr> <td>Cu 1500</td> <td>Pb 300</td> <td>Hg 17</td> </tr> <tr> <td>Ni 420</td> <td>Se 36</td> <td>Zn 2800</td> </tr> </table> 	As 41	Cd 39	Cr 1200	Cu 1500	Pb 300	Hg 17	Ni 420	Se 36	Zn 2800	<p><u>Compost Grades:</u> <i>Permit by rule compost:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> If compost made from biosolids or residuals with < 15:1 C:N, PFRP and Federal 503 Class A pathogen standards • <i>Metal limits:</i> for compost made from Type I or II residuals <table style="margin-left: 20px; border: none;"> <tr> <td>As 10</td> <td>Cd 10</td> <td>Cr 1000</td> </tr> <tr> <td>Cu 1000</td> <td>Pb 300</td> <td>Hg 6</td> </tr> <tr> <td>Mb 75</td> <td>Ni 200</td> <td>Se 100</td> </tr> <tr> <td>Zn 2000</td> <td></td> <td></td> </tr> </table> • <i>Other parameters:</i> sharps <1 item per 10 tons; synthetic objects <0.05% by weight; stability must be measured; if salts >2 mmhos/cm usage information is required <p><i>Class A compost:</i></p> <ul style="list-style-type: none"> • Satisfy Class A Pathogen Reduction and Class A Vector Attraction Reduction standards in accordance with Chapter 419 for land application <p><i>Class B compost:</i></p> <ul style="list-style-type: none"> • does not pass all the standards of Class A compost above 	As 10	Cd 10	Cr 1000	Cu 1000	Pb 300	Hg 6	Mb 75	Ni 200	Se 100	Zn 2000		
As 41	Cd 39	Cr 1200																				
Cu 1500	Pb 300	Hg 17																				
Ni 420	Se 36	Zn 2800																				
As 10	Cd 10	Cr 1000																				
Cu 1000	Pb 300	Hg 6																				
Mb 75	Ni 200	Se 100																				
Zn 2000																						
<p><u>Distribution & Use:</u> <i>All compost:</i> unrestricted distribution & use</p>	<p><u>Distribution & Use:</u> <i>Permit by rule compost:</i> unrestricted distribution & use <i>Class A compost:</i> unrestricted use <i>Class B compost:</i> land application only</p> <p>The compost producer must provide consumers with a BMP (Best Management Practices) Manual for compost usage.</p>																					

Table 3.2 – Compost Product Classification & Use Regulations (continued)

Massachusetts	New Jersey
<p><u>Compost Classifications:</u> <i>YT compost:</i> exempt from testing and usage regulations <i>General compost w/o biosolids:</i> applicability of regs subject to state determination <i>Compost with biosolids:</i> subject to grades, testing & use regulations described below</p>	<p><u>Compost Classifications:</u> <i>YT compost:</i> all compost made only from YT <i>General compost:</i> all compost made from feedstocks other than yard trash</p>
<p><u>Compost Grades:</u> <i>Type I:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> PFRP • <i>Metal limits:</i> Cd 14 Cr 1000 Pb 300 Hg 10 Ni 200 B 300 Zn 2500 Mb10 Cu 1000 PCBs 1 <p><i>Type II:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> PSRP or PFRP • <i>Metal limits:</i> Cd 25 Cr 1000 Pb 1000 Hg 10 Ni 200 B 300 Zn 2500 Mb10 Cu 1000 PCBs 10 <p><i>Type III:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> PSRP or PFRP • <i>Metal limits:</i> exceeds Type II limits <p><i>Other parameters:</i></p> <ul style="list-style-type: none"> • Contaminants, particle size, stability, salts, etc. not in regs, but established in permit 	<p><u>Compost Grades:</u> <i>YT and General Compost:</i></p> <ul style="list-style-type: none"> • <i>Metal limits:</i> Federal 503 pollutant limits As 41 Cd 39 Cu 1500 Pb 300 Hg 17 Ni 420 Se 100 Zn 2800 <p><i>Food Waste and Sludge compost:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> Federal 503 Class A pathogen standards • <i>VAR:</i> Federal 503 Vector Attraction Reduction standards • <i>Metal limits:</i> Federal 503 pollutant limits As 41 Cd 39 Cu 1500 Pb 300 Hg 17 Ni 420 Se 100 Zn 2800
<p><u>Distribution & Use:</u> <i>Type I:</i> unrestricted distribution & use <i>Type II:</i> prior state approval required; any type of vegetation <i>Type III:</i> prior state approval required; non-food chain crops MA does not regulate sale or distribution of compost from conditionally exempt facilities</p>	<p><u>Distribution & Use:</u> <i>All compost:</i> unrestricted distribution & use if it passes the 40 C.F.R. 503 regulations; all compost must have label or information describing usage and any restrictions</p>

Table 3.2 – Compost Product Classification & Use Regulations (continued)

New York	North Carolina
<p><u>Compost Classifications:</u> <i>YT compost:</i> compost made from YT <i>SSOW compost:</i> compost made from SSOW and YT <i>Other compost:</i> compost made from MSW <i>Biosolids compost:</i> compost made with biosolids</p>	<p><u>Compost Classifications:</u> <i>YT compost:</i> compost made from YT and clean WW <i>Grade A compost:</i> compost from other feedstocks that meets Grade A restriction <i>Grade B compost:</i> compost from other feedstocks that meets Grade B restriction</p>
<p><u>Compost Grades:</u> <i>YT compost:</i></p> <ul style="list-style-type: none"> • <i>Metal limits:</i> Compost must not exceed As 41 Cd 10 Cr 1000 Cu 1500 Pb 300 Hg 10 Mo 40 Ni 200 Se 100 Zn 2500 <p><i>SSOW compost:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> PFRP and Federal 503 Class A pathogen standards • <i>VAR:</i> One of three Federal 503 Vector Attraction Reduction standards • <i>Metal limits:</i> Compost must not exceed As 41 Cd 10 Cr 1000 Cu 1500 Pb 300 Hg 10 Mo 40 Ni 200 Se 100 Zn 2500 • <i>Other parameters:</i> mature; <2% contaminants; <10mm particle size; ≥50 days total detention time <p><i>Other compost and Biosolids compost:</i></p> <ul style="list-style-type: none"> • <i>PR & VAR:</i> same as for SSOW compost • <i>Metal limits:</i> No more than 10% of total feedstocks received may exceed average concentrations: As 41 Cd 21 Cr 1000 Cu 1500 Pb 300 Hg 10 Mo 40 Ni 200 Se 100 Zn 2500 Compost same as for SSOW compost • <i>Other parameters:</i> same as for SSOW compost 	<p><u>Compost Grades:</u> <i>YT compost:</i> contains minimal pathogenic organisms, free of offensive odors, and contains no sharp particles <i>Grade A compost:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> Federal 503 Class A pathogen standards • <i>VAR:</i> Federal 503 Vector Attraction Reduction standards • <i>Metal limits:</i> Meet Federal 503 pollutant concentrations As 41 Cd 39 Cu 1500 Pb 300 Hg 17 Ni 420 Se 36 Zn 2800 Or meet Federal 503 ceiling concentrations As 75 Cd 85 Cu 4300 Pb 840 Hg 57 Ni 420 Se 100 Zn 7500 And comply with Federal 503 cumulative & annual loading limits • <i>Other parameters:</i> <6% contaminants; <1in particle size <p><i>Grade B compost:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> PFRP for facilities handling potentially pathogen-carrying wastes • <i>VAR:</i> Federal 503 Vector Attraction Reduction standards • <i>Metal limits:</i> Meet Federal 503 ceiling concentrations as above and comply with Federal 503 cumulative & annual loading limits • <i>Other parameters:</i> same as for Grade A

Table 3.2 – Compost Product Classification & Use Regulations (continued)

New York (continued)	North Carolina (continued)
<p><u>Distribution & Use:</u></p> <ul style="list-style-type: none"> • <i>YT compost</i>: unrestricted distribution & use • <i>SSOW compost</i>: unrestricted distribution & use • <i>Other compost</i>: unrestricted distribution & use <p>Biosolids compost: wait 38 mo. prior to using it in food crops</p>	<p><u>Distribution & Use:</u></p> <p><i>YT compost</i>: unrestricted distribution & use</p> <p><i>Grade A compost</i>: unrestricted distribution & use</p> <p><i>Grade B compost</i>: restricted to land and mine reclamation projects and non-food chain crops</p> <p>Facilities must provide instructions to compost users that includes grade classification, recommended uses, application rates, usage restrictions, and total nitrogen (for products containing biosolids)</p>

Table 3.2 – Compost Product Classification & Use Regulations (continued)

Virginia	Florida																																																			
<p><u>Compost Classifications:</u> <i>YT compost:</i> exempt from testing and usage regulations <i>General compost w/o biosolids:</i> applicability of regs subject to state determination</p>	<p><u>Compost Classifications:</u> <i>General compost:</i> all compost must comply with testing & usage requirements based on compost grade</p>																																																			
<p><u>Compost Grades:</u> Virginia does not have specific grades of compost for testing and utilization. All compost must meet standards as follows:</p> <ul style="list-style-type: none"> • <i>Compost stability:</i> as determined by temperature, Dewar flask, SOUR, Solvita. CO2 evolution • <i>PR:</i> all compost produced from biosolids or mixed waste must meet Federal 503 Class A standards • <i>Metal limits:</i> all compost produced from biosolids or mixed waste: <table style="margin-left: 20px; border: none;"> <tr> <td>As 41</td> <td>Cd 21</td> <td>Cu 1500</td> </tr> <tr> <td>Pb 300</td> <td>Hg 17</td> <td>Mb 54</td> </tr> <tr> <td>Ni 420</td> <td>Se 28</td> <td>Zn 2800</td> </tr> </table> 	As 41	Cd 21	Cu 1500	Pb 300	Hg 17	Mb 54	Ni 420	Se 28	Zn 2800	<p><u>Compost Grades:</u> <i>Type Y & YM:</i> Made from YT or YT & manure, mature/semi-mature, any texture, <2% foreign matter, low metals <i>Type A:</i> Made from other wastes, mature, fine texture, <2% foreign matter, low metals <i>Type B:</i> Made from other wastes, mature/semi-mature, fine/medium texture, <4% foreign matter, low/medium metals <i>Type C:</i> Made from other wastes, mature/semi-mature, any texture, <10% foreign matter, low/medium/high metals <i>Type D:</i> Made from other wastes, not mature, any texture, <10% foreign matter, low/medium/high metals <i>Type E:</i> Made from other wastes, metals exceed standards</p> <p><u>Metals Limits:</u></p> <table style="margin-left: 20px; border: none;"> <thead> <tr> <th></th> <th style="text-align: center;">Low</th> <th style="text-align: center;">Medium</th> <th style="text-align: center;">High</th> </tr> </thead> <tbody> <tr> <td>Cd</td> <td style="text-align: center;"><15</td> <td style="text-align: center;">15-30</td> <td style="text-align: center;">30-100</td> </tr> <tr> <td>Cu</td> <td style="text-align: center;"><450</td> <td style="text-align: center;">450-900</td> <td style="text-align: center;">900-3000</td> </tr> <tr> <td>Pb</td> <td style="text-align: center;"><500</td> <td style="text-align: center;">500-1000</td> <td style="text-align: center;">1000-1500</td> </tr> <tr> <td>Ni</td> <td style="text-align: center;"><50</td> <td style="text-align: center;">50-100</td> <td style="text-align: center;">100-500</td> </tr> <tr> <td>Zn</td> <td style="text-align: center;"><900</td> <td style="text-align: center;">900-1800</td> <td style="text-align: center;">1800-10000</td> </tr> </tbody> </table> <p><u>Biosolids Compost Grades:</u> <i>Class AA:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> Fed 503 Class A • <i>Metal limits:</i> (Federal 503 pollutant conc.) <table style="margin-left: 20px; border: none;"> <tr> <td>As 41</td> <td>Cd 39</td> <td>Cu 1500</td> </tr> <tr> <td>Pb 300</td> <td>Hg 17</td> <td>Ni 420</td> </tr> <tr> <td>Se 100</td> <td>Zn 2800</td> <td></td> </tr> </table> <p><i>Class A:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> Fed 503 Class A • <i>Metal limits:</i> (Fed 503 ceiling conc.) <table style="margin-left: 20px; border: none;"> <tr> <td>As 75</td> <td>Cd 85</td> <td>Cu 4300</td> </tr> <tr> <td>Pb 840</td> <td>Hg 57</td> <td>Ni 420</td> </tr> <tr> <td>Se 100</td> <td>Zn 7500</td> <td></td> </tr> </table> <p><i>Class B:</i></p> <ul style="list-style-type: none"> • <i>PR:</i> Fed 503 Class B • <i>Metal limits:</i> (Fed 503 ceiling conc.) 		Low	Medium	High	Cd	<15	15-30	30-100	Cu	<450	450-900	900-3000	Pb	<500	500-1000	1000-1500	Ni	<50	50-100	100-500	Zn	<900	900-1800	1800-10000	As 41	Cd 39	Cu 1500	Pb 300	Hg 17	Ni 420	Se 100	Zn 2800		As 75	Cd 85	Cu 4300	Pb 840	Hg 57	Ni 420	Se 100	Zn 7500	
As 41	Cd 21	Cu 1500																																																		
Pb 300	Hg 17	Mb 54																																																		
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As 75	Cd 85	Cu 4300																																																		
Pb 840	Hg 57	Ni 420																																																		
Se 100	Zn 7500																																																			

Table 3.2 – Compost Product Classification & Use Regulations (continued)

Virginia (continued)	Florida (continued)
<p><u>Distribution & Use:</u> All compost meeting above standards qualifies for unrestricted use; compost not meeting the standards is classified as solid waste.</p>	<p><u>Distribution & Use:</u> <i>Types Y, YM, & A:</i> unrestricted use <i>Type B:</i> agricultural or ICG use, public contact allowed <i>Type C:</i> agricultural or ICG use, public contact not allowed <i>Type D:</i> LF cover and land reclamation; public contact not allowed <i>Type E:</i> must be disposed</p>

Abbreviations:

- C:N = carbon-to-nitrogen
- ICG = institutional, commercial, governmental
- LF = landfill
- PFRP = process to further reduce pathogens
- PR = pathogen reduction
- PSRP = process to significantly reduce pathogens
- SSOW = source-separated organic waste
- WW = wood waste
- YT = yard trash

SECTION 4.0

RECOMMENDATIONS FOR FLORIDA ORGANICS RECYCLING REGULATIONS

Organics recycling facilities provide a number of potential environmental benefits including diversion of organic waste from incineration and landfill, treatment of pathogenic organisms, and stabilization of nutrients and organic compounds. Compost has numerous potential benefits as well, including erosion control, moisture retention, improved soil texture, improved soil ecology, and increased soil organic matter content. At the same time, poorly operated organics recycling facilities can cause various negative environmental impacts such as water contamination, odors, dust, noise, and traffic.

One major goal of state regulations is to strike the right balance between protecting human health and the environment while promoting the benefits of organics recycling. State regulations have a significant impact on the organics recycling industry. They must calibrate the level of regulatory control to the level of risk as well as the realities of the waste stream and waste management industry in the state.

Current Florida regulations and policy determinations only provide exemption for on-farm composting and registration for facilities that handle yard trash.* All other composting facilities must obtain a Solid Waste Management Facility Permit, which requires extensive investment in design, engineering, construction, and operations. Yard trash processing facilities dominate the state's organics recycling industry.

While one may argue that regulations are only part of the picture and that economics have a lot to do with defining the character of the organics recycling, it is important to understand that the cost of complying with full permit regulations is a significant deterrent in Florida. Regulatory costs are not limited to the cost of submitting and obtaining a permit; there are capital costs and ongoing operating costs to meet the design, construction, operating, and reporting requirements associated with a full permit.

Lastly, we must remember that regulations are not the only tool available to the state for promoting organics recycling. California, Massachusetts, Maine, and North Carolina have

* Note: like all other states considered in this report, Florida exempts very small scale composting operations, i.e. back yard composting, operations producing less than 50 cubic yards per year, and operations with less than 50 cubic yard on-site.

clearly defined regulatory categories and separate waste prevention and diversion programs targeting organic waste. New Jersey and New York implemented their composting regulations many years ago along with extensive programs to promote organics recycling, which have subsequently been curtailed. This leads to the conclusion that combined efforts (progressive regulations plus promotion and development) are essential to creating an environment that supports a healthy and growing organics recycling industry.

FDEP staff believes that changes are needed in the compost regulations. However, because there are several other regulatory chapters currently open, staff currently does not have the time and resources to take on review and revision of the compost regulations. It is hoped that the information contained in this report will ultimately 1) help FDEP commit to a schedule for revising the compost regulations and 2) provide FDEP with information to use during the regulatory revision process.

The following sections offer recommendations to FDEP. These recommendations derived from a) extensive review of other states' regulations as summarized in Section 3.0, b) existing Florida regulations, and c) discussions and input from organics recyclers in Florida. And they can be summarized as follows:

- Establish a more complete system of tiered facility classifications. All of the other states studied have reduced regulatory burden for a much wider array of facilities than Florida.
- Modify regulatory definitions for feedstocks and procedures in support of the tiered facility classification.
- Simplify the types of compost defined by regulation and update the pollutant standards.
- Establish a multi-stakeholder process for draft rule making and public comment.
- Implement an outreach and development program targeted at increasing recovery and beneficial use of organic materials.

The following subsections provide specific recommendations in each of these areas.

4.1 Regulatory Definitions

Change the Term “Yard Trash”

The term “yard trash” is unique to Florida. Throughout the U.S. this component of municipal solid waste is generally called either “yard waste” or “yard debris”. Since the general focus is to consider this material a resource rather than a waste that should be disposed, it is recommended that Florida adopt the term “yard debris” consistently across statutes, rules, and programs.

Materials

Florida should define specific categories of materials handled by organics recycling facilities as part of a more comprehensive facility classification system. The following specific terms should be defined and utilized consistently across applicable Florida regulations.

- *Amendment* – to consist of materials mixed with feedstocks in order to adjust the physical, biological, or chemical characteristics of the feedstock and create favorable conditions for composting. Amendments do not include Feedstocks.
- *Additive* – to consist of materials mixed with finished or partially finished products to improve physical, biological, or chemical characteristics of the product for beneficial use.
- *Biosolids* – residuals from permitted municipal waste water treatment plant
- *Feedstock* – means any biodegradable material used at an organics recycling facility including Yard Debris, Vegetative Material, Woody Material, Food Waste, Biosolids, and Municipal Solid Waste.
- *Food Material* – to consist of source-separated pre-consumer and post-consumer materials such as fruits, vegetables, grains, fish and animal products and byproducts, and non-recyclable soiled paper and cardboard from human food preparation and consumption activities.
- *Manure* – to consist of solid or semi-solid animal excreta and residual organic materials used for bedding, sanitation or feeding purposes of such animals.

- *Vegetative Food Material* – to consist of Food Materials, excluding fish and animal products and byproducts as well as post-consumer materials.
- *Woody Material* – to consist of source-separated trees, stumps, lumber, bark, wood chips, shavings, sawdust, etc. that are free of metals, plastics, treatments, coating, and paint.
- *Yard Debris* – to consist of source-separated leaves, grass, brush, palm fronds and other vegetative material resulting from landscaping maintenance or land clearing operations.

Products and Procedures

Florida should define specific organic waste recycling procedures and products to eliminate confusion and support a more comprehensive facility classification system. The following specific terms should be defined and utilized consistently across applicable Florida regulations.

- *Chipping and Grinding* – the process of size reducing, screening, and otherwise handling Yard Debris or Woody Material, and specifically excluding Composting.
- *Compost* – the stable organic product produced by Composting that can be handled, stored or applied to the land without adversely affecting public health or the environment.
- *Composting* – the process of complete accelerated aerobic biodegradation of organic materials under controlled conditions. The definition of composting should not include disinfection; instead pathogen reduction standards are included for certain types of composting operations.
- *Curing* – the final stage of Composting after most of the readily metabolized material has been decomposed where biodegradation continues and produces a Stable product.
- *Mulch* – the organic product produced by Mulching that can be handled, stored or applied to the land without adversely affecting public health or the environment.
- *Mulching* – the process of partial aerobic biodegradation of Yard Debris and Woody Material.

- *Landspreading* – the process of spreading Yard Debris and Woody Material on agricultural or horticultural lands for the purpose of long term decomposition and soil incorporation.
- *Process Fuel* – an organic product produced by Chipping and Grinding that can be handled, stored and utilized as renewable biomass fuel for heat, steam, or power production.
- *Stable (Stability / Stabilization)* – The characteristic of a material in which biological chemical degradation has diminished to a level so that the material no longer poses a pollution, health, or safety hazard and will not generate offensive odors during storage, handling or ultimate use.
- *Mature (Maturity)* – The characteristics of a material that render it harmless to plants when used as a soil amendment and make it sufficiently stable so that it does not generate offensive odors during storage, handling or ultimate use.

4.2 Regulatory Classification of Organic Recycling Facilities

Florida should establish a facility classification system that is based on a combination of feedstocks and facility size. The recommended approach is to create a multi-tiered classification with increasing levels of regulatory control for facilities that handle more putrescible and/or larger quantities of organic materials. Small facilities, as well as those handling less putrescible materials, would have fewer regulatory requirements than large ones. Table 4.1 (page 33) summarizes the recommended classification system.

Exempt Operations

The following facilities are exempt from solid waste regulations provided that: a) they do not produce unreasonable dust or odor impacts on neighbors; b) they do not violate environmental regulations; and c) Feedstocks are processed within 48 hours of receipt.

- *Backyard composting* – composting by the resident/tenant of source-separated organic wastes generated on-site and composted on-site
- *On-site composting* – composting operations located at institutional, commercial, or industrial sites

- Feedstocks: Yard Debris, Woody Material, Vegetative Food Material, Food Material and Manure
 - Size: not exceeding 100 cy on site at any one time
- *Landspreading* – These are agricultural / horticultural operations that handle size-reduced Yard Debris and Woody Waste and directly spread it in a layer and incorporate it into the soil to slowly decompose.
 - Feedstocks: Yard Debris and Woody Material
 - Size: not exceeding 100 acres; depth of materials not exceeding 3 feet; all materials used on site
- *Chipping and grinding* – These facilities handle and process Yard Debris and Woody Materials, reduce the particle size, and may keep size-reduced materials on site for relatively short periods of time to produce biomass fuel, mulch and other products.
 - Feedstocks: Yard Debris and Woody Material
 - Size: not exceeding 50,000 cy/yr incoming material; not exceeding 15,000 cy on site at any one time; 1 year maximum retention time
- *Agricultural composting* – These are facilities meeting the definition of “normal farming operations” that handle source-separated Feedstocks generated on site as well as off-site source-separated Feedstocks.
 - Feedstocks: Yard Debris, Woody Material, and Manure; minimum 35:1 C:N ratio in active composting
 - Size: not exceeding 50,000 cy/yr; not exceeding 5,000 cy/acre; 18 month maximum retention time
- *Yard Debris composting* – These facilities handle and process Yard Debris and Woody Waste and keep materials in process long enough to produce Stable Compost.
 - Feedstocks: Yard Debris and Woody Material; minimum 35:1 C:N ratio in active composting
 - Size: not exceeding 50,000 cy/yr; not exceeding 5,000 cy/acre; 18 month maximum retention time

Registration Facilities

The following facilities are permitted to operate so long as they a) submit basic information to FDEP; b) conform to specific siting, design, operating, pollutant limit, record keeping and reporting requirements; and c) are registered with FDEP. Products produced by the these facilities are presumed to meet Class AA Compost and Mulch product standards (see Section 4.3); product testing is not required.

- *Research and demonstration sites* – These are temporary operations that test, evaluate, or demonstrate a new or innovative technology or process modification.
 - Feedstocks: Yard Debris, Woody Material, Vegetative Food Material, Food Material and Manure
 - Time limit: 18 months, with no more than 2 one-year extensions
 - Size: not exceeding 10,000 cy/yr; not exceeding 5,000 cy/acre; 18 month maximum retention time
- *Landspreading*
 - Feedstocks: Yard Debris and Woody Material
 - Size: any size; depth of materials not exceeding 3 feet; all materials used on site
- *Chipping and grinding*
 - Feedstocks: Yard Debris and Woody Material
 - Size: any size; 1 year maximum retention time
- *Agricultural composting*
 - Feedstocks: Yard Debris, Woody Material, Vegetative Food Material, and Manure; minimum 35:1 C:N ratio in active composting
 - Size: any size; not exceeding 5,000 cy/acre; 18 month maximum retention time
- *Yard Debris composting*
 - Feedstocks: Yard Debris, Woody Material and Manure; minimum 35:1 C:N ratio in active composting
 - Size: any size; not exceeding 5,000 cy/acre; 18 month maximum retention time
- *Source-separated Organic Material composting* – These facilities handle source-separated Feedstocks and produce Stable Compost.
 - Feedstocks: Yard Debris, Woody Material, Vegetative Food Material and Manure; minimum 35:1 C:N ratio in active composting
 - Size: any size; not exceeding 5,000 cy/acre; 18 month maximum retention time

General Permit Facilities

This category of facility is permitted to operate so long as they a) submit basic information to FDEP; b) conform to specific siting, design, operating, pathogen reduction, vector attraction reduction, pollutant limit, product testing, record keeping and reporting requirements; and c) are approved by FDEP. The general permit procedure reduces the burden of work for both FDEP and the facility, while still assuring protection of the environment and public health. FDEP uses general permit procedures for many types of activities (see Air Resource Management and Mine Reclamation rules) which have been deemed to cause minimal adverse environmental impact

when performed according to minimum standards. The following operations are eligible for general permit.

- *Yard Debris composting*
 - Feedstock: Yard Debris, Woody Material and Manure; minimum 20:1 C:N ratio in active composting
 - Size: any size; greater than 5,000 cy/acre; 18 month maximum retention time
- *Source-separated Organic Material composting*
 - Feedstock: Yard Debris, Woody Material, Vegetative Food Material, Food Material and Manure; minimum 20:1 C:N ratio in composting
 - Size: any size; greater than 5,000 cy/acre; 18 month maximum retention time

Full Permit Facilities

The following facilities must conform to solid waste facility permitting requirements. They differ from general permit facilities because they handle either biosolids or municipal solid waste. They are permitted to operate so long as they a) submit required information to FDEP; b) conform to specific siting, design, operating, pathogen reduction, vector attraction reduction, pollutant limit, product testing, record keeping and reporting requirements; and c) are approved by FDEP.

- *Source-separated Organic Material composting*
 - Feedstock: Biosolids, Yard Debris, Woody Material, Vegetative Food Material, Food Material and Manure
 - Size: any size
- *Municipal Solid Waste composting* – These facilities handle mixed municipal solid waste and product Stable Compost.
 - Feedstock: Municipal Solid Waste and Biosolids
 - Size: any size

Issues Related to Biosolids

It is recommended that FDEP only regulate under the residuals management rules those compost facilities that handle only biosolids (biosolids plus bulking agent) and are located at a permitted waste water treatment plant. It is recommended that all other compost facilities handling biosolids (free-standing biosolids composting facilities as well as those that compost biosolids

along with source-separated organic materials or MSW) are classified and regulated as either SSOM or MSW facilities under the solid waste rules.

Additionally, it is recommended that FDEP eliminate the current requirement that all permitted compost facilities must have a staff person who is a licensed wastewater treatment plant operator. This requirement should only apply to those facilities that handle biosolids and septage.

Table 4.1 – Summary of Regulatory Classification of Organics Recycling Facilities

Facility Type	Regulatory Category			
	Exempt	Registration	General Permit	Full Permit
Backyard Compost	Source-separated organic materials generated on site at residence			
On-site Compost	YD WM VFM FM M <100 cy on-site at any time			
Research & Demonstration		YD WM VFM FM M <10,000 cy/yr <5,000 cy/acre 18 month limit		
Landspread	YD WM <3 ft depth <100 acres →	YD WM <3 ft depth >100 acres		
Chip & Grind	YD WM <50,000 cy/yr → <15,000 cy/on-site → <1 year on-site	YD WM any size any size <1 year on-site		
Agricultural Compost	YD WM M <50,000 cy/yr → <5,000 cy/acre >35:1 C:N ratio <18 months on-site	YD WM M VFM any size <5,000 cy/acre >35:1 C:N ratio <18 months on-site		
Yard Debris Compost	YD WM → <50,000 cy/yr → <5,000 cy/acre >35:1 C:N ratio <18 months on-site	YD WM M any size <5,000 cy/acre → >35:1 C:N ratio → <18 months on -site	YD WM M any size >5,000 cy/acre >20:1 C:N ratio <18 months on -site	
Source-separated Organic Material Compost		YD WM M VFM → any size <5,000 cy/acre → >35:1 C:N ratio → <18 months on-site	YD WM M VFM FM → any size >5,000 cy/acre >20:1 C:N ratio <18 months on -site	YD WM M VFM FM B any size
MSW Compost				MSW B any size
General Requirements	Process within 48 hrs; no odor or dust problems; generally conform with environmental regulations	Conform with siting, design, operating, & limited record keeping reporting requirements	Conform with siting, design, operating, PR/VAR, pollutant, testing, record keeping & reporting requirements	Conform with siting, design, operating, PR/VAR, pollutant, testing, record keeping & reporting requirements

Abbreviations:

YD=yard debris; WM=woody material; VFM=vegetative food material; FM=food material; M=manure;

B=Biosolids; MSW=municipal solid waste; PR=pathogen reduction; VAR=vector attraction reduction

4.3 Product Classification and Use

Florida should modify its regulations that address classification, distribution and use of products produced by organic recycling facilities. The recommended approach described below establishes fewer types of compost than the current regulations and creates a unified approach to handling all types of mulch and compost with regards to pollutants.

Compost Classifications

- *Mulch* – products produced from Yard Debris, Woody Material, Vegetative Food Material, or Manure:
 - Foreign matter: <2% by weight
 - Particle size: any texture
 - Stability: not required to meet definition of Stable
 - Pollutant limit: presumed to meet Class A pollutant standards (see Table 4.2)
 - Testing: exempt and registration facilities are not required to test their product; general permit and full permit facilities must test every 20,000 tons produced or quarterly, whichever is more frequent.
 - Reporting: exempt facilities are not required to report quantities; registration facilities report annual quantities; general and full permit facilities report test results and quantities.
 - Distribution and use: unrestricted

- *Class AA Compost* – products produced from Yard Debris, Woody Material, Vegetative Food Material, or Manure:
 - Foreign matter: <2% by weight
 - Particle size: <1 inch
 - Stability: meets definition of Stable
 - Pollutant limit: presumed meet Class A pollutant standards (see Table 4.2)
 - Testing: exempt and registration facilities are not required to test their product; general permit and full permit facilities must test every 20,000 tons produced or quarterly which ever is more frequent.
 - Reporting: exempt facilities are not required to report quantities, registration facilities report annual quantities; general and full permit facilities report test results and quantities.
 - Distribution and use: unrestricted

- *Class A Compost* – products produced from feedstocks that include Food Material, Biosolids, or MSW:
 - Foreign matter: <2% by weight
 - Particle size: <1 inch
 - Pathogen reduction and vector attraction reduction: meets Federal 503 Class A standards
 - Stability: meets definition of Stable
 - Pollutant limit: meet Class A standards (see Table 4.2)
 - Test and reporting: if producing <5 cy/day on average then once every six months; if producing 5 – 50 cy/day on average then once every three months; if producing >50 cy/day on average then once every month
 - Distribution and use: unrestricted

- *Class B Compost* – products produced from feedstocks that include Food Material, Biosolids, or MSW:
 - Foreign matter: >2% by weight
 - Particle size: >1 inch
 - Pathogen Reduction and vector attraction reduction: meets Federal 503 Class A standards
 - Stability: does not meet definition of Stable
 - Pollutant limit: meet Class B standards (see Table 4.2)
 - Test and reporting: if producing <5 cy/day on average then once every six months; if producing 5 – 50 cy/day on average then once every three months; if producing >50 cy/day on average then once every month
 - Distribution and use: restricted to landfill cover, land reclamation, and non-public access agricultural, institutional, commercial or governmental use; must comply with Federal 503 pollutant annual and cumulative pollutant loading standards

Pollutant Limits

The following table provides recommended regulatory standards for heavy metals in compost.

Table 4.2 – Pollutant Standards: Maximum Allowable Concentration (mg/Kg dry weight)

<i>Pollutant</i>	<i>Class A</i>	<i>Class B</i>
Arsenic	41	75
Cadmium	39	85
Copper	1500	4300
Lead	300	840
Mercury	17	57
Nickel	420	420
Selenium	100	100
Zinc	2800	7500

4.4 Regulatory Initiatives

- Assemble a multi-stakeholder committee to review this report and establish joint recommendations for new organic recycling regulations.
- Develop proposed regulations and conduct a series of public meetings around the state to obtain input prior to the formal procedure of draft rule making and public comment.
- Improve regulatory enforcement at registered yard trash facilities to reduce non-compliance and level the playing field for those facilities that conform to regulations.

4.5 Promotion and Development

- Continue the Florida Organics Research Center for Excellence (FORCE) as a regularly funded center to develop and implement outreach, education, promotion, and market development effort statewide.
- Specifically target organic waste other than yard trash for increased diversion.
- Evaluate and select specific strategies to promote and develop recycling of source-separate organic waste. Other states’ promotion and development efforts have focused on the following:
 - Super market food waste diversion
 - Small-scale on-site composting of institutional food waste
 - Developing animal feeding opportunities for food processing residuals
 - Assisting with networking and logistics for regional food banks.
- Assist in development of public and private demonstration facilities that combine source-separate organic waste with yard trash for composting.

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Appendix A – California

Introduction

This State is working proactively to achieve high organic waste diversion rates and has different mechanisms to promote organic waste recycling. The permit category structure plays an important role with the majority of facilities in the notification and registration categories. Furthermore, the California Integrated Waste Management Board has a Waste Prevention and a Market Development Division that is responsible for promoting and increasing organic waste recycling. Additionally, California has updated its rules frequently to reflect evolution in the organics recycling industry. The first composting rules were enacted around 1993; since then four significant changes have been made with the last one made in 2003.

California composting regulations are contained generally in *Title 14, California Code of Regulations, Division 7, Chapter 3.1: Compostable Materials Handling Operations and Facilities Regulatory Requirements*. Chapter 3.1 provides special procedures for organics recycling facilities separate from other solid waste handling and disposal facilities, which are regulated under *Title 14, Division 7, Chapter 3: Minimum Standards for Solid Waste Handling and Disposal*. Composting facilities that do not qualify for regulation under Chapter 3.1 must comply with the general requirements for solid waste facilities contained in *Chapter 3: Minimum Standards for Solid Waste Handling and Disposal*.

Chapter 3.1 is divided into the following major articles:

- Article 1 – General (Sections 17850-17852).
- Article 2 – Regulatory Tiers for Composting Operations and Facilities (Sections 17855-17862.2).
- Article 3 – Report of Facility Information (Section 17863).
- Article 4 – [reserved].
- Article 5 – Composting Operation and Facility Siting and Design Standards (Sections 17865-17866).
- Article 6 – Composting Operation Standards (Section 17867).
- Article 7 – Environmental Health Standards (Sections 17868.1-17868.4).
- Article 8 – Composting Operation and Facility Records (Section 17869).
- Article 9 – Site Restoration (Section 17870).

A local enforcement agency (EA) is responsible for enforcing the regulations with review and approval by the California Integrated Waste Management Board (CIWMB).

Key Terms

The following definitions extracted from Section 17852 illustrate key terms used in California’s compost regulations.

- “Active Compost” means compost feedstock that is in the process of being rapidly decomposed and is unstable. Active compost is generating temperatures of at least 50 degrees Celsius (122 degrees Fahrenheit) during decomposition; or is releasing carbon dioxide at a rate of at least 15 milligrams per gram of compost per day, or the equivalent of oxygen uptake.
- “Additives” means material mixed with feedstock or active compost in order to adjust the moisture level, carbon to nitrogen ratio, or porosity to create a favorable condition. Additives include, but are not limited to, fertilizers and urea. Additives do not include septage, biosolids or compost feedstock.
- “Amendments” means materials added to stabilized or cured compost to provide attributes for certain compost products, such as product bulk, product nutrient value, product pH, and soils blend. Amendments do not include septage, biosolids or compost feedstock.
- “Compostable Material” means any organic material that, when accumulated, will become active compost.
- A “Compostable Material Handling Operation” or “Facility” (CMH Facility) means an operation or facility that processes, transfers or stores compostable materials. Handling of compostable materials results in controlled biological decomposition. Handling includes composting, screening, chipping and grinding, and storage activities related to the production of compost, compost feedstocks, and chipped and ground materials. The definition of CMH Facility generally includes all types of facilities (e.g., agricultural, green material, chipping and grinding, research, etc.). It does not include excluded activities.

- “Curing” means the final stage of the composting process that occurs after compost has undergone pathogen reduction, as described in Section 17868.3, and after most of the readily metabolized material has been decomposed and stabilized.
- “Feedstock” means any compostable material used in the production of compost or chipped and ground material including, but not limited to, agricultural material, green material, food material, biosolids and mixed solid waste. Feedstocks shall not be considered as either additives or amendments.
- “Food Material” means any material that was acquired for animal or human consumption, is separated from the municipal solid waste stream, and that does not meet the definition of “agricultural material.” Food material may include material from food facilities as defined in Health and Safety Code Section 113785, grocery stores, institutional cafeterias (such as, prisons, schools and hospitals) or residential food scrap collection.
- “Green Material” means any plant material that is separated at the point of generation contains no greater than 1.0 percent of physical contaminants by weight, and meets the requirements of Section 17868.5. Green material includes, but is not limited to, yard trimmings, untreated wood wastes, natural fiber products, and construction and demolition wood waste. Green material does not include food material, biosolids, mixed solid waste, material processes from commingled collection, wood containing lead-based paint or wood preservative, mixed construction or mixed demolition debris.

Regulatory Categories of Organics Recycling Facilities

California has the following categories of organics recycling facilities:

- Excluded activity.
- Pre-existing permit and notification facility.
- Notification:
 - Chipping and grinding facility.
 - Agricultural material composting facility.
 - Green material composting operation/facility.
 - Research projects.
- Registration:
 - Chipping and grinding facility.
- Solid Waste Facility Permit:

- Other compostable materials handling facility.

Regulatory requirements for each category are summarized in the following sections.

General Requirements for All Facilities

The following requirements apply to all CMH Handling operations and facilities (including Notification, Registration and CMH Handling Permit facilities).

It must be noted that Chapters 3 and 3.1 do not provide all siting and design standards. Proposed facilities must comply with California environmental law requirements as implemented by local-level enforcement agencies.

Siting & Design Standards

- *Siting on closed landfills:* Facilities must meet postclosure land use requirements.
- *Siting on intermediate cover of landfills:* Facilities must be located on stabilized compacted substrate.
- *Design standards:* Design shall use advice, as appropriate, from persons competent in engineering architecture, landscape design, traffic engineering, air quality control, and design of structures.

Operating Standards

- *Minimize impacts:* All handling activities shall be conducted in a manner that minimizes vectors, odor impacts, litter, hazards, nuisances, and noise impacts.
- *Minimize human contact:* All handling activities shall be conducted in a manner that minimizes human contact with – plus inhalation, ingestion and transportation of – dust, particulates and pathogenic organisms.
- *Load inspection:* Random checks of incoming feedstocks, additives, and amendments shall be conducted.
- *Prevent cross contamination:* Compostable materials that have undergone pathogen reduction shall not be contaminated with materials that have not undergone pathogen reduction.
- *Site access:* Prevent unauthorized access to facility by humans and animals.
- *Traffic control:* Control entrance, exit, and on-site traffic.

- *Public information:* All facilities open for public business must post signs displaying site information (owner, operator, hours, acceptable materials, fees and phone number).
- *Fire control:* Provide prevention, protection and control measures.
- *Waste disposal:* Contaminants and refuse removed shall be removed from site within 7 days.
- *Ventilation:* Enclosed facilities shall provide ventilation to prevent health impacts from decomposition gases.
- *Leachate control:* Prevent leachate contact with the public.
- *Operator training:* All operating personnel shall be trained and a training record maintained on-site.
- *Product testing:* Operations that distribute >1,000 cubic yards per year of compost, and all facilities must verify that compost meets heavy metals limits and pathogen reduction standards.
- *Site closure/restoration:* Compost site shall be restored to protect public health, safety, and the environment, including removal of all materials and residue, and cleaning of all machinery.

Pathogen Reduction and Vector Attraction Reduction

Compost products from operations that distribute >1,000 cubic yards per year of compost must not exceed the following standards:

- *Pathogens:* Fecal coliform < 1,000 MPN per gram DW and Salmonella sp. < 3 MPN per 4 grams DW.
- *Process to Further Reduce Pathogens (PFRP):* Common time and temperature standards for PFRP for in-vessel, windrow and static pile, or an alternative approved by the EA.
- *Temperature monitoring:* During PR period, daily monitoring every 150 feet of windrow or every 200 cubic yards of active compost.

Metal Limits

Compost products from operations that distribute >1,000 cubic yards per year of compost must not exceed the following maximum metal concentrations:

<i>Constituent</i>	<i>mg/Kg Dry Weight</i>
Arsenic (As)	41
Cadmium (Cd)	39
Chromium (Cr)	1,200
Copper (Cu)	1,500
Lead (Pb)	300
Mercury (Hg)	17
Nickel (Ni)	420
Selenium (Se)	36
Zinc (Zn)	2,800

Recordkeeping

- *Incoming materials record:* Record of quantity and type of feedstocks received and products produced (agricultural facilities need only record materials accepted from off-site).
- *Public complaint record:* Record of any public complaints including type, date, complainant information and corrective actions taken.
- *Special occurrences record:* Record special occurrences and methods used to resolve problems.
- *Test results:* Record of all test results.
- *Accident record:* Record of any serious injuries occurring on-site and complaints of adverse health affects attributed to the facility.
- *Maintenance of records:* All records must be kept in one place and readily accessible for 5 years.

Prohibitions (17855.2)

The following specific wastes cannot be handled by any CMH facility:

- Medical waste
- Hazardous waste
- Unprocessed mammalian tissue except when it is generated by food service industry, grocery stores or residential food scrap collection

Excluded Activities (17855)

Certain types of compostable material handling (CMH) facilities are excluded from regulation in California. These include operations that meet any of the following criteria:

- *Feedstock and size restriction:* Handling agricultural materials from an agricultural site provided that <1,000 cubic yards per year are distributed off-site (including vermicomposting and mushroom farming).
- *Feedstock and size restriction:* <500 cubic yards on-site at any one time of compostable materials (<10% food material) are generated on-site and <1,000 cubic yards per year distributed off-site.
- *Feedstock and size restriction:* Non-commercial composting <1 cubic yard of food material provided that it is generated and used on-site.
- *Process & size restriction:* In-vessel composting <50 cubic yard capacity.

Pre-existing Permits and Notifications (17855.4)

In April 2003 California revised specific regulatory tiers (categories) for composting facilities in Chapter 3.1. Composting facilities established prior to April 2003 are allowed to continue operating in accordance with a prior authorization unless the EA determines, within a specified timeframe, that a different authorization is required. If a different authorization is required, the regulations provide specified timeframes for obtaining that authorization.

Notification

Facilities that meet the following requirements are allowed to operate if they meet California's notification requirements (18103.1)

Chipping and Grinding Facility (17856)

A "Chipping and Grinding Operations and Facilities" means an operation or facility that does not produce compost, but size-reduces or otherwise handles compostable material. Chipping and grinding operations are eligible for Notification, if they meet the following requirements:

- *Feedstock restriction:* Handles only wastes allowed at a green material composting facility.
- *Size restriction:* <200 tons per day of material received.
- *Contamination restriction:* Green material shall not exceed 1% physical contamination.

- *Load inspection:* At least 1% of daily feedstock or 1 load per day shall be visually inspected to determine that physical contamination does not exceed 1%.
- *Residence time limit:* Each load of green material is removed from the site within 48 hours of receipt, with case-specific exceptions for up to 7 days.
- *Odor control:* Facility must prepare, implement and maintain an odor impact minimization plan.

If the site fails to meet the contamination restriction, the site shall be regulated as set forth in the Transfer/Processing Regulatory requirements (Chapter 3, Article 6, commencing at Section 17400). If the site fails to meet the residence time limit, then the site shall be regulated as a green material handling facility, as set forth in Chapter 3.1.

Agricultural Material Composting Facility (17856)

An “Agricultural Material Composting Operation” means an operation that produces compost from green materials or agricultural additives and/or amendments. Agricultural materials composting operations that meet the following requirements are eligible for Notification.

- *Feedstock restriction:* Handles only agricultural materials, green materials, additives or amendments.
- *Feedstock & size restriction:* If only agricultural materials are handled, then there is no limit on the quantity of compost distributed off-site.
- *Size restriction:* If green materials are handled and <1,000 cubic yards per year are distributed off-site, then there is no limit on the quantity of green material allowed on-site, unless an enforcement agency determines otherwise due to environmental or public health risk.
- *Size restriction:* If green materials are handled and >1,000 cubic yards per year are distributed off-site, then facilities shall have <12,500 cubic yards of green material on-site at any one time.
- *Site inspection:* Annual inspection by the EA is required for
 - Facilities that handle only on-site agricultural waste and distribute off-site >1,000 cubic yards per year.
 - Facilities that handle any quantity of off-site agricultural waste.
 - Facilities that handle any quantity of off-site green waste and distribute off-site <1,000 cubic yards per year.
- *Site inspection:* Quarterly inspection by the EA is required for facilities that handle any quantity of off-site green waste and distribute off-site >1,000 cubic yards per year.

- *Recordkeeping:* Sites shall record the quantity of green waste received.
- *Load inspection:* At least 1% of daily feedstock or 1 load per day shall be visually inspected to determine that physical contamination does not exceed 1%.
- *Heavy metals limits:* Green materials shall meet metal concentration limits (see below).
- *Odor control:* If the EA determines that an odor violation has occurred, then the facility must prepare, implement and maintain an odor impact minimization plan.

If the site fails to meet the contamination restriction, the site shall be regulated as set forth in the Transfer/Processing Regulatory requirements (Chapter 3, Article 6, commencing at Section 17400).

Green Material Composting Facility (17857.1)

A “Green Material Composting Operation” or “Facility” is a facility that produces compost from green material, additives and/or amendments. Green material composting facilities that meet the following requirements are eligible for Notification.

- *Feedstock restriction:* Handles only green material, manure, paper products, additives and/or amendments.
- *Size restriction:* <12,500 cubic yards of material on-site at any one time and shall be inspected quarterly by the EA.
- *Load inspection:* At least 1% of daily feedstock or 1 load per day shall be visually inspected to determine that physical contamination does not exceed 1%.
- *Odor control:* Facility must prepare, implement and maintain an odor impact minimization plan.

Research Composting Operation (17862)

A “Research Composting Operation” means a composting operation that is operated for the purpose of gathering research information on composting. Research composting operations that meet the following requirements are eligible for Notification.

- *Feedstock restriction:* Handles compostable materials, additives and/or amendments.
- *Size restriction:*
 - <5,000 cubic yards of feedstock, additives, amendments, chipped or ground material and compost on-site at any one time.

- >5,000 cubic yards may be allowed if utilizing in-vessel technology, if the EA determines that additional volume poses no additional risk.
- *Work plan:* Description of the work to be performed, research objectives, methodology, control procedures, timeframe, etc.
- *Time limit:* Notification for a research composting operation shall be reviewed after each two-year period of operation.
- *Odor control:* Facility must prepare, implement and maintain an odor impact minimization plan.

Biosolids Composting at POTWs

Composting of biosolids on-site at a permitted, publicly owned treatment works (POTW) is eligible for Notification.

- *Feedstock & size restriction:* None.
- *Odor control:* Facility must prepare, implement and maintain an odor impact minimization plan.

Registration

Chipping and Grinding Facility (17856)

A “Chipping and Grinding Operations and Facilities” means an operation or facility, that does not produce compost, but size-reduces or otherwise handles compostable material. Chipping and grinding operations are eligible for Registration if they meet the following requirements.

- *Feedstock restriction:* Handles only wastes allowed at a green material composting facility.
- *Size restriction:* 200 to 500 tons per day of material received.
- *Contamination restriction:* Green material shall not exceed 1% physical contamination.
- *Load inspection:* At least 1% of daily feedstock or 1 load per day shall be visually inspected to determine that physical contamination does not exceed 1%.
- *Residence time limit:* Each load of green material is removed from the site within 48 hours of receipt, with case-specific exceptions for up to 7 days.

If the site fails to meet the contamination restriction, the site shall be regulated as set forth in the Transfer/Processing Regulatory requirements (Chapter 3, Article 6, commencing at Section

17400). If the site fails to meet the residence time limit, then the site shall be regulated as a green material handling facility, as set forth in Chapter 3.1.

Solid Waste Facility Permit

CMH facilities not eligible for Notification or Registration must obtain a CMH Facility Permit. This includes the following:

- *Chipping and grinding facility:* >500 tons per day of materials received.
- *Green material composting facility:* >12,500 cubic yards of feedstock, compost, or chipped and ground material on-site at any one time.
- *Other facilities:* Facilities that handle food material, mixed waste or other materials that do not meet the definition of agricultural material, green material, additives or amendments.

CMH facilities that require a full solid waste facility permit must comply with the application requirements of *Title 27, Division 2, Subdivision 1, Chapter 4, Subchapter 1 and Subchapter 3, Articles 1, 2, 3 and 3.1* (commencing with Section 21450) prior to commencing operations.

Appendix B – Florida

Introduction

Florida has only three regulatory categories for organics recycling facilities: exempt, registration, and full solid waste permit. Only yard trash processing facilities are eligible for registration.

Florida’s regulatory definition of “compost” includes mulch, screenings and other products that do not fit into a strict definition of compost. Thus, yard waste processing and other facilities fall within the definition of composting facilities even though they may produce mulch and other products not fully decomposed and stabilized.

Florida composting regulations are contained in Florida Administrative Code (FAC) *Chapter 62-709: Criteria for the Production and Use of Compost Made from Solid Waste*. General provisions for solid waste management are located in *Chapter 62-701: Solid Waste Management Facilities*. The Florida Department of Environmental Protection (FLDEP) is the regulatory agency for composting facilities.

Chapter 62-709 is organized into the following sections:

- 62-709.300 General Provisions
- 62-709.320 Yard Trash Processing Facilities
- 62-709.500 Design Criteria
- 62-709.510 Operation Criteria
- 62-709.530 Testing, Recording and Reporting Requirements
- 62-709.550 Classification of Compost
- 62-709.600 Criteria for the Use of Compost

Chapter 62-701 includes the following sections that are applicable to compost facilities:

- 62-701.200 Definitions.
- 62-701.220 General Applicability.
- 62-701.300 Prohibitions.
- 62-701.315 Permit Fees for Solid Waste Management Facilities.
- 62-701.320 Solid Waste Management Facility Permit Requirements, General.

Definition of Key Terms

Chapter 62-701 contains the following definitions with direct applicability to organics recycling facilities.

- “Agricultural wastes” means the solid wastes resulting from normal farming operations, the raising and slaughtering of animals, and the processing of animal products, and orchard and field crops, which are stored, transported or disposed of as an unwanted waste material.
- “Class I waste” means solid waste that is not hazardous waste and that is not prohibited from disposal in a lined landfill under Rule 62-701.300, F.A.C.
- “Class III waste” means 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 that are not expected to produce leachate that poses a threat to public health or the environment.
- “Compost” means solid waste that has undergone biological decomposition of organic matter, and has been disinfected using composting or similar technologies, and has been stabilized to a degree that is potentially beneficial to plant growth and that is used or sold for use as a soil amendment, artificial top soil, growing medium amendment or other similar use.
- “Composting facility” means a solid waste management facility where solid waste is processed using composting technology. Processing may include physical turning, windrowing, aeration or other mechanical handling of organic matter.
- “Disinfection” means, as relates to composting, the selective destruction of pathogens indicated by a reduction in indicator organisms to less than or equal to 100 fecal coliform most probable number per gram of volatile suspended solids where the organic solid waste was maintained at or above 55 degrees Celsius for three consecutive days in a mechanical composter or in an aerated, insulated static pile, or for 15 consecutive days in an aerated windrow with at least one turning or a non-aerated windrow with at least four turnings of the windrow.

- “Foreign matter” means the inorganic and organic constituents in a solid waste stream that are not readily decomposed and that may be present in the compost. For purposes of composting regulations foreign matter is metals, glass, plastics, rubber, bones, and leather, but does not include sand, grit, rocks or other similar materials.
- “Land clearing debris” means rocks, soils, tree remains, trees, and other vegetative matter which normally results from land clearing or land development operations for a construction project. Land clearing debris does not include vegetative matter from lawn maintenance, commercial or residential landscape maintenance, right-of-way or easement maintenance, farming operations, nursery operations, or any other sources not related directly to a construction project.
- “Leachate” means liquid that has passed through or emerged from solid waste and may contain soluble, suspended or miscible materials.
- “Manure” means a solid waste composed of excreta of animals, and residual materials that have been used for bedding, sanitary or feeding purposes for such animals. For purposes of Chapter 62-709, F.A.C., manure does not mean such material generated and managed by normal farming operations.
- “Normal farming operations” means the customary and generally accepted activities, practices and procedures that farmers adopt, use or engage in during the production and preparation for market of poultry, livestock and associated farm products; and in the production, harvesting or packaging of agricultural crops that include agronomic, horticultural and silvicultural crops. Included are the management, collection, storage, composting, transportation and utilization of organic agricultural waste, and manure, and materials solely derived from agricultural crops. Note that Rule 62-709.300(10)(b), F.A.C., expands the definition of normal farming to include composting of yard trash or manure for their own use on site as part of an agricultural operation.
- “Stabilized” means that biological and chemical decomposition of the wastes has ceased or diminished to a level so that such decomposition no longer poses a pollution, health, or safety hazard. As regards composting, the term means that the compost has at least passed through the thermophilic stage, and that biological decomposition of the solid waste has occurred to a sufficient degree that will allow beneficial use.

- “Yard trash” means 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. Section 62-709.320 expands the definition of yard trash to include clean wood, which includes wood free of paint, glue, filler preservatives and other treatments.

Section 62-709.320, which deals with registration of yard trash processing facilities, includes the following additional terms.

- “Yard trash recycling facility” means a facility at which yard trash is mulched, composted, or otherwise processed into useable materials, but does not include a facility used for the disposal of yard trash.
- “Yard trash transfer station” means a facility at which yard trash is stored or held for transport to a processing or disposal facility or for use at another site. It does not include green boxes, compactor units, permanent dumpsters, or other containers from which such wastes are transported to a landfill or other solid waste management facility.

Regulatory Categories of Composting Facilities

- Exempt facilities
- Registration (yard trash processing) facilities
- Full permit facilities

Regulatory requirements for each category are summarized in the following sections.

Exempt Facilities (62-709.300 (10), FS Chapter 403, Policy Memo SWM-01.3))

The following organics recycling operations are exempt from state regulation, provided they cause no public nuisance or adverse impacts on the environment or public health.

- *Backyard composting*: The exemption provides no further definition of what qualifies for this exemption, e.g., size limit.
- *On-farm composting*: The regulatory definition of normal farming operations is expanded to include composting that meets the following restrictions:
 - *Feedstock restriction*: Any quantity yard trash, manure and other agricultural waste.

- *Product usage restriction:* On-site as part of agronomic, horticultural or silvicultural operations; however, if product is sold for off-site use, then it must meet compost classification, testing and usage requirements.
- *Micro-scale composting:* Composting operations producing 50 cubic yards in a 12 month period where the compost is used on site; and composting operations where there is no more than 50 cubic yards of material on site at any one time

Registration of Yard Trash Processing Facilities (62-709.320)

Florida has established one category of regulated organics recycling facility that does not require a full solid waste permit. Yard trash processing facilities are eligible for registration if they meet the requirements of 62-709.320 as summarized below.

Application Requirements

Owners or operators of yard trash processing facilities must submit the following information in order to register their facility. Registration must be renewed annually.

- *Contact information:* Facility name, location, address, contact information.
- *Site ownership or authorization:* If the applicant does not own the site, proof that the landowner allows a yard trash processing facility on the site.
- *Certification:* That the facility complies with the design and operation requirements.
- *Annual report:* Providing the information described below.

Design & Operating Requirements (62-701.300(2) & 62-709.320(3))

Yard trash processing facilities are exempt from the design and operating requirements for full permit facilities in 62-709.500 & 510. Instead they must comply with the following requirements.

- *Feedstock restriction:* Only yard trash and bags used to collect yard trash.
- *Processing time restriction:* All yard trash must be processed (grinding to <6 inches) within 6 months or every 12,000 cubic yards, whichever is less.
- *Storage time restriction:* All processed material must be removed within 18 months after being processed.
- *Siting:* A facility shall conform with the following buffer distances and prohibitions:
 - >100 feet from potable water supply well.

- >200 feet from public water supply well.
- >50 feet from natural or artificial body of water.
- Prohibited in area with fractured subsurface or geology (e.g., karst).
- Prohibited in area subject to flooding unless flood protection measures are in place.
- Prohibited on a public right of way
- Prohibited in a body of water
- *Site access:* An effective barrier to prevent unauthorized entry.
- *Dust control:* Methods must be in place.
- *Fire protection:* Control provisions must be in place including:
 - 20-ft wide, all-weather access road around perimeter.
 - 15-ft lanes between piles.
 - No materials >50 ft from access by fire-fighting equipment.
- *Odor control:* Operations in accordance with 62-296-320(2).

Pollutant Standards

Products from yard trash processing facilities are assumed to comply with the following limits on certain heavy metals. Testing is not required.

Table 1 – Code 1 heavy metal concentrations

<i>Metals</i>	<i>mg/Kg DW</i>
Cadmium	<15
Copper	<450
Lead	<500
Nickel	<50
Zinc	<900

Monitoring, Recordkeeping, and Reporting

Yard trash processing facilities are exempt from the recordkeeping and reporting requirements for full permit facilities in 62-709.530. However, all registered facilities must submit an annual report at the time of renewing their site registration.

- *Recordkeeping:* Monthly records of incoming and outgoing material.
- *Annual report:* Summarizing monthly records.

Compost Testing and Use (62-709.550 & 600)

It must be noted that Florida’s definition of “compost” includes mulch, screenings, and other products that do not fit into a strict definition of compost.

Yard trash processing facilities are exempt from testing requirements for full permit facilities in 62-709.530. However, they must comply with compost classification and use requirement in 62-709.550 & 600. Horticultural products from yard trash processing facilities are classified as Type Y compost. If a facility combines both yard trash and manures, then the products are classified as Type YM compost. Type Y and YM compost shall meet the following requirements:

- *Feedstocks:* Yard trash (Y) or yard trash and manure (YM).
- *Maturity:* Semi-mature or mature.
- *Particle size:* Fine, medium or coarse.
- *Foreign matter:* Type Y and YM are assumed to have <2% weight basis.
- *Heavy metal limits:* Type Y and YM are assumed to comply with the limits in Table 1.

Type Y and YM materials have unrestricted distribution and use.

Full Permit Facilities

With the exception of exempt operations and yard trash processing facilities, all other types of organics recycling facilities must obtain a solid waste management facility permit. Requirements for these facilities are summarized below.

Application Requirements (62-701.320)

All proposed facilities must submit an application to the regional FLDEP office where the facility is to be located. Application requirements include the following.

- *Contact information:* For proposed owner and operator and the location of the proposed facility.
- *Ownership:* If the applicant does not own the site, then proof that applicant has landowner’s permission is required.
- *Engineering report:* Including regional map, vicinity map, site plan, plans and drawings for all facilities, operations plan, closure plan, contingency plan, engineering calculations, and hydrogeological logs and analyses.

- *Engineering certification:* All plans, reports and information shall be certified by the project's engineer of record.

Design & Operating Requirements (709.500 & 510 and 62-701.300)

- *Siting restrictions:*
 - >500 feet from potable water supply well; >100 feet if yard trash processing only.
 - >1,000 feet from public water supply well; >200 feet if yard trash processing only.
 - >200 feet from natural or artificial body of water; >50 feet if yard trash processing only.
 - Prohibited in area with fractured subsurface or geology (e.g., karst).
 - Prohibited in area subject to flooding unless flood protection measures are in place.
 - Airport runways: conform with Subtitle D requirements if any waste is stored, disposed or processed outdoors.
- *Design requirements:* Design plans shall include vicinity map, site plan, topographic maps, description of feedstocks.
- *Impermeable surfaces:* Facilities that handle solid waste other than yard trash or manure shall have impermeable surfaces for all waste receiving, processing, curing and storage areas.
- *Leachate management:* For facilities that handle solid waste other than yard trash or manure, a leachate collection and removal system shall handle all leachate and contact water from waste receiving, processing, curing and storage areas; all leachate shall be reused or treated.
- *Storm water control:* Design standards and control structures for storm water management to prevent run-off from contacting waste; and site grading to prevent ponding of water.
- *Site access:* All-weather access and an effective barrier to prevent unauthorized entry.
- *Truck scales:* All facilities operated by or on behalf of public jurisdiction must be able to weigh solid waste received.
- *Temperature monitoring:* For facilities that handle solid waste other than yard trash or manure, at 2 feet depth in compost pile; daily during first week of composting, then weekly thereafter.
- *Dust and litter control:* Methods must be in place.
- *Fire protection:* Control provisions must be in place.

- *Odor control:* Devices, methods and practices to prevent objectionable odors in violation of 62-296.
- *Operator training:* Staff shall be properly trained to operate the facility (701.320(15)).
- *Operation requirements:* Properly operate and maintain all design features; attendant on duty at all hours; prevent mixing of incoming waste with finished compost.
- *Material storage limit:* For permitted yard trash and manure composting facilities, unprocessed feedstocks shall be removed at least monthly; other materials received shall be removed within 72 hours, or 1 year if recovered materials.
- *Material storage limit:* For permitted solid waste composting facilities, unprocessed feedstocks shall be removed within 72 hours; any recovered materials shall be removed within 1 year.
- *Compost storage limit:* At least half of compost stored shall be sold/used each year; beginning the third year after facility startup. Any compost remaining on-site more than 3 years shall be disposed or reprocessed so that it can be sold for use or used.
- *Closure:* All materials, residuals, compost and recyclables shall be removed and properly recycled or disposed.

Pathogen & Vector Attraction Reduction

Compost that contains biosolids is regulated under FAC 62-640.

- *Pathogen reduction:* Class A compost shall meet Federal 503 Class A standards for PR; Class B compost shall meet Federal 503 Class B standards for PR.
- *Vector attraction reduction:* Compost shall meet Federal 503 VAR standards.

Compost not containing biosolids is regulated under FAC 62-709 and must comply with standards for disinfection as defined in FAC 62-701: Fecal coliform ≤ 100 most probable number per gram of volatile suspended solids and organic solid waste met process to further reduce pathogen (PFRP) composting standards defined as 55 degree Celsius for 3 days (in-vessel), 15 days and 1 turning (aerated windrow), or 15 days and 4 turnings (unaerated windrow).

Pollutant Standards (62-709.550)

Heavy metal concentration codes are summarized in Table 2.

Table 2 – Heavy Metal Concentration Standards (mg/Kg DW)

<i>Metal</i>	<i>Concentration Codes</i>			
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Cadmium	<15	15 – <30	30 – 100	>100
Copper	<450	450 – <900	900 – 3,000	>3,000
Lead	<500	500 – <1,000	1,000 – 1,500	>1,500
Nickel	<50	50 – <100	100 – 500	>500
Zinc	<900	900 – <1,800	1,800 – 10,000	>10,000

Monitoring, Recordkeeping and Reporting

Facility owners and operators must comply with the following requirements.

- *Material logs:* Quantity and type of waste received, waste processed, compost produced, compost removed from site.
- *Temperature records:* For facilities that handle solid waste, other yard trash or manures, temperature records and length of composting period shall be maintained for at least 3 years.
- *Compost testing results:* Analytical results of compost testing.
- *Annual report:* Facilities that produce compost made from solid waste shall submit an annual report including quantity of materials received, materials processed, compost produced and compost removed.

Compost Testing and Use (62-709.530, 550 & 600)

Fully permitted facilities shall comply with the following testing requirements:

- *Testing frequency:* Every 20,000 tons of compost produced, or every 3 months.
- *Agronomic parameters:* Moisture, macro-nutrients, organic matter and pH.
- *Other parameters:* Foreign matter, fecal coliform, and heavy metals (Cd, Cu, Pb, Ni, Zn). Note that these other parameters are required only for compost produced from other than yard trash or manure.

Florida establishes the following compost classifications based on the type of feedstock, product maturity, foreign matter content, particle size and heavy metal concentrations.

- Type Y: Made from yard trash only; semi-mature or mature, fine, medium or coarse texture; foreign matter <2% assumed; Code 1 heavy metals assumed.

- Type YM: Made from manure or yard trash & manure only; semi-mature or mature, fine, medium or coarse texture; foreign matter <2% assumed; Code 1 heavy metals assumed.
- Type A: Made from solid waste; mature; fine texture; foreign matter <2% and not able to cause injury; Code 1 heavy metals.
- Type B: Made from solid waste; semi-mature or mature; fine or medium texture; foreign matter <4% and not able to cause injury; Code 1 or 2 heavy metals.
- Type C: Made from solid waste; semi-mature or mature; fine, medium or coarse texture; foreign matter <10%; Code 1, 2 or 3 heavy metals.
- Type D: Made from solid waste, or from only yard trash or manure; fresh; fine, medium or coarse texture; foreign matter <10%; Code 1, 2 or 3 heavy metals (foreign matter and metal concentrations assumed for yard trash and manure compost).
- Type E: Made from solid waste with Code 4 heavy metals.

Compost utilization shall conform with the following restrictions:

- *Type Y, YM or A:* Unrestricted distribution and use.
- *Type B or C:* Restricted to commercial, agricultural, institutional or government operations; Type B may be used where public contact is likely.
- *Type D:* Restricted to use at landfills and land reclamation projects; no public contact allowed.
- *Type E:* Must be disposed unless demonstrated that usage will not endanger environment or public.

Compost that contains biosolids shall conform with the following restrictions:

- Class AA:
 - *Parameters:* Class A PR standards; VAR standards; heavy metal concentrations not exceeding limits in Table 4.
 - *Usage:* unrestricted use.
- Class A:
 - *Parameters:* Class A PR standards; heavy metal concentrations and cumulative loading limits shall not exceed limits in Table 3.
 - *Usage:* allowed on unrestricted public access areas.
- Class B:
 - *Parameters:* Class B PR standards; heavy metal concentrations and cumulative loading limits shall not exceed limits in Table 3.
 - *Usage:* limited to restricted public access areas.

NOTE: In March 2005, the DEP issued a memorandum to staff regarding land application of mulch. Products (e.g., mulch or compost) from registered yard trash processing facilities may be used with no restriction. However, mulch is not specifically defined in Florida regulations. And in the wake of the 2004 hurricanes, large quantities of vegetative debris are being processed into mulch and land applied. DEP issued a temporary ruling that until at least the end of 2005 all such mulch may be applied to the land in layers up to 2 feet in depth without requiring DEP review. In January 2006, DEP extended the effective date allowing such application without DEP review until the end of 2006.

Table 3 – Ceiling concentration and cumulative loading limits for composts with biosolids

<i>Metals</i>	<i>Ceiling Concentration (mg/Kg DW)</i>	<i>Cumulative Loading Limit (lbs/acre)</i>
Arsenic	75	36.6
Cadmium	85	34.8
Copper	4,300	1,340
Lead	840	268
Mercury	57	15.2
Molybdenum	75	Not applicable
Nickel	420	375
Selenium	100	89.3
Zinc	7,500	2,500

Table 4 – Ceiling concentration Class AA composts with biosolids

<i>Metals</i>	<i>Ceiling Concentration (mg/Kg DW)</i>
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

Appendix C – Maine

Introduction

Maine has established regulatory categories of facilities based on the types of materials they handle and the size of the operation. The regulatory system was developed with extensive input and review by the organics recycling industry in the state. Maine is unique in how it uses feedstocks' carbon-to-nitrogen (C:N) ratio to categorize facilities. Maine has the following regulatory categories: exempted, permit-by-rule, reduced procedure and full permit facilities. There is a gradual increase in the facility requirements in all the categories. Most of the facilities in the state are permit-by-rule. Not only is it easier for operators to comply with regulations, but also it is easier for the Department to enforce regulations for facilities with fewer requirements.

Maine composting regulations are contained mostly in *Maine Solid Waste Management Rules: Chapter 409 - Processing Facilities*. Definitions related to composting can be found in *Maine Solid Waste Management Rules: Chapter 400 - General Provisions* along with other solid waste definitions. Some information regarding product testing and use and tables with specific contamination standards can be found in *Chapter 419: Agronomic utilization of residuals*. The state regulatory agency is the DEP Bureau of Remediation & Waste Management, in particular the Division of Solid Waste Management, referred to as Department.

Chapter 409 refers to composting facilities as a specific type of processing facilities. Chapter 409 provides details about general licensing requirements, application requirements, operating requirements, and other specific requirements for different types of composting facilities.

Chapter 409 includes the following sections related to composting facilities:

1. Applicability.
2. General Licensing Requirements.
3. Application Requirements (Site design, process design, operations manual, etc.).
4. Operating Requirements.
7. Permit by Rule for Processing Wood Wastes.
8. Permit by Rule Composting of Wood, Leaf and Yard Wastes.
9. Reduced Procedure for Select Compost Facilities.

Appendix A. Carbon To Nitrogen Ratios (C:N)

Definition of Key Terms

The following definitions extracted from Chapter 400.1 illustrate key terms used in Maine's compost regulations.

- “Compost” means a residual that has undergone a composting process.
- “Composting” means the biological decomposition of organic residuals under predominantly aerobic conditions and controlled temperatures between 110° and 150° F.
- “Environmental monitoring” means collecting and analyzing ground and surface water samples, leachate, leak detection and leachate treatment residue samples, air samples, landfill gas samples and/or measurements, waste characterization, and monitoring of solid waste settlement and landfill and/or site stability.
- “Processing facility” means any land area, structure, equipment, machine, device, system, or combination thereof, other than incinerators, that is operated to reduce the volume or change the chemical or physical characteristics of solid waste. Processing facilities include but are not limited to facilities that employ shredding, baling, mechanical and magnetic separation, and composting or other stabilization techniques to reduce or otherwise change the nature of solid waste.
- “Putrescible waste” means solid waste that contains organic matter that can be rapidly decomposed by microorganisms, which may give rise to foul-smelling, offensive products during such decomposition or which is capable of attracting or providing food for birds and potential disease-carrying organisms such as rodents and flies.
- “Residual” means solid wastes generated from municipal, commercial or industrial facilities that may be suitable for agronomic utilization. These materials may include: food, fiber, vegetable and fish processing wastes; dredge materials; sludges; dewatered septage; and ash from wood or sludge-fired boilers.
- “Type IA residual” means a residual from a known source that does not contain hazardous substances above risk-based standards in Appendix 418.A and that has a carbon to nitrogen ratio greater than or equal to 25:1, such as leaf and yard waste, wood chips and some vegetative wastes.

- “Type IB residual” means a residual from a known source that does not contain hazardous substances above risk-based standards in Appendix 418.A and that has a carbon to nitrogen ratio greater than 15:1 but less than 25:1, such as animal manure and most produce and vegetable wastes.
- “Type IC residual” means a residual from a known source that does not contain hazardous substances above risk-based standards in Appendix 418.A and that has a carbon to nitrogen ratio of 15:1 or less, such as fish wastes.
- “Type II residual” means a residual from a known source that does not contain hazardous substances above risk-based standards in Appendix 418.A and that may contain human pathogens, such as sewage sludge, dewatered septage and disposable diapers.
- “Wood wastes” means brush, stumps, lumber, bark, wood chips, shavings, slabs, edgings, slash, sawdust and wood from production rejects, that are not mixed with other solid or liquid waste. For the purposes of this definition, “lumber” is entirely made of wood and is free from metal, plastics and coatings.
- “Yard waste” means grass clippings, leave, and other vegetal matter other than wood wastes and land-clearing debris.

Regulatory Categories of Composting Facilities

- Exempted Facilities (Chapter 409.1.B.5 and 6)
- Permit-by-Rule Facilities
 - Wood Waste Processing Facilities (Chapter 409.7, 409.4)
 - Wood, Leaf and Yard Waste Composting Facilities (Chapter 409.8, 409.4)
- Reduced Procedure Facilities (Chapter 409.9)
- Full Permit Composting Facilities (Chapter 409.2 - 4)

Exempt Facilities (Chapter 409.1.B.5 and 6)

Section 409.1.B.5 and 6 exempts certain facilities from obtaining a solid waste processing facility license under Chapter 400 and 409. Two of these types of facilities are also subject to the Department of Agriculture rules. A facility must meet the following criteria to be exempt:

Feedstock and size restriction:

- Facilities that compost less than 10 cubic yards per month of type IA residuals.
- Facilities that compost less than 5 cubic yards per month of type IB residuals.
- Facilities that compost less than 3 cubic yards per month of type IC residuals.
- Facilities that compost less than 20 cubic yards per month of routine animal mortalities at the site of generation. Department of Agriculture rules in Chapter 211 related to Disease Control of Domestic Animals and Poultry also apply.
- Facilities that compost 10,000 cubic yards or less per year of animal manure. These facilities must comply with the Department of Agriculture's Best Management Practices.

Permit-by-Rule Facilities

Wood Waste Processing Facilities (409.7)

Section 409.7 allows Wood Waste Processing facilities (producing only mulch or fuel) to obtain a permit-by-rule license if they meet all of the following standards contained in this section:

Application Requirements (409.7.C)

In order to obtain a permit-by-rule license, the applicant shall submit to the Department the following information:

- Applicant information
- Application fee
- Description
- Title
- Topographic map
- Flood plain map
- Tax map
- Soil and pad design
- Fire control plan
- Public notice
- Certification

Design and Operating Requirements (409.7.B)

- *Feedstock:* Clean wood only; it may not accept for processing painted wood, treated wood, chipboard, plastic; wood with fasteners, nails, paint or coatings; or wood that is otherwise contaminated.
- *Handling area:* It may not exceed 3 acres.
- *On-site storage:* It may not exceed 1 acre, with individual storage piles not exceeding 10,000 square feet.
- *Siting:* It may not lie in a 100-year flood plain and it may not be located within 100 feet of a protected natural resource, such as a coastal wetland or freshwater wetland.
- *Separation distances:* At least 100-foot setback from the waste handling area to property boundaries.
- *Separation distances:* At least 500-foot setback from the waste handling area to all water supply springs, water supply wells, and all residences not owned by the facility operator or owner.
- *Processing and Storage Pad:* At least 2 feet above groundwater and made of either
 - 2 feet of glacial till (having between 15 and 35% fines) with a 6 foot drainage layer of gravel, or
 - Soil covered with asphalt or concrete.
- *Soil for processing and storage:*
 - Moderately well drained to well drained, with at least 24 inches to the groundwater/bedrock, or
 - Soil certified as appropriate by a soil scientist, soil engineer or other qualified individual, or
 - Land area under a permanent, roofed structure.
- *Drainage:* Surface water drainage shall be away from processing and storage.
- *Inspection:* The operator must inspect all incoming materials.
- *Fire Control:* Plan to implement spontaneous combustion in wood waste and wood chip piles.
- *Closure:* The applicant must remove all wastes and wood chips from the facility and broom clean the facility structures and equipment. It shall cause no contamination at all.

Reporting (409.7.B)

- *Annual Report:* It must contain the estimated weight or volume of wood waste received, the estimated weight or volume of wood waste distributed, the estimated weight or volume of wood waste stored on-site, and a description of problems encountered.

Product Distribution & Use (409.7.B)

- *Distribution:* It must be distributed for use or disposal within 2 years of receipt at the facility.

Wood, Leaf and Yard Waste Composting Facilities (409.8)

Section 409.8 allows Wood, Leaf and Yard Waste Composting Facilities (handling only Type IA residuals) to obtain a permit-by-rule license if they meet all of the following standards contained in this section:

Application Requirements (409.8.C)

The applicant shall submit to the Department the following information:

- Applicant information
- Application fee
- Description
- Title
- Topographic map
- Flood plain map
- Tax map
- Soil and pad design
- Fire control plan
- Public notice
- Certification

Design and Operating Requirements (409.8.B)

- *Feedstock:* It may not accept for processing painted wood, treated wood, chipboard, plastic; wood with fasteners, nails, paint or coatings; or wood that is otherwise contaminated.
- *Handling area:* It may not exceed 3 acres.
- *On-site storage:* It may not exceed 1 acre, with individual storage piles not exceeding 10,000 square feet.

- *Separation distances:* Proposed storage, processing, composting and curing may not lie within
 - 500 feet of any water supply spring;
 - 500 feet of any water supply well, or any residence, unless owned by the site operator or owner;
 - 100 feet of any protected natural resource;
 - 100 feet of any property boundary;
 - 100 feet of the solid waste boundary of an active, inactive, or closed solid waste landfill
 - a 100-year flood plain; or
 - In, on or over a protected natural resource without further permitting.
- *Processing and Storage Pad:* at least 2 feet above groundwater and made of either
 - 2 feet of glacial till (having between 15 and 35% fines) with a 6 foot drainage layer of gravel, or
 - Soil covered with asphalt or concrete.
- *Soil for processing and storage:*
 - Moderately well drained to well drained, with at least 24 inches to the groundwater/bedrock, or
 - Soil certified as appropriate by a soil scientist, soil engineer or other qualified individual, or
 - Land area under a permanent, roofed structure.
- *Drainage:* Surface water drainage shall be away from processing and storage.
- *Windrow construction:* Compost windrows must be constructed on a pad or surface with a maximum slope of 6%.
- *Ponding:* The working surface for windrows must be constructed to prevent ponding.
- *Inspection:* The operator must inspect all incoming materials.
- *Windrow formation:* Incoming Type IA residuals must, within a week, be formed into windrow piles that are 10 feet high by 15 to 20 feet wide at the base, or that otherwise provide proper aerobic composting conditions. Windrows must run with the slope of the pad such that runoff is not trapped by the windrows.
- *Grass mixture:* Grass clippings must immediately be incorporated, and thoroughly mixed into established windrows at a ratio of no more than one part grass to three parts Type IA residuals (1 grass: 3 carbonaceous material) by volume. The composting facility must not accept grass clippings unless there is a sufficient volume of Type IA residuals on hand to meet this ratio. Unamended grass may not be stockpiled for any length of time at the site.
- *Windrow turning:* The windrow must be turned at least four times per year. There must be no more than 6 months between any two turnings.]

- *Fire control:* Plan to prevent spontaneous combustion in residual and compost piles at the site.
- *Closure:* The applicant must remove all wastes and compost from the facility, and broom clean the facility structures and equipment. It shall cause no contamination at all.

Reporting (409.8.B)

- *Annual Report:* It must contain the estimated weight or volume of wood waste received, the estimated weight or volume of compost distributed, the estimated weight or volume of compost stored on-site, and a description of problems encountered.

Product Distribution & Use (409.8.B)

- *Distribution:* Compost must be distributed for use within one year of completion of the compost process, and within three (3) years of receipt of the raw materials for composting.

Reduced Procedure Facilities (409.9)

Compost facilities that meet the following feedstock restrictions are eligible to follow reduced application procedures in accordance with Section 409.9. These facilities must comply with the same requirements for siting, design and operations as full permit facilities.

- *Feedstock restriction:*
 - Any amount of Type IA residuals (C:N ratio greater than 25:1, such as yard waste, wood chips and some vegetative wastes,); and/or
 - Up to 400 yds³ monthly of Type IB residuals (C:N ratio between 25:1 and 15:1, such as animal manure and most produce and vegetable wastes); and/or
 - Up to 200 yds³ monthly of Type IC residuals (C:N less than 15:1, such as fish wastes), or up to 200 yds³ monthly of Type II residuals (biosolids).

Application Requirements (409.7.D)

- *Outdoor composting facilities:* report that shows either
 - The soils are moderately well drained to well drained and are at least 24 inches above the water table, bedrock, and sand or gravel deposits; or

- The limitations of the soil characteristics will be overcome and describes the techniques to achieve this, as identified in the soil survey.

Design and Operating Requirements (409.9.B, 409.9.C)

- *Composting pad:* Mixing, composting, curing, storing or otherwise handling residuals, and also compost at the facility, must be on surfaces meeting one of the following standards:
 - On soils that a Maine certified soil scientist has determined are moderately well drained to well drained and that are at least 24 inches above the water table, bedrock, and sand or gravel deposits.
 - On a pad that is constructed a minimum of 2 feet above the seasonal high water table and is composed of one of the following:
 - a minimum of 18 inches of soil material having between 15 and 35% fines, covered with a minimal 6-inch drainage layer of compacted gravel; or
 - soil covered with asphalt or concrete; or
 - other surface as approved by the Department.
- *Composting Pad for Special Materials:* At facilities handling materials with a C:N less than 15, the applicant must construct a receiving and mixing pad covered with asphalt, concrete or other impervious material. For facilities processing sludge, or more than 750 cubic yards of materials with a C:N less than 15 annually, the applicant must construct a pad covered with asphalt, concrete or other impervious material for the entire waste handling area.
- *Storm Water:* Surface water drainage must be diverted away from receiving, processing, composting, curing and storage areas. Water falling on the facility during a storm of an intensity up to a 25-year, 24-hour storm event must infiltrate or be detained.
- *Leachate Control:* The facility also must be designed to manage run-off and leachate to prevent contamination of groundwater or surface water. The facility design must include provisions to contain, collect and treat any leachate generated at the facility.
- *Slopes:* Surfaces on which composting takes place must slope between 2% and 6% and, where necessary, be graded to prevent ponding of water.
- *Composting Pad Inspection:* All soil surfaces that are used for residuals mixing and composting must annually be graded clean and re-compacted. All concrete and asphalt pads must annually be scraped clean and inspected for cracks or other deformities, and repaired as needed.

- *Odor Control:* To prevent nuisance odors at occupied buildings, the following must be done:
 - Receive incoming putrescible residuals on a pile of sawdust or other sorbent, high carbon compost amendment.
 - Contain and treat process air or cover odorous piles with a layer of finished compost or other suitable compost amendment.
 - Properly aerate piles such that composting is aerobic throughout the pile.
 - Blend materials to achieve a homogenous mix throughout the pile,.
 - Alter the compost recipe as needed to alleviate odorous emissions.
- *Static Pile composting:* The following additional standards apply to composting Type IC or Type II residuals using the static pile method:
 - The static piles must be aerated during the active composting stage.
 - Detention time in the static aerated pile must be at least 21 days.
 - Unless an auger, tub grinder hammer mill or other Departmentally approved mixer is used to mix the initial ingredients for the pile, the pile must be broken down half way through the active compost process and reformed.
 - The pile must be maintained with an insulating blanket of at least 12 inches of finished compost, sawdust or other material as approved by the Department during the active compost phase to maintain temperatures throughout the pile and control odors.
- *Stability:* Residuals that have completed the active composting phase also must be cured until the equivalent of a dewar's stability class of IV or greater is achieved.
- *Operations log:* It must be available for Department review during normal business hours.

Pathogen and Vector Attraction Reduction (409.9.C)

Type IC and Type II residuals (biosolids) must be composted to achieve a Class A Pathogen Reduction and Class A Vector Attraction Reduction in accordance with Chapter 419. To attain these standards by composting, all of the following standards must be met:

- *Pathogen Reduction:* Through the process of composting, the temperature of the residual is maintained at 55 degrees Celsius or higher for three consecutive days. For windrow systems, this standard is presumed to be met if the residual is maintained at operating conditions of 55 degrees Celsius or higher for 15 days or longer, and if, during this period, there is a minimum of five turnings of the compost pile.

- *Vector Attraction Reduction:* Residual must be treated by an aerobic composting process for 14 days or longer. During that time, the temperature of the residual must be higher than 40 degrees Celsius and the average temperature of the residual must be higher than 45 degrees Celsius.
- *Analytical Standard:* The density of *Salmonella sp.* bacteria in the finished compost must be less than three Most Probable Number per four grams of total solids (dry weight basis). In the absence of analytical data on *Salmonella sp.*, this standard is presumed to have been met when the density of fecal coliform in the finished compost is shown to be less than 1,000 Most Probable Number per gram of total solids (dry weight basis). This analytical standard must be met at the time the compost is utilized.

Pollutant Standards

In the initial application for a Reduced Procedure Facility Permit, results of a metal and semi-volatile organic compounds test must be included. The Department decides whether the facility applies for a Reduced Procedure Facility or a Full Permit. Once the Reduced Procedure Facility Permit is obtained, there is no testing required for pollutants. If a contamination problem occurs, the Department might consider asking the facility to apply for a Full Permit.

Reporting

- Annual Report: include a list of facilities to where the material is distributed.

Product Distribution & Use

- Class A compost has unrestricted use and Class B compost can only be land applied following the specifications of Chapter 419.
- Facilities permitted through a Reduced Procedure or a General Procedure must provide a BMP (Best Management Practices) Manual to consumers, in which information on how to use the compost is included.

Full Permit Facilities

Application Requirements (409.3)

- *Facility Description (409.3.A)*: Brief description, topographic map, aquifer map, tax map and flood plain map.
- *Engineering Design (409.3.B)*: The following components must be included:
 - *Site Plan*: A detailed plan of the area within 500 feet of the waste handling area. Facilities that have an outdoor handling of putrescible wastes must include the direction and distance of airports within 10,000 feet of the waste handling area.
 - *Plan Views of the Structures and Utilities*: A large-scale construction plan view drawing.
- *Process Design (409.3.C)*: A general description of the facility's waste processing system, including process flow diagram, product standards, composting method, windrow construction, curing, storage, mixing, screening, aeration equipment, carbon to nitrogen ratio, moisture content throughout the process, bulk density throughout the pile, volatile solids content, pH, aeration frequency and sub processes duration.
- *Residual and Secondary Material Distribution Plan (409.3.D)*: A description of the disposition of materials generated at the facility, not covered under beneficial use or agronomic utilization. If residuals are proposed for agronomic utilization, submit the application information required under Chapter 419. If secondary materials are proposed for beneficial uses, submit the application information required under Chapter 418.
- *Operations Manual (409.3.E)*: It should contain all the information required in Section 409.4.
- *Environmental Monitoring Plan (409.3.F)*: Including a waste characterization analytical work plan, if required by the Department.
- *Odor Control Plan (409.3.G)*: The applicant must demonstrate that the facility will not cause an odor nuisance.
- *Subsurface Investigation (409.3.H)*: Submit information to demonstrate that the facility design is compatible with the site's soil characteristics, as determined by applicable engineering standards of practice.

Design and Operating Requirements (409.2, 409.4)

- *Siting standards (409.2.A)*
 - *Distance to solid waste landfill*: Not closer than 100 feet to the solid waste boundary, whether it is active, inactive or closed.

- *Flood plain:* Not located within a 100 year flood plain or restrict the flow of a 100 year flood.
- *Protected natural resource:* Not located in, on or within 100 feet of it. A permit is required if the facility is located on land adjacent to the following areas: a coastal wetland, great pond, river, stream or brook, or significant wildlife habitat contained within a freshwater wetland, and other freshwater wetlands.
- *Water supply wells or springs:* Not closer than 300 feet from those located off-site.
- *Property boundaries:* Not closer than 100 feet to public roads and property boundaries.
- *Distance to airports:* Not closer than 10,000 feet to any airport runway used by turbojet aircraft, or within 5,000 feet of any airport runway used by only piston-type aircraft, when putrescible waste is to be handled outdoors in an uncovered or exposed condition.
- *General design standards (409.2.B)*
 - *Product Quality:* The facility process must be designed to produce a product meeting the specifications needed to distribute the product. When the facility's purpose is to produce a residual or secondary material for beneficial use in Maine, that residual or secondary material must meet the applicable standards in Chapter 418 or Chapter 419.
 - *Design Capacity:* The facility design must include processing systems and storage areas of sufficient capacity to accommodate seasonal throughput of all materials that are delivered to and generated by the facility.
 - *Environmental Monitoring Program Design:* If the facility poses a potential threat to public health or safety or the environment, it must have a monitoring program designed and implemented in accordance with the applicable requirements of Chapter 405.
 - *Leachate Control:* The facility design must include provisions to contain, collect and treat any leachate and wash waters generated at the facility.
 - *Clean-up:* The facility design must include provisions for the regular wash-down or dry clean-up of the facility.
 - *Facility Access:* It must include suitable barriers or fencing and gates to prevent unauthorized persons access to the site.
- *Operations manual (409.4.A):* The manual must address all operating requirements contained in Section 409.4. The manual also must include a copy of the facility license, any amendments and revisions to that license, and a copy of the applicable sections of the most recent Solid Waste Management Regulations.

- *General operating requirements (409.4.B)*
 - *Personnel:* The operation of the processing facility must be under the overall supervision and direction of a person qualified and experienced in the operation of that type of facility, or, in the case of an innovative design, be adequately trained by responsible personnel in the operation of the facility.
 - *Equipment:* Equipment must be sufficient to meet the requirements, and the operator must provide for the routine maintenance of equipment.
 - *Environmental Monitoring:* The operator must implement the approved environmental monitoring program, including any required waste characterization.
 - *Fire Protection:* The facility shall develop and implement a plan to prevent spontaneous combustion in wood waste, residual and compost piles, as applicable. The operator shall develop a fire and rescue plan in conjunction with the local fire department to prevent and control fires at the processing facility.
 - *Vector Control:* The on-site population of disease vectors must be minimized to protect public health.
 - *Dust Control:* The operator must control dust generated by the facility.
 - *Storage:* Raw materials, wastes and secondary materials, including processed residuals, must be stored on the site such that they remain suitable for the intended use. Materials with a carbon to nitrogen ratio (C:N) of less than 20:1 or that may contain constituents that may leach into groundwater may not be stored on in situ soils. Wastes and secondary materials may not be stored at the site for more than 2 years.
 - *Litter Control:* The operator must provide for routine maintenance and general cleanliness of the entire facility site, including control of windblown litter.
 - *Leachate Control:* A compost facility must contain, collect and treat leachate and runoff mixed with leachate.
 - *Erosion control:* The facility must control sedimentation and erosion during construction and operation of the facility.
- *Facility access (409.4.C):* The operator must prevent unauthorized persons access to the site. The facility gate may be unlocked or open only when an authorized person is on duty. Access roads shall be maintained and appropriate signs shall be posted, including a sign with the hours of operation.
- *Acceptance and distribution of waste (409.4.D)*
 - *Inspection:* Incoming wastes must undergo a visual inspection and, if appropriate, analysis to ensure that only wastes allowed by the facility license are

accepted at the facility. All other wastes must be removed and handled at an approved facility.

- *Hazardous waste*: If a compost facility accepts other wastes not specified on the license, it must implement a Hazardous and Special Waste Handling and Exclusion Plan developed in accordance with Chapter 400, Section 9.
- *Secondary materials*: Secondary materials, including processed residuals, must be distributed in accordance with the provisions of Chapter 418 or Chapter 419, or other applicable standards of these rules.
- *Waste Disposal*: The operator must have procedures in place, prior to the start of operation, for disposal of bypass and other solid waste generated by the processing facility, including contingency procedures for implementation during emergencies and shutdown periods. The operator must also maintain a valid contract with a solid waste facility that has Department approval to accept the waste.
- *Odor control (409.4.E)*: The facility must be operated to prevent nuisance odors at occupied buildings, and shall report odor complaints received by the facility to the Department.
- *Facility closure (409.4.I)*: The facility must be closed in a manner that minimizes the need for further maintenance; and so that the closed facility will not cause any contamination to the environment or create a nuisance. At a minimum, the applicant must remove all wastes and secondary materials from the facility, and broom clean the facility structures and equipment. It shall submit a closure plan to the Department before it closes.

Pathogen & Vector Attraction Reduction (409.9.C)

Type IC and Type II residuals (biosolids) must be composted to achieve a Class A Pathogen Reduction and Class A Vector Attraction Reduction in accordance with Chapter 419. To attain these standards by composting, all of the following standards must be met:

- *Pathogen Reduction*: Through the process of composting, the temperature of the residual is maintained at 55 degrees Celsius or higher for three consecutive days. For windrow systems, this standard is presumed to be met if the residual is maintained at operating conditions of 55 degrees Celsius or higher for 15 days or longer, and during this period, there is a minimum of five turnings of the compost pile.
- *Vector Attraction Reduction*: Residual must be treated by an aerobic composting process for 14 days or longer. During that time, the temperature of the residual must be higher

than 40 degrees Celsius and the average temperature of the residual must be higher than 45 degrees Celsius.

- *Analytical Standard:* The density of *Salmonella sp.* bacteria in the finished compost must be less than three Most Probable Number per four grams of total solids (dry weight basis). In the absence of analytical data on *Salmonella sp.* this standard is presumed to have been met when the density of fecal coliform in the finished compost is shown to be less than 1,000 Most Probable Number per gram of total solids (dry weight basis). This analytical standard must be met at the time the compost is utilized.

Pollutant Standards

- For compost derived from biosolids, see the following Table 1.

Table 1 – Heavy metal standards for sewage sludge utilization (dry weight)

<i>Heavy Metal</i>	<i>Column A</i> <i>Screening conc. in sewage sludge (mg/kg)</i>	<i>Column B</i> <i>Ceiling conc. in sewage sludge (mg/kg)</i>	<i>Column C</i> <i>Annual Pollutant Loading Rate at utilization site (kg/ha)</i>	<i>Column D</i> <i>Cumulative Pollutant Loading Rate at utilization site (kg/ha)</i>	<i>Column E</i> <i>Ceiling conc. in soil at utilization site (mg/kg)</i>
Aluminum	N/A	N/A			100,000
Arsenic	10	41	0.5	10	73
Barium	N/A	N/A			1,500
Beryllium	N/A	N/A			7
Cadmium	10	39	1.9	39	39
Chromium	1,000	3,000			3,000
Cobalt	N/A	N/A			70
Copper	1,000	1,500	75	1,500	1,500
Lead	300	300	15	300	300
Mercury	6	10	0.3	6	6
Molybdenum	75	75			15
Nickel	200	420	20	420	420
Selenium	100	100	5	100	100
Silver	N/A	N/A			34
Vanadium	N/A	N/A			300
Zinc	2,000	2,800	140	2,800	2,800

- For compost derived from Type III residual other than biosolids see Table 2

Table 2 – Screening concentrations and utilization sites for other residuals (mg/kg dry weight)

<i>Inorganic Compound</i>	<i>Column A</i>	<i>Column B</i>
	<i>Screening Concentration for other residuals</i>	<i>Ceiling Concentration in soil at Utilization sites</i>
Aluminum	97,500	100,000
Antimony	5	5
Arsenic	5	73
Barium	2,000	2,000
Beryllium	2	7
Cadmium	8	8
Chromium	38	38
Cobalt	5,875	5,875
Copper	1,500	1,500
Cyanide	10	10
Lead	375	375
Mercury	1	1
Molybdenum	488	488
Nickel	130	130
Selenium	5	5
Silver	34	34
Thallium	1	1
Vanadium	688	688
Zinc	2,800	2,800

Monitoring, Recordkeeping, and Reporting

- *Recordkeeping (409.4.F):* The facility operator must keep the following records: as-built engineering drawings, analytical data results, operations manual, copies of periodic and annual reports, and a stabilization facility operations log.
- *Periodic reports (409.4.G):* Results of environmental monitoring, including waste characterization, and any other information required in accordance with the facility license.
- *Annual report (409.4.H):* It must include a detailed summary of activities at the processing facility during the past year.

Compost Testing and Use (419.8.B)

Compost Testing and Use requirements from Section 419.8.B apply only to compost produced in full permitted composting facilities or compost coming in from other states.

- *Product testing:* Heavy metals limits, hazardous substance limits, sharps and synthetics, stability, salts
- *Heavy Metal Standards:*
 - *Sewage sludge or dewater sludge compost:* Concentrations of metals in the compost must be less than the concentrations in Table 419.3, Column A.
 - *Type III residual compost:* Concentrations of metals in the compost must be less than the concentrations in Table 419.5, Column A.
- *Hazardous substances:* For compost made from Type III residuals (residential non-source-separated residuals), concentrations of hazardous substances other than heavy metals in the compost are less than the screening standards in Chapter 418, Appendix A.
- *Sharps and synthetic objects:* The residual contains less than 0.05%, by weight, of synthetic objects, and contains less than one sharp object – such as broken glass, nails or needles – per 10 tons of residual based on visual inspection.
- *Compost stability:* The stability class of the compost must be measured and the generator must distribute information to compost users on the appropriate uses of the compost, based in part on the compost's stability.
- *Salt content:* For compost with a salt content greater than 2 mmhos/cm, the generator must distribute information to compost users on the appropriate uses of the compost based in part on the salt content of the material.

Appendix D – Massachusetts

Introduction

Massachusetts has utilized a combined approach of regulatory categories and proactive programs to promote and assist development of the organics recycling industry. The state DEP has separate divisions for regulatory enforcement versus waste prevention. The state has placed a great deal of emphasis on commercial food waste diversion and established regulatory categories and outreach and development programs to support it. A composting operation can operate either under a conditional exemption, a determination of need (DON), a research or demonstration project, or a full permit. The conditional exemptions for on-farm composting and yard waste composting have exempted the vast majority of composting operations from full-scale permitting regulation. The combination of exemptions and DON with demonstration projects has been very successful at expanding organics recycling, especially municipal yard waste composting and on-farm composting of commercial organics.

Massachusetts composting regulations are contained in *310 Code of Massachusetts Regulations (CMR) 16.00: Site Assignment Regulations for Solid Waste Facilities* and *310 CMR 19.00: Solid Waste Management*. Regulations for compost use are contained in *310 CMR 32.00: Land Application of Sludge and Septage*. The state regulatory agency is the Massachusetts Department of Environmental Protection (MDEP).

Massachusetts' site assignment regulation (Chapter 16.00) establishes a procedure whereby the MDEP and a local Board of Health must first determine that a site is suitable for a proposed solid waste activity. Chapter 16.00 identifies organics recycling facilities that are exempt from the site assignment process and thus exempt from Chapter 19.00 solid waste facility permitting requirements. Facilities that require a full permit must comply with the site assignment requirements in Chapter 16.00 and then obtain a permit in conformance with 310 CMR 19.00.

For the purposes of this profile, the following sections of Chapter 16.00 are relevant:

- Section 16.02: Definitions
- Section 16.05: Applicability
- Section 16.40: Site Suitability Criteria

For the purposes of this profile, the following sections of Chapter 19.00 are relevant:

- Section 19.006: Definitions
- Section 19.030: Application for a Solid Waste Management Facility Permit
- Section 19.038: Criteria for Review of Applications
- Section 19.041: Authorization to Construct
- Section 19.042: Authorization to Operate
- Section 19.043: Conditions for Permits and Authorizations

The remainder of Chapters 16.00 and 19.00 deal with procedures for submittal, review, approval, appeal fees, enforcement, penalties, etc.

Key Terms

- “Agricultural Waste” means discarded organic materials produced from the raising of plants and animals as part of agronomic, horticultural or silvicultural operations, including, but not limited to, animal manure, bedding materials, plant stalks, leaves, and other vegetative matter and discarded by-products from the on-farm processing of fruits and vegetables.
- “Compostable Material” means an organic material, excluding waste water treatment residuals, that has the potential to be composted, is pre-sorted and not contaminated by significant amounts of toxic substances.
- “Composting” means a process of accelerated biodegradation and stabilization of organic material under controlled conditions, yielding a product that can safely be used.
- “Food Material” means source-separated material produced from human food preparation and consumption activities at homes, restaurants, cafeteria, or dining halls, and that consists of fruits, vegetables and grains, fish and animal products and byproducts, and soiled paper unsuitable for recycling.
- “Pre-Sort” means to segregate a material for reuse, recycling or composting by preventing the material from being commingled with solid waste at the point of generation, or to separate and recover the material from solid waste at a processing facility. Pre-sorting does not require the recovery or separation of non-recyclable components that are integral to a recyclable product (e.g. insulation or electronic components in white goods).

- “Vegetative Material” means source-separated material which consists solely of vegetative waste such as fruits, vegetables and grains, that is produced from food preparation activities at, but not limited to, grocery stores; fruit or vegetable canning, freezing or preserving operations, and food or beverage processing establishments.
- “Wood Waste” means discarded material consisting of trees, stumps and brush, including but not limited to sawdust, chips, shavings and bark. Wood waste does not include new or used lumber or wood from construction and demolition waste, and does not include wood pieces or particles containing or likely to contain asbestos, or chemical preservatives such as creosote or pentachlorophenol, or paints, stains or other coatings.
- “Yard Waste” means deciduous and coniferous seasonal deposition (*e.g.*, leaves), grass clippings, weeds, hedge clippings, garden materials and brush.

Regulatory Categories of Organics Recycling Facilities

Massachusetts has the following categories of organics recycling facilities:

- Conditionally exempt facilities
- Determination of need (DON) facilities
- Research & demonstration projects
- Full permit facilities

The definitions and regulatory requirements for each category are summarized in the sections that follow.

Conditionally Exempt Facilities 16.05(4)

Section 16.05(4) defines the types of facilities and operations that are exempt from site assignment regulations, provided they incorporate good management practice, prevent unpermitted discharge of pollutants, and do not cause a public nuisance.

Backyard Composting 16.05(4)(a)

Backyard composting is defined as the composting of organic solid waste – such as grass clippings, leaves or brush – generated by a homeowner or tenant of a single or multi-family

residential unit or an apartment complex unit, where composting occurs at that dwelling place. All types of backyard composting are exempt.

Yard Waste Composting 16.05(4)(b)

Yard waste composting facilities are exempt from site assignment and permitting provided they meet the following requirements.

- *Feedstock restriction:* Clean leaves and yard waste with less than 25% grass clippings by volume.
- *Size restriction:* <50,000 cubic yards or <10,000 tons on-site at any one time.
- *Size restriction:* <5,000 cubic yards per acre of materials.
- *Site registration:* The facility must be registered with MDEP or located within the property boundaries of the site where all the leaf and yard waste is generated.
- *Registration requirements:* Submittal to the MDEP must include:
 - *Contact information:* For the owner and operator.
 - *Site plan:* Indicating distance to public water supplies, interim wellhead protection area, aquifer contribution area, and residences using private wells within ½ mile of the site.
 - *Facility description:* Type and quantity of composting.

Agricultural Waste Composting 16.05(4)(c)

Composting operations located on a farm engaged in “agriculture” or “farming” as defined in Massachusetts General Law are exempt from site assignment and permitting provided they meet the following requirements.

- *Acceptable feedstocks:* Any type of agricultural waste is acceptable. The following compostable materials from off-site are acceptable:
 - Leaf and yard waste.
 - Wood waste.
 - Clean newspaper or cardboard.
 - Clean compostable (*i.e.* thin) shells and clean bones.
 - Non-agricultural sources of manures and animal bedding materials.
 - <20 cubic yards or <10 tons per day of vegetative material.
 - <10 cubic yards or <5 tons per day of food material.
- *Site registration:* The facility must be registered with MDEP.

- *Registration requirements:* Submittal to the MDEP must include:
 - Contact information: for the owner and operator.
 - Site plan: indicating distance to public water supplies, interim wellhead protection area, aquifer contribution area, and residences using private wells within ½ mile of the site.
 - Facility description: type and quantity of composting.

Institutional, Commercial, Industrial & Zoo Composting (16.05(4)(d))

Composting operations located at an institutional, commercial or industrial site or zoo are exempt from site assignment and permitting provided they meet the following requirements.

- *Feedstock restriction:* Only vegetative materials, food materials or animal manures that are generated on-site may be handled.
- *Size restriction:* <4 cubic yards or <2 tons per week is composted.
- *Notification:* The facility must notify MDEP and the local board of health at least 30 days prior to commencing operations.

Determination of Need (DON) Facilities 16.05(6) & (7)

Composting facilities may apply to the MDEP for a determination whether a site assignment is needed. These facilities are subject to site assignment and permitting requirements unless the MDEP determines that a site assignment is not required. Agricultural composting operations not already conditionally exempt may apply for a DON. Other facilities must meet the following requirements to apply for a DON:

Feedstock and Size Restrictions 16.05(6)

- *Leaves and yard waste:* >50,000 cubic yards or >10,000 tons on-site at any time, and <5,000 cubic yards per acre of materials.
- *Vegetative material:* <40 cubic yards or <20 tons.
- *Food material:* <20 cubic yards or <10 tons.

Application Requirements 16.05(7)

- *Feedstock characterization:* Description of sources, quantities and quality of materials, including chemical and/or physical characterization if required by MDEP.

- *Process description:* The proposed method of composting.
- *Product description:* The products to be made or uses to which materials will be put, and documentation that markets exist for the compost.
- *Location and site map:* Depicting the general location of the facility, zoning classification of the site and adjacent areas, and location of wetlands on and adjacent to the site.
- *Site and design plans:* Location and size of storage areas; facility layout including equipment, building, roads, stormwater controls, etc.
- *Collection methods:* Description of methods for pre-sorting compostable materials prior to delivery to the facility.
- *Processing equipment:* Description of all processing equipment.
- *Wastewater management:* Quantity and quality of any wastewater, and discharge method.
- *Residue management:* Quantity and quality of residue, and disposal method.

Evaluation Criteria 16.05(7)

- *Compostable feedstocks:* Materials meet the definition of compostable materials.
- *Source-separation requirement:* Materials are pre-sorted.
- *Maximum residue:* The quantity of residue including rejects does not average more than 5%.
- *Nuisance prevention:* Facility will not cause a nuisance condition.
- *Public health & environment protection:* Facility will ensure protection of public health and safety and the environment.

Research & Demonstration Projects 16.05(10)

Composting projects may be approved by the MDEP to demonstrate innovative composting techniques and may be exempted from site assignment and permitting requirements if they meet the following conditions:

Feedstock and Size Restrictions 16.05(10)(a)

- *Feedstock and size restriction:* Pre-sorted compostable materials that are permitted at conditionally exempt facilities.
- *Time restriction:* Not to exceed one year.

Application Requirements 16.05(10)(b)

An application must be submitted to the MDEP, the local Board of Health and, in the case of agricultural composting, to the Department of Food and Agriculture. Application requirements include the following.

- *Feedstock characterization:* Description of sources, quantities and quality of materials, including chemical and/or physical characterization if required by MDEP.
- *Process description:* The proposed method of composting.
- *Product description:* The products to be made or uses to which materials will be put, and documentation that markets exist for the compost.
- *Location and site map:* Depicting the general location of the facility, zoning classification of the site and adjacent areas, and location of wetlands on and adjacent to the site.
- *Site and design plans:* Location and size of storage areas, facility layout including equipment, building, roads, stormwater controls, etc.
- *Collection methods:* Description of methods for pre-sorting compostable materials prior to delivery to the facility.
- *Processing equipment:* Description of all processing equipment.
- *Wastewater management:* Quantity and quality of any wastewater, and discharge method.
- *Residue management:* Quantity and quality of residue, and disposal method.

Evaluation Criteria 16.05(10)(c)

- *Adverse impacts:* Potential for adverse impacts.
- *Research value:* Likelihood of obtaining new and useful information.
- *Product use:* Ability of the applicant to properly use or dispose of all materials.

Full Permit Facilities

The following types of composting facilities are subject to Massachusetts site assignment and solid waste permitting requirements:

- Facilities that accept >40 cubic yards or >20 tons per day of vegetative materials.
- Facilities that accept >40 cubic yards or >10 tons per day food materials.
- Facilities that accept residential source-separated organic materials.

- Facilities that accept biosolids and combine it with mixed solid waste or food materials or vegetative materials.
- Facilities that accept any amount of mixed solid waste.
- Other facilities as determined by MDEP via DON or noncompliance with conditional exemption criteria.

These facilities must obtain a site assignment in accordance with 310 CMR 16.00 and then permits to construct and operate in accordance with 310 CMR 19.00. The following paragraphs provide a general summary of the regulatory requirements.

Site Assignment Requirements

Siting Requirements for All Solid Waste Facilities (16.40(4))

- *Agricultural lands protection:* Sites on, or within 100 feet of, active agricultural land or prime, unique or locally important agricultural land are not suitable.
- *Traffic and site access:* Sites where traffic impacts would endanger public health, safety or the environment are not suitable.
- *Wildlife and wildlife habitat:* Sites that would have an adverse impact on endangered, threatened, or special-concern species are not suitable.
- *Areas of critical environmental concern:* Sites within an area of critical environmental concern are not suitable.
- *Open space protection:* Sites that would have an adverse impact on state forests, parkland and conservation lands are not suitable.
- *Air quality protection:* Sites where anticipated emissions would endanger public health, safety or the environment are not suitable.
- *Nuisances potential:* Sites that would result in a nuisance (noise, litter, vermin, odors, etc.) are not suitable.
- *Size of facility:* Sites without >100 feet buffer between waste handling areas and the property line are not suitable.
- *Old disposal sites:* When located next to an old disposal site, the impact of both sites on each and on public health, safety and the environment shall be considered.
- *Existing solid waste facilities:* For regional facilities, preferential consideration will be given to sites in municipalities with no existing landfill or combustion facility.
- *Existing sources of pollution/contamination:* Impacts of existing sources of pollution or contamination shall be considered.

- *Regional participation:* For regional facilities, preferential consideration will be given to sites in municipalities not already participating in a regional disposal facility.

Additional Siting Requirements for Composting Facilities (16.40(3))

- *Water supply protection:* Waste handling areas within the following areas are prohibited:
 - Specified distances of a public water supply (determined by well capacity)
 - The wellhead protection area or the zone of contribution of an existing public water supply well
 - Specified distances of any surface drinking water supply
 - Specified distances of an existing or potential private drinking water supply
- *Adjacent land use protection:* Waste handling areas are prohibited within 500 feet of occupied residential dwellings, prisons, health care facilities, schools, etc.
- *Flood protection:* Waste handling areas are prohibited in the riverfront area as defined in state regulations.
- *Groundwater protection:* Depth to maximum high groundwater levels must be >2 feet.

Solid Waste Permitting Requirements

All composting facilities not otherwise exempted must obtain a solid waste permit, and authorization to construct, and an authorization to operate from MDEP. The following paragraphs summarize the requirements for obtaining the permit and authorizations.

Application Requirements

An application for a new solid waste facility permit must include:

- *Contact information:* Name and address of owner and operator.
- *Facility plan:* including the following:
 - Site plan: including maps, diagrams, reports and other information required by MDEP.
 - Facility design plan: including diagrams, reports, studies and other information required by MDEP.
 - Waste characterization.
 - Design description: detailed description of facility design.

- Operations & maintenance plan: detailed description including waste handling techniques, maintenance procedures, environmental monitoring protocols, compliance with disposal bans, and compliance and inspection plan.
- Closure/post-closure plan.
- *Public health report*: If required by Department of Public Health.
- *Compliance with site assignment*: Proof that the proposed facility is located within the boundaries of the valid site assignment.
- *Compliance with MEPA*: Demonstration that Massachusetts Environmental Protection Act process (EIAMEPA??) does not apply or has been completed.

Design and Operating Requirements

- Set back buffers: Unless a waiver is provided by MDEP, waste handling areas cannot be located within:
 - 100 feet of property boundary.
 - 250 feet of an existing or potential private water supply well.
 - 250 feet of an occupied residential dwelling, prison, health care facility, or school.
 - A wetland protection area.
 - 500 feet upgradient or 250 feet downgradient of a surface drinking water supply.
- Authorization to construct: This generally is issued at the same time as the facility permit and includes specific requirements established by MDEP.
- Authorization to operate: Requirements to obtain this authorization from MDEP include:
 - Financial assurance has been secured.
 - As-built plans signed and stamped by a registered engineer are submitted to MDEP.
 - The facility has been constructed in accordance with the approved design plan.
 - All equipment and personnel are available.
 - Proof of receipt of all other necessary permits has been obtained.

Pathogen and Vector Attraction Reduction (32.81)

- *Pathogen reduction*: Must achieve process to further reduce pathogens (PFRP).
- *Vector attraction reduction*: Compliance with Federal 503 vector attraction reduction standards.

Pollutant Standards (32.12)

Compost for unrestricted use must not exceed the heavy metal standards in Table 32.12(2)(a).

Compost with heavy metals that do not exceed the standards in Table 32.12(2)(b) may be approved for use on a site-specific basis by MDEP.

Table 32.12(2)(a)

<i>Pollutant</i>	<i>mg/Kg (DW)</i>
Cadmium	14
Lead	300
Nickel	200
Zinc	2,500
Copper	1,000
Chromium	1,000
Mercury	10
Boron	300
Molybdenum	10
PCBs	1

Table 32.12(2)(b)

<i>Pollutant</i>	<i>mg/Kg (DW)</i>
Cadmium	25
Lead	1000
Nickel	200
Zinc	2,500
Copper	1,000
Chromium	1,000
Mercury	10
Boron	300
Molybdenum	10
PCBs	10

Monitoring, Recordkeeping and Reporting

Massachusetts does not have specific monitoring, recordkeeping and reporting regulations for composting facilities. Currently, MDEP regulatory staff works directly with a facility operator to establish acceptable procedures, which are based on a combination of draft composting facility regulation and 310 CMR 19.00 requirements.

Composting Testing and Use

Massachusetts does not have specific testing requirements for compost in its regulations. Currently, testing requirements for full-permit composting facilities are delineated in their operating permit by MDEP regulatory staff. MDEP has worked directly with facility operators to establish testing protocols. MDEP requires that composting testing include heavy metals, other pollutants, physical contaminants, compost stability, soluble salts and agronomic parameters.

Compost use is based on meeting the requirements of 310 CMR 32.00. A facility must first obtain a “Approval of Suitability” from MDEP for its compost product(s). Compost is classified in three categories, which correspond to the categories of sludge/septage for land application:

- Type I meets PFRP and does not exceed the heavy metal standards in Table 32.12(2)(a) and is permitted for unrestricted use without further MDEP approval.
- Type II meets PFRP or PSRP and does not exceed the heavy metal standards in Table 32.12(2)(b) and requires MDEP approval prior to its use on any site.
- Type III meets PFRP or PSRP and exceeds the heavy metal standards in Table 32.12(2)(b) and requires MDEP approval prior to its use on any site.

Appendix E – New Jersey

Introduction

When it first created its composting regulations in the early 1990s, New Jersey was at the forefront of state efforts to promote yard waste composting. Regulatory exemptions for large-scale yard waste facilities, combined with strong outreach and development, helped establish yard waste composting as standard practice. Most of the composting facilities operate under an exemption, which includes certain types of wood waste processing, leaf mulching, yard trash composting, and agricultural and on-site composting. However, the number of composting facilities has been steady since 1996. New Jersey has only one facility processing food waste. In recent years, the state scaled back its promotion and developments efforts, while the organics recycling industry has evolved.

New Jersey composting regulations are contained in *N.J.A.C. Chapter 7:26A: Recycling Regulations*. Chapter 7:26A also references *Subchapter 1 of N.J.A.C 7:26: General Provisions* for certain general requirements that apply to all solid waste facilities. Composting regulations for solid waste co-composting and composting facilities are found in Chapter N.J.A.C. 7:26-2B. The state regulatory agency is the New Jersey Department of Environmental Protection (NJDEP), referred as Department.

Subchapters 7:26A-1 through A-4 provide details about general provisions, fees, approval requirements, design requirements and operational requirements for composting facilities (for which New Jersey’s technical term is “Class C Recycling Centers”). New Jersey defines source-separated compostable material as Class C Recyclable Material, which includes, but is not limited to, source-separated food waste, source-separated biodegradable plastic and source-separated yard trimmings. A Class C Recycling Center will be referred to as a source-separated composting facility or simply a composting facility, in this summary.

Subchapter 7:26A includes the following sections related to organics recycling facilities:

- A-1 General provisions
 - A-1.3 Definitions
 - A-1.4 Exemptions
- A-3 Approval of Recycling Centers for Class B, Class C or Class D Recyclable Materials
 - A-3.1 General requirements
 - A-3.8 Additional requirements for wood waste recycling facilities

- A-3.18 Additional requirements for composting facilities
- A-4 Operational standards and general rules for all recycling facilities
 - A-4.1 Design and operating standards
 - A-4.4 Tonnage reporting requirements
 - A-4.5 Additional design and operational requirements for composting facilities

Certain types of composting facilities are exempted from the requirement to obtain a general or limited approval from the state (see Section 7:26A-1.4). All others must obtain approval to operate.

Chapter 7:26-2B provides details about additional engineering and operational requirements for composting facilities that handle solid waste and/or biosolids, including the following:

- 7:26-2B.6 Additional engineering requirements for composting and co-composting facilities.
- 7:26-2B.7 Additional operational requirements for solid waste composting and co-composting facilities.

Key Terms

The following definitions extracted from Section 7:26A-1.3 illustrate key terms used in New Jersey's compost regulations.

- “Brush” means branches, woody plants and other like vegetative material. Leaves and grass do not constitute brush.
- “Class B recyclable material” means a source-separated recyclable material which is subject to Department approval prior to receipt, storage, processing or transfer at a recycling center in accordance with N.J.S.A. 13:1E-99.34b, and which includes, but is not limited to, the following:
 1. Source-separated, non-putrescible, waste concrete, asphalt, brick, block, asphalt-based roofing scrap and wood waste;
 2. Source-separated, non-putrescible, waste materials – other than metal, glass, paper, plastic containers, corrugated and other cardboard – resulting from construction, remodeling, repair and demolition operations on houses, commercial buildings, pavements and other structures;

3. Source separated whole trees, tree trunks, tree parts, tree stumps, brush and leaves provided they are not composted;
 4. Source separated scrap tires; and
 5. Source separated petroleum contaminated soil.
- “Class C recyclable material” means a source-separated compostable material that is subject to Department approval prior to the receipt, storage, processing or transfer at a recycling center in accordance with N.J.S.A. 13:1E-99.34b, and which includes, but is not limited to, organic materials such as:
 1. Source separated food waste;
 2. Source separated biodegradable plastic; and
 3. Source separated yard trimmings.
 - “Compostable” means able to undergo physical, chemical, thermal and/or biological degradation under aerobic conditions such that the material to be composted enters into and is physically indistinguishable from the finished compost (humus), and that ultimately mineralizes (biodegrades to carbon dioxide, water and biomass) in the environment at a rate like that of known compostable materials such as paper and yard trimmings.
 - “Curing” means the last stage of composting that occurs after much of the readily metabolized material has decomposed. Curing provides for additional stabilization of the composted material.
 - “Recycling center” means a facility designed and operated solely for receiving, storing, processing or transferring source separated recyclable materials (Class A, Class B, Class C and/or Class D recyclable material). Recycling centers shall not include recycling depots, manufacturers or scrap processing facilities.
 - “Recycling center for Class C recyclable materials” or “Class C recycling center” means a facility that receives, stores, processes or transfers Class C recyclable materials as defined in this section.
 - “Source separation” or “source separated” means the process by which materials are separated at the point of generation by the generator thereof from solid waste for the purposes of recycling.

- “Yard trimmings” means grass clippings, leaves, wood chips from tree parts, and brush.

Section 7:26A incorporates by reference general solid waste definitions contained in Chapter 7:26. Notable definitions from Chapter 7:26A include the following:

- “Co-composting facility” means a solid waste facility that utilizes a controlled biological process of degrading mixtures of non-hazardous solid waste and sewage sludge.
- “Composting facility” means a solid waste facility that utilizes a controlled biological process for degrading non-hazardous solid waste.
- “Food waste“ means food processing by-products (food processing vegetative wastes and/or food processing residuals generated from food processing and packaging operations or similar industries that process food products), vegetative waste (produce trimmings and over-ripe produce generated by supermarkets, produce brokers and produce distributors), off-spec food products, food product overruns, and similar food waste materials.

Regulatory Categories of Organics Recycling Facilities

New Jersey has the following categories of organics recycling facilities:

- Exempt facilities
- Research & demonstration facilities
- Permitted facilities handling source-separated organics
- Permitted facilities handling solid waste and/or biosolids

All facilities applying for a permit have to get approval and follow the procedures in Chapter N.J.A.C. 7:26-16 except for facilities handling source-separated organics. This first approval deals with criminal and background check. The definitions and regulatory requirements for each category are summarized in the following sections.

Exempt Facilities (7:26A-1.4)

Section 7:26A-1.4(a).3 exempts certain facilities from obtaining a general or limited approval pursuant to Section 7:26A-3 regulations. These facilities shall not be exempted to comply with regulations contained in 40 C.F.R. Part 273 and county or municipal regulations. All facilities

should follow reporting requirements set forth in Section 7:26A-4.4. A facility must meet the following criteria to be exempt:

General Requirements (7:26A-1.4(b))

- *Reporting:* Tonnage report and written notice of operations.

Wood Waste Facilities (7:26A-1.4(a).3)

- *Feedstock:* Tree branches, tree limbs, tree trunks, brush, and wood chips derived from tree parts..
- *Storage:*
 - Unprocessed material: Not to exceed 7,500 cubic yards on-site and not to exceed 1 year on-site.
 - Maximum duration: One year for all material.
 - Processed material: Not to exceed 7,500 cubic yards.
 - Processing: Limited to 4 times per year, with each processing event limited to a 2-week period.

Leaf Mulching Facilities (7:26A-1.4(a).12)

- *Siting:* Land devoted to agricultural or horticultural use.
- *Processing:* Leaves shall be removed from bags, boxes or similar containers prior to spreading. These bags, boxes or containers shall be disposed appropriately.
- *Methodology:* Leaves shall be spread onto the field in a thin layer no higher than six inches.
- *Mixing:* No later than the next tillage season. The layered leaves shall be incorporated into the soil.

Yard Trimmings Composting (7:26A-1.4(a).13)

- *Size Restriction:* No more than 10,000 cubic yards are received per year.
- *Feedstock and Size Restriction:* Grass clippings shall not exceed 10% by volume of yard trimmings received.
- *Siting:* Receipt and processing of yard trimmings does not occur on land purchased through the Green Acres bond act or listed as land for recreation, municipally owned parks, wildlife sanctuaries, recreational facilities or other similar open public spaces.

- *Operations:* The facility is included in the solid waste management plan of the district.
- *Siting:* The windrow composting area shall not exceed three acres.
- *Siting:* Composting windrows shall be at least 50 feet from any property line and 150 feet from any property line of human occupancy or 500 feet if grass clippings are received.
- *Ponding:* Storage areas and access roads shall be constructed to prevent accumulation of surface water on-site.
- *Siting:* Must use an effective visual screen buffer on the perimeter.
- *Operations:* A water supply and firefighting equipment shall be readily available to extinguish any fires.
- *Operations:* The NJDEP should approve the composting method, including the regulation of ripping bags, moisture, processing time, drainage, height and width of windrows, separation between windrows, and feedstock mixing and turning.
- *Training:* The yard trimming composting operators shall attend a composting course sponsored by the Rutgers Extension County Agricultural or Resource Management Agents or other courses approved by the Department.
- *Product Use:* Finished compost product is applied on-site on agricultural or horticultural land, subject to an approved agricultural management plan, mining area restoration plan, or other plan defined by the National Resources Conservation Service.

Agricultural Composting (7:26A-1.4(a).18)

- *Product Use:* Only on-site, applied on an agricultural or horticultural land, and application has to be approved.
- *Processing:* Yard trimmings shall be removed from bags, boxes or similar containers prior to spreading. Biodegradable plastic bags can be shredded or cut. These bags, boxes or containers shall be disposed appropriately.
- *Windrows:* Yard trimmings should be placed in windrows.
- *Siting:* Composting windrows shall be at least 50 feet from any property line and 150 feet from any property line of human occupancy or 500 feet if grass clippings are received.
- *Fire protection:* Water supply and firefighting equipment shall be readily available.
- *Composting method:* Shall allow for the aerobic biodegradation of yard trimmings.

On-site composting (7:26A-1.4(a).21)

- *Feedstock:* Generated on-site.
- *Site restriction:* Must be processed on-site.
- *Product use:* For sale and/or use off-site.

Research, Development and Demonstration (RD&D) projects (7:26-1.7(f))

- *Certificate to operate:* Provided by the Department.
- *Topic:* New or innovative technology or a new or innovative operational process modification to an existing solid waste facility & recycling facility.
- *Operation:* It should meet the Department's standards for air emissions, water discharges and soil quality.
- *Duration:* For a fixed period not to exceed 1 year with some exceptions. It should not exceed 5 years with no exceptions.
- *Design capacity:* Less than 100 tons per day of waste or material, unless approved by the Department.
- *District Solid Waste Management Plan:* The project should be incorporated with it.
- *Application Requirements:* The owner and/or operator of the proposed RD&D project shall submit the following information:
 - Site plan map
 - Process flow diagrams
 - Duration
 - Description of the need of the project
 - improvement
 - Mitigation for noise, air quality, traffic, and stormwater runoff.
 - Sampling and analytical plan
 - Quality control plan
 - Inclusion in the district solid waste management plan
- *Reporting:* Semi-annual progress reports and a final report.

Permitted Facilities Handling Source-Separated Organics (7:26A-3)

Section 7:26A-3 describes the requirements for non-exempt organics recycling facilities that accept source-separated organics (Class C Recyclables) to obtain an approval from NJDEP. The requirements are organized into the following subjects.

- Application requirements.
- Design and operating requirements.
- Monitoring, recordkeeping and reporting.
- Product testing and use.

Application Requirements (7-26A-3.2 & 7-26A-3.18)

Prior to operating a recycling center handling Class B, Class C or Class D recyclable materials, the owner or operator shall submit information demonstrating compliance with all applicable design and operating requirements. The application shall include all the information and all maps listed below.

- Facility and property owner information.
- Tax and zoning map.
- Quantity and characteristics of feedstocks, including contaminants.
- List and quantity of products and residues.
- End-markets.
- Equipment list and specifications.
- Detailed site plan by licensed engineer or surveyor.
- Original 7.5 minute USGS Quadrangle map.
- Ownership deed.
- Design capacity.
- Air pollution control permit (if applicable).
- Documentation of inclusion in the local solid waste management plan.
- Detailed operations plan.
 - Written narrative explanation.
 - Hours of operation.
 - Incoming Materials Specifications Sheet and Certification.
 - Recyclable Materials Receipt Form and Certification.
 - Incoming Materials Inspection Plan.
- Traffic control methods and traffic impact analysis.
- Leachate and storm water control measures.
- Soil erosion control methods.
- Noise control methods.
- Financial Assurance, which depends on the following criteria:
 - History of enforcement actions.

- Current cost of disposal.
- Amount of material.
- Types of materials.
- Lease agreement.
- Analysis of the stability of end-markets for the Class B, Class C or Class D recyclable material handled.
- A surety bond guaranteeing performance of closure.

Additional application requirements for source-separated waste facilities (7:26A-3.18)

In addition to the above, the owner or operator of a source-separated waste composting facility must submit the following information:

- Monitoring, sampling and testing plans.
- Contingency operations plan due to inclement weather.
- Fire protection plans.
- Vector, dust and litter controls.
- Distances to property lines.
- Soil characteristics.
- Odor management plan.
- Impact on surface and ground water, and any wetlands.
- Impact on land uses.
- Facility design plan: flow diagram, equipment, infrastructure.

Additional application requirements for wood waste recycling facilities (7:26A-3.8)

- Fire control plan.

Design and Operating Requirements (7-26A-4.1, 4.2, 4.3 & 4.5)

Owners or operators of composting facilities handling source-separated compostable materials must comply with the following general design and operational standards.

- *Feedstock:* All recyclable materials handled shall have been separated at the point of generation or at a permitted solid waste facility. Class C recyclable materials can be commingled only with other Class C recyclable materials.

- *Residue storage:* Residue shall be stored on-site less than 6 months, separate from recyclable material, in a manner to prevent leakage, and should be disposed according to the district's waste plan.
- *Operations:* Free of litter and debris.
- *Operations:* For all recycling centers located within the Pinelands Protection Area, the Pinelands Commission shall approve their operations.
- *Traffic Control:* The operation shall not impact traffic significantly as defined by the New Jersey Department of Transportation Highway Access Management Code N.J.A.C. 16:47 at any intersection or public roadway within a half-mile radius of the recycling center.
- *Siting:* An effective visual screen buffer shall separate the recycling center from adjacent land.
- *Site access:* Prevent unauthorized access.
- *Traffic Control:* Areas for vehicular usage shall be suitably compacted and, where necessary, paved.
- *Fire control:* A water supply and firefighting equipment shall be readily available, as shall be the number of the local fire department.
- *Construction:* It should be in compliance with the New Jersey Uniform Construction Code, N.J.S.A. 52:27D-119 et seq.
- *District's solid waste management plan:* The facility should be included in it.
- *Right of entry:* The department shall be authorized to enter the facility under certain conditions.
- *Annual Tonnage Report:* Amount of source-separated material received.

Additional for yard trimmings facilities (7:26A-4.5(a))

The regulations define the following acceptable technologies for yard trimmings composting facilities (other methods may be approved by NJDEP).

- *Minimal technology method:* Windrows' maximum height shall be 12 feet with a base not to exceed 24 feet; minimum separation of 16 feet between the pile base of each windrow. Windrow turning and reconstruction shall occur at least 1 time a year minimum.
- *Low level technology method:* Windrows' maximum height shall be 6 feet, with a base not to exceed 14 feet; a minimum separation 16 feet between the pile base of each windrow. Windrow turning and reconstruction shall occur at least 3 times during the 12-

to-18-month compost cycle – 1 time during the first two months, at 4 to 6 months into the composting cycle, and at the tenth month.

- *Intermediate technology method:* The windrows' dimensions and the minimum windrow separation shall correspond to the recommended operation of the windrow turning equipment used. Windrow turning should occur once a week during the first month of the 12-month composting cycle. Temperature and oxygen concentration shall be monitored and further turnings shall be scheduled to prevent temperatures from exceeding 140 degrees Fahrenheit and to prevent oxygen levels from dropping below 5% for prolonged periods.
- *High level technology method:* Windrows are constructed and reconstructed within an enclosed facility with air flow controlled venting. Forced aeration or mechanical agitation shall be controlled to complete the compost cycle in 3 to 6 months.

Composting facilities that handle only yard trimmings must comply with the following additional design and operating criteria.

- *Siting:* The facility shall not be located on land purchased with money from the Green Acres bond act or that is designated as land for recreation and conservation purposes.
- *Siting:* If the incoming waste contains grass, it shall be received in areas that are at least 1,000 feet from any areas of human use or occupancy.
- *Siting:* Materials staging and processing shall be done in areas that meet the following buffer distance requirements:
 - *Minimal technology:* >2,500 from sensitive land uses
 - *Low technology:* >50 feet from property line and >500 feet from sensitive land uses
 - *Intermediate technology:* >50 feet from property line, >250 feet from inhabited structures, and >150 feet from sensitive land uses or >1,000 feet from sensitive land uses if grass clippings are handled
 - *High technology:* >50 feet from other structures
- *Feedstock restriction:* Facilities utilizing minimal and low technology shall not handle grass
- *Feedstock:* Shall be received only when the operator or owner is present.
- *Feedstock:* Shall be removed from bags, boxes or similar containers except for biodegradable bags, if the processing equipment provides for a shredding or cutting action.
- *Operations:* The facility shall have the capacity to handle projected incoming volumes of yard trimmings.

- *Operations control:* The supervision shall be under a properly trained individual.
- *Site access:* Shall be prohibited when the recycling center is closed.
- *Processing:* Shall begin the day the yard trimmings are received.
- *Operator training:* Within 1 year of the operation, the operator should attend a composting course sponsored by the Rutgers Cooperative Extension, the county's agricultural or resource management agents, or any other course recognized by the Department.
- *Active composting surface:* Compacted clay, gap-graded crushed aggregate, asphalt or other such surface that can withstand heavy equipment impact shall be used; sloped to prevent ponding and surface run-off.
- *Processing:* Dry yard trimmings shall be moistened to saturation without producing excessive runoff, prior to windrow formation.
- *Windrow formation:* Each windrow shall be constructed and positioned perpendicular to the contours of the ground surface.
- *Windrow turning:* A windsock shall be installed at the recycling center to determine appropriate times for windrow turning operations.
- *Site closure:* Submit plans within 1 year of operation, including a schedule, description of steps and description of financing. Publish a notice of closure in a newspaper.

Additional requirements for other source-separated organic waste facilities (7:26A-4.5(b))

Composting facilities that handle source-separated organic waste – other than just yard trimmings – must comply with the following additional design and operating criteria:

- *Enclosed Operations:* The facility shall be fully enclosed except in those cases where vegetative food is the only food material received. If it is not fully enclosed, materials shall be accepted and handled >1,000 feet from any areas of human use or occupancy and processed on the day of receipt.
- *Operations:* Enough capacity to handle projected incoming volumes of material.
- *Composting floor:* Impermeable (10^{-5} cm/sec or greater), and shall be sloped to prevent ponding of liquids. Leachate should be directed to a leachate collection system.
- *Operations and Maintenance (O&M) Manual:* Includes quality control plan, and monitoring, sampling and analysis plans.
- *Equipment:* It should be operated in conformance with the manufacturer and/or vendor specifications.

- *Training:* All employees shall be trained in the operations, maintenance procedures, and safety and emergency procedures. A recycling center-specific training manual shall be given to each employee.
- *Processing:* It shall begin within 3 days of the material's receipt at the facility. If it contains grass or other highly putrescible materials, it should begin the same day.
- *Process to Further Reduce Pathogens (PFRP):* One of the three following PFRP methods shall be used in accordance with 40 C.F.R, Part 503: turned windrow, aerated static pile, or enclosed vessel.
- *Temperature monitoring:* Daily monitoring to ensure pathogen reduction criteria are met.
- *Finished Compost:* It should not be stored more than 15 months. If it is not used before 15 months, it shall be removed or reprocessed for use or sale.
- *Site closure:* Submit plans within 1 year of operation, including a schedule, description of steps and description of financing. Publish a notice of closure in a newspaper.

Monitoring, Recordkeeping and Reporting (7-26A-3.17 & 4.4)

All source-separated organic waste composting facilities holding a general or limited approval shall follow these requirements:

- *Daily Record:*
 - Amounts of each recyclable material by type and origin, received, stored, processed or transferred
 - Contact information of the end-markets for all recyclable materials transported
 - The amount of residue disposed of, including the name and registration number of the collector/hauler
- *Waste disposal certification:* All recycling centers shall certify in writing to the Department that all residue generated at the recycling center has been disposed properly.
- *Annual Report:* Monthly summary statements of information contained in daily operational records.
- *Annual tonnage report:* Submit a recycling tonnage report each year to the county of origin and all municipalities from which compostable materials were received.

Additional requirements for yard trimming facilities (4.5(a)7)

Composting facilities that handle only yard trimmings must comply with the following additional recordkeeping and reporting criteria.

- *Incoming materials record:* Quantities received (expressed as cubic yards of leaves, grass and/or brush) and the source.
- *Compost testing records:* Results of laboratory analyses of finished compost.

Additional requirements for other source-separated organic waste facilities (4.5(b)18)

Composting facilities that handle source-separated organic waste other than just yard trimmings must comply with the following additional recordkeeping and reporting criteria.

- *Monitoring schedule:* The Department shall establish an appropriate monitoring and sampling schedule for a one-year start-up period as part of the recycling center approval. Using the information from the first year, the Department will approve a monitoring and sampling schedule for ongoing operations.
- *Temperature & moisture record:* Daily temperature and moisture monitoring records
- *Incoming materials record:* Quantities received (expressed as cubic yards of leaves, grass and/or brush) and the source.
- *Compost testing records:* Results of laboratory analyses of finished compost.
- *Compost retention time:* Retention time of finished compost.
- *Distribution records:* Sale and distribution of recovered materials.
- *Quarterly report:* Providing summary of all records maintained at the facility.

Product Testing and Use (7-26A-4.5(c))

All source-separated organic waste composting facilities must comply with the following testing and product use requirements.

- *Finished Compost Testing:* Samples must be analyzed for the parameters listed in Appendix A.
 - *Yard trimmings facilities:* Testing at a minimum once each year. Less frequent testing may be approved by NJDEP on a case-specific basis.
 - *Other source-separated organic waste facilities:* Samples must be obtained in accordance with approved QA/QC plan and sampling plan.
- *Laboratory certification:* It should be certified in accordance with N.J.A.C. 7:18 for the equipment and testing procedures.
- *Distribution:* Compost given away or offered for sale must contain a label. If it is offered for bulk sale, signs or printed literature should be provided.
- *Heavy Metals Limit:* All compost shall satisfy 40 C.F.R. 503 pollutant concentrations.

- *Pathogen Reduction:* Compost derived from source-separated organic waste in addition to yard trimmings shall meet 40 C.F.R. 503 Class A PR requirements.
- *Vector Attraction Reduction:* Compost derived from source-separated organic waste in addition to yard trimmings shall meet requirements of 40 C.F.R. 503 VAR requirements.

Permitted Solid Waste Composting & Co-composting Facilities (7:26-2B)

Facilities that compost solid waste and/or biosolids must obtain a solid waste facility permit from NJDEP. The requirements of 7:26-2B are in addition to the general solid waste facility application, design and operating requirements of N.J.A.C. 7:26-2.10 & 2.11. A brief overview of the requirements is provided below and organized into the following topics.

- Application requirements
- Design and operating requirements
- Pathogen reduction and vector attraction reduction
- Pollutant limits
- Monitoring, recordkeeping and reporting
- Product testing and use

Application Requirements

All solid waste composting and co-composting facilities must submit an engineering report as part of an application to construct and operate. The following list identifies the many items that must be addressed in the report.

- Source and characteristics of solid waste and biosolids
- Traffic analysis
- Utilities description
- Process description and management
- Process flow diagram
- Materials balance
- Contingency disposal options
- Layout of structures
- Operation and maintenance manual
- Closure plan
- Soil borings

Design and Operating Requirements (7:26-2B.6 & 2B.7)

Solid waste composting and co-composting facilities must comply with design and operating requirements that include the following, which are in addition to general operational requirements of 7:26-2.11.

- *Covered areas:* Receiving, processing, production and curing areas.
- *Floor structure:* Impermeable (10⁻⁷ cm/sec) and sloped to prevent ponding of liquids and to direct leachate into the leachate collection system.
- *Siting:* Building enclosures shall be at a minimum of 100 feet from the property line. An open operations area shall be a minimum of 2,500 feet from the nearest sensitive environmental receptor.
- *Leachate control:* Leachate collection and removal system in place.
- *Site Access:* Prevent unauthorized access.
- *Environmental control:* Methods for odor, noise, vector, dust and litter control.
- *Fire control:* Fire protection and control features.
- *Processing:* Incoming waste shall be processed within 3 days. Incoming waste containing grass shall be processed within 24 hours. If it is not processed in this time, it shall be disposed.
- *Operations:* Must have enough capacity to handle projected incoming volumes of waste.
- *Operations:* Provisions for operations during wind, heavy rain, snow, freezing or other inclement weather conditions.
- *Storage:* Capacity for 3 days for incoming wastes waiting to be processed; capacity for finished compost not to exceed 15 months' production.
- *Occupational health and safety plan:* In conformance with the safety and health standards of the Federal Department of Labor, Occupational Safety and Health Administration, pursuant to 29 C.F.R. 1926 and 1910 Safety and Health Standards and Industrial Standards.
- *Training plan:* All employees shall be trained in appropriate facility operations, maintenance procedures, and safety and emergency procedures in accordance with the training plan, including initial and annual follow-up training.
- *Closure:* Within 10 days, all residuals and waste shall be removed from the site and recycled or disposed, and the machinery, equipment, floors and facility shall be cleaned.

Pathogen Reduction and Vector Attraction Reduction

Solid waste composting and co-composting facilities shall meet 40 C.F.R. 503 Class A PR requirements and VAR requirements

Pollutant Limits

Compost shall meet 40 C.F.R. 503 pollutant concentrations limits.

Monitoring, Recordkeeping and Reporting

Solid waste composting and co-composting facilities must comply with monitoring, recordkeeping and reporting requirements that include the following, which are in addition to the solid waste facilities records maintenance requirements of 7:26-2.13.

- *Monitoring schedule:* Monitoring and sampling schedule for the first year included in the permit. With the information gathered from the first year, the NJDEP develops a monitoring and sampling schedule for the ongoing operation of the facility.
- *Temperature monitoring:* Temperature shall be recorded daily to ensure pathogen reduction.
- *Daily records:* In addition to the requirements of 7:26-2.13(a), maintain daily records of temperature and moisture, laboratory analyses, retention time of the composted material, and sale and distribution of recovered materials.
- *Quarterly Report:* Includes quantities handled, compost analysis, daily temperature readings, retention times during the composting process, and summary of leachate management.

Product Testing and Use

- *Laboratory:* Compost analysis shall be done by a laboratory certified pursuant to N.J.A.C. 7:18.
- *Finished compost:* If finished compost has not been distributed for more than 15 months, then it should be reprocessed or disposed of.
- *Compost sampling:* Analyzed for the compost quality monitoring parameters listed in Appendix A with methods approved in the sampling plan.
- *Compost Distribution:* Compost given away or offered for sale must contain a label. If it is offered for bulk sale, signs or printed literature should be provided.

Table 1 – Compost Quality Monitoring Parameters

<i>Parameter</i>	<i>Unit</i>
Stability—respirometry	mg O2/Kg
O2, consumed	VS/hr
Soluble salts—electrical	mmhos/cm
Fecal coliform	MPN/g
Salmonella	MPN/4g
PH	
<i>Regulated parameters:</i>	<i>Unit</i>
Arsenic (As)	mg/kg dry wt.
Cadmium (Cd)	mg/kg dry wt.
Chromium (Cr)	mg/kg dry wt.
Copper (Cu)	mg/kg dry wt.
Lead (Pb)	mg/kg dry wt.
Mercury (Hg)	mg/kg dry wt.
Molybdenum (Mo)	mg/kg dry wt.
Nickel (Ni)	mg/kg dry wt.
Selenium (Se)	mg/kg dry wt.
Zinc (Zn)	mg/kg dry wt.
Man-Made Inerts > 4 mm, < 13 mm	Visual
Film plastic > 4 mm	cm2/m3
Sharps	PRS

Notes:

1. VS means volatile solids.
2. MPN means most probable number per gram of total solids in the sewage sludge or compost. MPN is an index of the number of coliform bacteria, reported by the multiple-tube fermentation procedure of the coliform test, that, more probably than any other number, would give the results shown by the laboratory examination. It is not an actual enumeration.
3. Mmhos is a unit of electrical conductivity. It is the reciprocal of ohm.
4. Man-made inert material includes glass shards and metal fragments that pose a human and animal safety hazard with unprotected exposure or through direct ingestion.
5. Film plastic can be a potential hazard to small animals through direct ingestion.

Appendix F – New York

Introduction

New York has established both regulatory categories (exemption, registration, research and full permit) and also progressive levels of regulations for full-permit facilities. For example, large yard trash composting facilities that require a full permit are subject to fewer requirements than mixed waste composting facilities. The regulatory categories consider both type of feedstock and size of facility.

New York composting regulations are contained in *Title 6 New York Codes Rules and Regulations (NYCRR) Part 360-5: Compost and Other Class A Organic Waste Processing Facilities*. Part 360-5 also references *Part 360-1: General Provisions* for certain general requirements that apply to all solid waste facilities. The state regulatory agency is the New York State Department of Environmental Conservation (NYSDEC).

Part 360-5 regulates the construction and operation of organic waste processing (OWP) facilities for mixed waste, source-separated organic waste, biosolids, septage, yard waste and other solid waste. The definition of an OWP facility includes any facility involved in processing readily biodegradable organic components of solid waste, including but not limited to composting, heat drying and chemical stabilization.

Part 360-5 is divided into the following major sections:

- 5.1 – Applicability
- 5.2 – Definitions
- 5.3 – Exemptions and registration
- 5.4 – General permit application requirements for organic waste processing facilities
- 5.5 – Organic waste processing facilities biosolids, mixed solid waste, septage and other sludges
- 5.6 – Source-separated organic waste composting facilities
- 5.7 – Yard waste composting facilities
- 5.8 – Products generated outside New York State *
- 5.9 – Research projects
- 5.10 – Tables

* Section 360-5.8 deals specifically with distribution and sale of organic waste derived products from outside of New York and is not described in this report.

Certain types of OWP facilities are either exempted from regulation or allowed to simply register with the state (see Section 360-5.3). All other OWP facilities must obtain a permit from NYSDEC to construct and operate. Permit application must meet the requirements of Section 360-5.4. In addition to Section 360-5.4 requirements, Sections 360-5.5 through 360-5.9 delineate requirements for specific types of OWP facilities.

Key Terms

The following definitions extracted from Section 360-5.2 illustrate key terms used in New York's compost regulations.

- “Amendment” means an organic material added to waste prior to composting to reduce bulk weight and increase air voids, and to increase the quantity of degradable organics.
- “Bulking Agent” means a material added to waste to increase porosity and facilitate aeration during composting.
- “Gross contaminants” means constituents of the solid waste stream that are not readily decomposed and may be present in a product including, but not limited to, pieces of metal, glass, plastic, rubber, bones and leather. “Gross contaminants” does not include sand, rocks, wood pieces and other similar materials.
- “Mature” means the characteristics of a soil conditioning material that render it harmless to the plant grown when used as a topsoil or soil supplement and make it sufficiently stable that it will not generate offensive odors during storage, handling or ultimate use.
- “Organic waste processing (OWP) facility” means a facility involved in the processing of readily biodegradable organic components in solid waste to produce a mature product for beneficial use as a source of nutrients, organic matter, liming value, or other essential constituent for a soil or plant. The processes include, but are not limited to, composting, heat drying and chemical stabilization.
- “Source-separated organic waste” (SSOW) means readily degradable organic material that has been separated from non-compostable material at the point of generation

including, but not limited to, food waste, soiled or unrecyclable paper, and yard waste in combination with any of the former materials. It does not include biosolids, sludge or septage.

- “Waste derived soil conditioning product” means a mature material that meets the criteria of this Subpart that can be used beneficially as a source of nutrients, organic matter, liming value or other essential constituent for a soil or plant.

Part 360-5 incorporates by reference general solid waste definitions contained in Part 360-1. Notable definitions from Section 360-1.2 include the following:

- “Composting facility” means a solid waste management facility used to provide aerobic, thermophilic decomposition of solid organic constituents of solid waste to produce a stable, humus-like material.
- “Source separation” means dividing solid waste into some or all of its component parts at the point of generation, including the separation of recyclables from each other or the separation of recyclables from other solid waste. The residue remaining after recyclables are removed from the waste stream is not considered source-separated material.
- “Yard waste” means leaves, grass clippings, garden debris, tree branches, limbs and other similar materials, such as aquatic weeds.

Regulatory Categories of Organics Recycling Facilities

- Exempt Facilities
- Registration Facilities
- Research Projects
- Full Permit Facilities
 - Yard Waste Composting
 - Source-separated Organic Waste (SSOW) Composting
 - Mixed Waste, Biosolids, Septage, Sludge Composting

Regulatory requirements for each category are summarized in the sections that follow.

Exempt Facilities (360-5.3)

Section 360-5.3(a) exempts certain facilities from Part 360-5 regulations. A facility must meet the following criteria to be exempt:

- *Operations*: Does not produce unreasonable dust or odor impacts on neighbors.
- *Operations*: No material accepted at the facility remains unprocessed for more than 36 months.
- *Feedstock*: Composting facility that accepts animal manure and associated bedding material.
- *Feedstock and size restriction*: Composting facility that accepts no more than 3,000 cubic yards per year of yard waste, not including woody waste not intended for composting (e.g., grinding only).
- *Feedstock and size restriction*: Composting facility that accepts a combination of wastes that would be exempt operating individually for each type of waste (e.g., 3,000 cubic yards of yard waste plus animal manure).

Registration Facilities (360-5.3)

Section 360-5.3(b) defines the thresholds and conditions for facilities that are eligible for registration rather than full-blown permit requirements. Facilities eligible for registration must comply with the following requirements:

- *Siting*: The facility is at least 200 feet from any surface water, potable water well, residence or place of business. The separation distance may be increased to 500 feet in densely populated or otherwise sensitive areas.
- *Design*: The facility is constructed to minimize ponding on the composting area.
- *Operations*: No material accepted at the facility remains on-site for more than 36 months.
- *Operations*: The facility uses acceptable amendments or bulking agents and follows an acceptable composting method that minimizes odors and produces a mature product.
- *Feedstock and size restriction*: Composting facility that accepts 3,000 to 10,000 cubic yards per year of yard waste not including woody waste not intended for composting (e.g., grinding only).
- *Feedstock and size restriction*: Composting facility that accepts no more than 1,000 cubic yards per year of source-separate organic waste.
- *Feedstock*: Composting facility for food processing waste.

Specific Requirements for Research Projects

Section 360-5.9 describes requirements for composting research projects. It is organized into the following subsections:

- Permit application requirements
- Design and operating requirements
- Permit restrictions

In general, the requirements for engineering plans, reports and specifications found elsewhere in Part 360 may be modified for facilities used solely for research under the direction of a licensed engineer or scientist affiliated with an accredited university or research institution.

Permit Application Requirements (360-5.9 (a))

The permit application requirements for a research project for an OWP facility must include a copy of the research proposal that includes:

- *Proposed activity:* Detailed description.
- *Operations plan:* Detailed discussion of objectives, schedule, location, equipment, monitoring, feedstocks, and evaluation methods.
- *General information:* Any information required by Part 360-5 as required by NYSDEC.
- *Personnel:* Description of personnel and their responsibilities.
- *Land use permission:* Written permission of all landowners, if not the applicant.

Design and Operating Requirements (360-5.9 (b))

Research projects are subject to the following requirements:

- *Quantity of waste:* Limited to amount necessary to address the research objectives.
- *Project summary report:* A report must be submitted to the NYSDEC within 90 days after permit expiration that summarizes project objectives, project results, and any operating problems encountered

Permit Restrictions (360-5.9 (c))

Research, development and demonstration permits are subject to restriction and renewal criteria in Section 360-1.13, which include:

- *Permit time limit:* One year unless renewed .
- *Permit renewal:* May not exceed 3 one-year renewals.
- *Feedstock limit:* Receipt and treatment of only the types and quantities of waste as determined by NYSDEC.
- *Environmental protection:* Any restrictions determined necessary by NYSDEC to protect human health and the environment.
- *Immediate termination:* May be ordered if necessary to protect human health and environment.

Full Permit Facilities (360-5.4)

All other types of composting facilities must obtain a permit from NYSDEC. Permitting requirements are more extensive as the type of feedstock changes: Yard waste facilities have fewer requirements than SSOW facilities, which have fewer requirements than solid waste and co-composting facilities.

All OWP facilities must submit an engineering report as part of an application to construct and operate. This report must comply with Section 360-5.4 as well as general requirements laid out in Section 360-1.9. The engineering report must provide:

- Maps
- Source of waste
- Engineering plans and specifications
- Operations plan
- Monitoring, sampling and analysis plan
- Product maturity testing and distribution plan
- Contingency plan
- Operations and maintenance plan
- Odor management plan
- Closure plan
- Facility and property owner

- List of personnel and their responsibilities

Section 360-1.9 requirements address the general form and layout for application submittals (e.g., level of detail, drawing size, report format, required stamps and certifications, etc.)

Specific Requirements for Yard Waste Composting Facilities (360-5.7)

Section 360-5.7 describes requirements for yard waste (YW) composting facilities. It is organized into the following subsections:

- Additional application requirements
- Design and operating requirements
- Monitoring, record keeping and reporting

Additional Application Requirements (360-5.7(a))

In addition to the requirements in Section 360-5.4, the engineering report must provide:

- *Feedstock characterization:* A description of the sources, quantities and composition of YW.
- *Soil characteristics:* Description of surface soil characteristics.
- *Depth to ground water and bedrock:* Documentation of depth to seasonal high groundwater and bedrock.
- *Composting process:* A description of all composting activities.

Design and Operating Requirements (360-5.7(b))

Design and operating requirements in Section 360-5.6(d) address the following:

- *Certificate of construction:* If construction is required, certification by a licensed engineer that facility was constructed in accordance with the engineering report.
- *Acceptable feedstocks:* Only YW and wastes that qualify for exemption or registration may be accepted.
- *Monitoring wells:* Monitoring wells may be required if soils are not low permeability.
- *Leachate control:* Leachate run-off from the site must be controlled (uncovered facilities must be designed to handle 10-year 1-hour storm).
- *Ponding:* Facility must constructed to minimize ponding.

- *Windrow construction and turning frequency:* Must be sufficient to maintain aerobic conditions.
- *Siting:* At least 200 feet from residences and businesses, with some exceptions that may be approved.
- *Siting:* For facilities without pad or leachate collection system, 200 feet from potable water well or surface water and 25 feet from drainage swale.
- *Flood prevention:* Facility must not be constructed on flood plains unless flood control provisions are approved.
- *Depth to groundwater/bedrock:* At least 24 inches for composting unless compost occurs on a low permeability surface.
- *Depth to groundwater/bedrock:* At least 5 feet for any leachate impoundments with 10,000-gallon or more capacity; at least 2 feet for any impoundments with less than 10,000-gallon capacity.
- *Odor control:* Must be controlled to a level normally expected for a well-operated facility.
- *Heavy metals limits:* Pollutant levels in products must not exceed specific concentrations for heavy metals.
- *Product use:* Products may be used for food crops, feeds crops and fiber crops.

Monitoring, Record Keeping, and Reporting (360-5.7(c))

Section 360-5.7(c) delineates requirements for monitoring, record keeping and reporting.

- *Daily operational records:* Must be maintained for the facility.
- *Product quality:* Products must be tested annually for nutrients.
- *Leachate analysis:* May be required.
- *Annual report:* A detailed report must be submitted.

Specific Requirements for Source-separate Organic Waste Composting Facilities (360-5.6)

Section 360-5.6 describes requirements for source-separated organic waste (SSOW) composting facilities. It is organized into the following subsections:

- Additional application requirements
- Pathogen and vector attraction reduction
- Pollutant limits and product use

- Design and operating requirements
- Monitoring, record keeping and reporting

Additional Application Requirements (360-5.6(a))

In addition to the requirements in Section 360-5.4, the engineering report must provide:

- *Feedstock characterization*: Detailed information for all sources of SSOW and bulking agents or amendments (sources, quantity and composition).
- *Collection method*: Description of source-separation program and how non-compostables are kept out of SSOW.
- *Pathogen reduction (PR) and vector attraction reduction (VAR)*: Detailed description of proposed processes and monitoring procedures.
- *Soil characteristics*: Description of surface soil characteristics for facilities operating on a soil base without a low permeability pad.
- *Depth to ground water and bedrock*: Documentation of depth to seasonal high groundwater and bedrock for facilities operating on a soil base without a low permeability pad.

Design and Operating Requirements (360-5.6(d))

Design and operating requirements in Section 360-5.6(d) address the following:

- *Certificate of construction*: Certification by a licensed engineer that facility was constructed in accordance with the engineering report.
- *Product storage limit*: On-site product storage limited to 24 months.
- *Leachate control*: Must be managed in an approved manner (designed to handle 10-year 1-hour storm); leachate storage facilities must be emptied and cleaned every 12 months.
- *Ponding*: Facility must be constructed to minimize ponding
- *Leachate control*: For facilities handling 5 tpd or more of SSOW, waste storage, processing, leachate storage and product storage areas must be constructed to minimize leachate release (i.e., low permeability soils, geomembranes, asphalt, concrete).
- *Monitoring wells*: For facilities handling less than 5 tpd of SSOW, monitoring wells may be required if soils are not low permeability.
- *Depth to groundwater/bedrock*: At least 24 inches for composting.
- *Depth to groundwater/bedrock*: At least 5 feet for any leachate impoundments.

- *Vector and odor control:* Must be controlled to a level normally expected for a well-operated facility.
- *Flood prevention:* Facility must not be constructed on flood plains unless flood control provisions are approved.
- *Separation distances:* At least 500 feet from residences and businesses, with some exceptions that may be approved.
- *Separation distances:* For facilities without pad or leachate collection system, 200 feet from potable water well or surface water and 25 feet from drainage swale.
- *Source-separation of organic waste:* Facility can accept SSOW only from generators with program to separate inorganic and non-compostable waste from SSOW.
- *Enclosed operations:* Waste unloading, storage and processing areas must be enclosed for all facilities handling 100 tons per day or more.

In addition, SSOW composting facilities must comply with general requirements for all solid waste facilities contained in Section 360-1.14, which addresses the following issues:

- Surface water and groundwater protection
- Leachate minimization and control
- Restriction of public access
- Control program for unauthorized waste
- Facility maintenance and operation
- Contingency plan
- Monitoring
- Record keeping
- Litter control
- Dust control
- Vector control
- Odor control
- On-site road maintenance
- Noise control
- Open-burning prohibition
- Employee facilities
- Salvaging
- Closure

Pathogen and Vector Attraction Reduction (360-5.6(b))

An SSOW composting facility must achieve PR and VAR criteria defined in Section 360-5.6(b).

- *PR standard:*
 - Fecal coliform < 1,000 MPN per gram DW, or
 - Salmonella sp. < 3 MPN per 4 grams DW, and
 - Use of a PFRP (process to further reduce pathogens) technology defined in Section 360-5.6(b)

- *VAR standard:*
 - 38% reduction in volatile solids, or
 - Specific oxygen uptake rate (SOUR) of < 1.5 mg oxygen per hour per gram DW at 20 degrees Celsius, or
 - 14 day retention at > 40 degrees Celsius and average > 45 degrees Celsius

Pollutant Limits and Product Use (360-5.6(c))

Products from SSOW composting facilities must meet the criteria of Section 360-5.6(c); otherwise they must be disposed. Section 360-5.6(c) contains the following standards for pollutants and product distribution and use:

- *Product metals limits:* Pollutant levels in products must not exceed specific concentrations for heavy metals.
- *Maximum level of contaminants:* Products cannot have more than 2 percent gross contaminants.
- *Maximum product particle size:* Product particle size must not exceed 10 millimeters, except for wood particles used as bulking agent of amendment in compost.
- *Minimum detention time:* Compost product must come from a process with a minimum 50 days' detention time including active composting and curing.
- *Informational labeling:* Products must be labeled or distributed with information about the producer, the type of waste feedstocks, the metals content, and usage recommendations and restrictions.
- *Product use:* Products may be used for food crops, feeds crops and fiber crops.

Monitoring, Record Keeping and Reporting (360-5.6(e))

Section 360-5.6(e) delineates requirements for monitoring, record keeping and reporting.

- *Product testing:* Compost products must be monitored for nutrients, heavy metals, fecal coliform and Salmonella.
- *PR and VAR:* Sufficient data must be obtained to demonstrate compliance with PR and VAR standards; temperature monitoring must occur on a daily basis.
- *Maturity testing:* May be required on a case-specific basis.
- *Daily operational records:* Must be maintained for the facility.
- *Annual report:* A detailed report must be submitted.

Specific Requirements for Other OWP Facilities – Biosolids, Mixed Waste, Septage and Sludges (360-5.5)

Section 360-5.5 provides detailed requirements for other types of composting facilities. Compared to yard waste and SSOW facilities, OWP facilities for biosolids, mixed solid waste, septage and other sludges must meet higher standards for design, construction and operation given potential impacts on human health and the environment. Section 360-5.5 is organized into the following subsections:

- Additional application requirements
- Pathogen and vector attraction reduction
- Pollutant limits and product use
- Design and operating requirements
- Monitoring, record keeping and reporting

The requirements of this section also apply to SSOW facilities other than composting facilities, such as anaerobic digestion facilities.

Additional Application Requirements (360-5.5(a))

In addition to the requirements in Section 360-5.4, the engineering report must provide:

- *Feedstock characterization:* biosolids, septage or other sludges
 - Detailed information for each proposed source of waste amendments (sources, quantity, and composition)
 - Analytical results for nutrients, pH, solids, metals, VOCs, acid-base neutral compounds, pesticides, PCBs and cyanide
- *Feedstock characterization:* bulking agents, amendments or admixtures, at NYSDEC discretion

- Analytical results for nutrients, pH, solids, metals, VOCs, acid-base neutral compounds, pesticides, PCBs and cyanide
- *Collection methods:* mixed solid waste
 - Description of the recyclables separation program and household hazardous waste collection program for the proposed service area
- *PR and VAR:* mixed solid waste and waste containing human waste
 - Description of the PR and VAR method (acceptable methods are defined in Section 360-5.5(b), which reflects Federal 503 standards)
 - Monitoring procedures for PR and VAR
 - For existing systems, recent data to demonstrate ability to meet PR and VAR requirements

Design and Operating Requirements (360-5.5(d))

Design and operating requirements in Section 360-5.5(d) address the following:

- *Certificate of construction:* Certification by a licensed engineer that facility was constructed in accordance with the engineering report.
- *Product storage limit:* On-site product storage limited to 24 months.
- *Surface water control:* Surface water diverted away from operating areas.
- *Leachate control:* Waste storage, processing, leachate storage and product storage areas must be constructed to minimize leachate release (i.e., low permeability soils, geomembranes, asphalt, concrete, surface impoundment).
- *Depth to groundwater/bedrock:* At least 5 feet for any leachate impoundments.
- *Leachate handling:* Must be collected and disposed in approved manner (collection and treatment system designed for 10-year 1-hour storm).
- *Odor and dust control:* Facility must be operated in approved manner to control generation and migration of odor and dust.
- *Flood prevention:* Facility must not be constructed on flood plains unless flood control provisions are approved.
- *Separation distances:* At least 500 feet from residences and businesses, with some exceptions that may be approved.
- *Waste disposal:* Noncompostable and nonprocessable waste must be disposed at least weekly in approved manner.
- *Recyclables and HHW:* Facilities handling solid waste must have in place recyclables separation and HHW collection programs; recyclables must be removed prior to active composting.

- *Enclosed operations:* Waste unloading, storage and processing areas must be enclosed for all facilities handling solid waste of 100 tons per day or more total.

In addition, OWP facilities must comply with general requirements for all solid waste facilities contained in Section 360-1.14, which addresses the following issues:

- Surface water and groundwater protection
- Leachate minimization and control
- Restriction of public access
- Control program for unauthorized waste
- Facility maintenance and operation
- Contingency plan
- Monitoring
- Record keeping
- Litter control
- Dust control
- Vector control
- Odor control
- On-site road maintenance
- Noise control
- Open-burning prohibition
- Employee facilities
- Salvaging
- Closure

Pathogen and Vector Attraction Reduction (360-5.5(b))

Any facility that handles mixed solid waste or waste containing human waste must utilize one of the PR and VAR methods described in Section 360-5.5(b).

- *PR standard:* Acceptable PR methods are designated as “Class A” and are equal to Federal 503 standards:
 - Fecal coliform < 1,000 MPN per gram DW; or
 - Salmonella sp. < 3 MPN per 4 grams DW; and
 - Use of a treatment technology defined in Section 360-5.5(b).

- *VAR standard:* Acceptable VAR standards must be met either after meeting or at the same time as meeting PR requirements. Acceptable VAR methods are equal to Federal 503 standards.

Pollutant Limits and Product Use (360-5.5(c))

Products from OWP facilities must meet the criteria of Section 360-5.5(c); otherwise they must be disposed. Section 360-5.5(c) contains the following standards for pollutants and product distribution and use:

- *Feedstock heavy metals limits:* For facilities that handle biosolids, septage or other sludges, each waste source handled at the facility must not exceed specific pollutant concentrations for heavy metals. A waste source may exceed the standards only if it accounts for less than 10% of total dry weight accepted and a program is developed to reduce the pollutant(s).
- *Product heavy metals limits:* Pollutant levels in products must not exceed specific concentrations for heavy metals.
- *Maximum level of contaminants:* Products cannot have more than 2% gross contaminants.
- *Maximum product particle size:* Product particle size must not exceed 10 millimeters, except for wood particles used as bulking agent of amendment in compost.
- *Minimum detention time:* Compost product must come from a process with a minimum 50 days' detention time including active composting and curing.
- *Product maturity:* The NYSDEC may require additional operating conditions to ensure that product is mature.
- *Informational labeling:* Products must be labeled or distributed with information about the producer, the type of waste feedstocks, the metals content, and usage recommendations and restrictions.
- *Product use:* Products may be used for all crops except food crops designated for human consumption. If stored for 38 months or longer, products may be used on food crops. If the product is applied to soil, food crops may be grown on the soil 38 months or more after application.
- *Fertilizer certification:* If marketed as fertilizer, the product must be licensed by the state as such.

Monitoring, Record Keeping and Reporting (360-5.5(e))

Section 360-5.5(e) delineates requirements for monitoring, record keeping and reporting.

- *Feedstock testing:* Each biosolids source or septage source must be analyzed for nutrients, heavy metals, VOCs, acid-base-neutral compounds, pesticides, PCBs and cyanide.
- *Product testing:* Products must be monitored for nutrients, heavy metals, fecal coliform and Salmonella
- *Product testing:* Water quality analysis testing for field parameters, leachate indicators, and inorganic parameters may be required on a case-specific basis.
- *PR and VAR:* Sufficient data must be obtained to demonstrate compliance with PR and VAR standards, as composting facilities temperature monitoring must occur on a daily basis.
- *Maturity testing:* May be required on a case-specific basis.
- *Daily operational records:* Must be maintained for the facility.
- *Annual report:* A detailed report must be submitted.

Monitoring requirements address specific feedstocks (biosolids, septage, other sludges and solid waste) plus product in order to comply with PR and VAR requirements as well as standards for pollutants. The NYSDEC can require maturity testing on a case-specific basis.

Tables (360-5.10)

The following tables are provided that establish specific requirements references in other sections of Part 360-5.

- Parameters for Analysis – Biosolids/Sludge
- Extended Parameters List (VOCs, acid-base-neutral compounds, pesticides, PCBs, metals and cyanide)
- Analyses Required for Permit Application (for Biosolids/Sludge)
- Pollutant Limits – Class B Materials & Input to Class A Facilities
- Cumulative Metal Loading Limits (for product land application)
- Analyses Required During Operations – Biosolids
- Pollutant Limits – Products
- Parameters for Analysis – Biosolids/MSW/Sludge Products

- Annual Product Testing Frequency – Biosolids/Sludge/MSW
- Annual Product Testing Frequency – SSOW
- Annual Product Analyses – Yard Waste Compost
- Analytical Methods and Sample Management

Appendix G – North Carolina

Introduction

North Carolina has well-defined regulatory categories for organics recycling facilities based on feedstock and size. The state also has extensive promotion and development efforts coordinated through its non-regulatory Division of Pollution Prevention and Environmental Assistance (DPPEA). The research and demonstration permit category has helped to encourage organics recycling. This permit is easy to obtain and it encourages people to try different composting technologies. Usually, facilities will apply for a full permit after the Research and Demonstration permit expires. Moreover, North Carolina provides tax incentives for the purchase of equipment and tax exemptions for the land, which are two of the most expensive capital investments of a composting facility.

North Carolina composting regulations are consolidated in *North Carolina Administrative Code Title 15A Subchapter 13B Section .1400 Solid Waste Compost Facilities*. The North Carolina Department of Environment and Natural Resources Waste Management Division (NCDENR) is the regulatory agency for composting facilities. Non-regulatory composting technical assistance is provided by the DPPEA.

Section .1400 is organized into the following sections:

- .1401 Requirement for permit
- .1402 General provisions (including facility classifications and exemptions)
- .1403 General prohibitions
- .1404 Site/design requirements
- .1405 Application requirements
- .1406 Operational requirements
- .1407 Classification/distribution of products
- .1408 Methods for testing and reporting requirements
- .1409 Approval of alternative procedures and requirements

General definitions of solid waste management terminology are located separately in *Title 15A Subchapter 13B Section .0100 General Provisions* of the solid waste management regulations.

Definition of Key Terms

With the exception of “composting pad” and “compost facility” (from Section .0100), all other definitions are embedded in Section .1400.

- “Composting pad” means a surface, whether soil or manufactured, where the process of composting takes place, and where raw and finished materials are stored.
- “Compost facility” means a solid waste facility that utilizes a controlled biological process of degrading non-hazardous solid waste. A facility may include materials processing and hauling equipment; structures to control drainage; structures to collect and treat leachate; and storage areas for the incoming waste, the final products, and residual materials.
- “Type 1 Facility” receives yard and garden waste, silvicultural waste and untreated and unpainted wood waste or any combination thereof.
- “Type 2 Facility” receives pre-consumer meat-free food processing waste, vegetative agricultural waste, source-separated paper or other source-separated specialty wastes, which are low in pathogens and physical contaminants. Waste acceptable for a Type 1 facility may be composted at a Type 2 facility.
- “Type 3 Facility” receives manures and other agricultural waste, meat, post-consumer, source-separated food wastes and other source-separated speciality wastes or any combination thereof that are relatively low in physical contaminants, but may have high levels of pathogens. Waste acceptable for a Type 1 or 2 facility may be composted at a Type 3 facility.
- “Type 4 Facility” receives mixed municipal solid waste, post-collection separated or processed waste, industrial solid waste, non-solid waste sludges functioning as a nutrient source or other similar compostable organic wastes or any combination thereof. Waste acceptable for a Type 1, 2 or 3 facility may be composted at a Type 4 facility.
- “Small Facility” receives less than 1,000 cubic yards of material for composting per quarter, and occupies less than two acres of land, except that a Small Type 1 facility shall process or store less than 6,000 cubic yards of material per quarter.

- “Large Facility” receives 1,000 cubic yards or more of material for composting per quarter or occupies two acres or more of land, except that a Large Type 1 facility shall process or store more than 6,000 cubic yards of material per quarter.

Regulatory Categories of Composting Facilities

- Exempted Facilities
- Research & Demonstration Projects
- Notification Facilities – Small Type 1 Facilities
- Full Permit Facilities

Regulatory requirements for each category are summarized in the following sections.

Exempt Facilities (1402(g))

Certain types of composting facilities are the only ones exempted from regulations in North Carolina. To be exempt, a facility must meet the following requirements.

- *Siting:* Farming and silvicultural operations.
- *Feedstock restriction:* Materials must be grown on owner’s land.
- *Product use restriction:* Compost must be reused on owner’s land or associated operations and not offered for sale to the public.

In addition, school composting projects for educational purposes are exempt if they receive less than 1 cubic yard per week of material.

Research & Demonstration Projects (.1409(b))

Individuals may request approval for a pilot or demonstration project for the purpose of evaluating composting feasibility. Such a request must provide the following information.

- Contact information
- Specific primary waste stream
- Time frame
- Estimated amount of each waste or bulking material
- Basis for operating the project
- Description of testing procedures

- Process description including composting and aeration methods
- Expected final usage or disposal of product
- Outline of a final report to be submitted upon project completion

Notification Facilities (1402(g)(3))

Small yard waste composting facilities are exempt from permit, but must submit a notification form to the NCDENR annually, provided they meet the following requirements.

Small Type 1 Facilities

- *Feedstock restriction:* Yard waste, garden waste, silvicultural waste, & clean wood waste.
- *Size restriction:* Process or store <6,000 cubic yards per quarter and <2 acres of land.
- *Flood protection:* A site in a floodplain shall not restrict flow of 100-year flood or reduce flood storage capacity.
- *Siting:* A site shall conform to the following buffer distances:
 - Property line buffer: at least 50 feet for Type 1 and 2 facilities; 100 feet for Type 3 and 4 facilities
 - Residential buffer: at least 200 feet from occupied dwellings for Type 1 and Small Type 2 and 3 facilities; at least 500 feet for all others
 - Surface water buffer: at least 50 feet from perennial streams/rivers
 - Not sited over a closed disposal site
- *Water supply protection:* At least 100 feet from all wells.
- *Fire fighting access:* At least 25 feet between compost area and swales/berms.
- *Surface water protection:* A site shall not cause discharge of materials to waters or wetlands; violate National Pollutant Discharge Elimination System (NPDES) requirements, or violate water quality standards. Surface water shall be diverted from operational, compost curing and storage areas.
- *Operations:* Comply with general operating requirements in Section .1406 .
- *Fire control:* Safety measures are taken to provide access and prevent fires.

Full Permit Composting Facilities

Application Requirements (.1405)

Applications requirements are dependent on the type of compost facility. Facilities that are larger and handle more putrescible or pathogenic waste must submit more detailed applications.

Type 1 or Small Type 2 or 3 Facility

- *Location map:* Showing area within ¼ mile of site boundaries and identifying:
 - property line
 - location of homes, buildings, wells, roads, utilities, water features and topography
 - land use zoning
- *Zoning approval:* Letter from applicable unit of government.
- *Regulatory compliance:* Explanation of how site complies with siting and design regulations.
- *Engineering report:* A detailed report indicating:
 - Waste characterization including sources and quantities and seasonal variation
 - For sites using natural soil composting pad, a soil evaluation down to 4 feet depth or bedrock or evidence of seasonal high water by a soil scientist
- *Site plan:* A detailed site plan that delineates contours, elevations of water control structures, designated setback buffers, proposed utilities, and operational areas.
- *Operations plan:* A detailed description of how the facility will operate including contact information, personnel list, adverse weather procedures, nuisance control procedures and compost utilization.
- *Design report:* A detailed report on the facility design including design capacity, process flow, measuring and monitoring procedures, materials handling procedures, aeration method, and runoff and leachate control.
- *Product labeling:* Description of information that meets requirements.
- *Equipment information:* List and manufacturing specifications for all equipment.
- *Operations and maintenance manual:* Detailed manual outlining quality assurance plan, contingency plan, and procedures for complying with operations requirements.
- *As-built drawings:* Where applicable.

Large Type 2 or 3 or Type 4 Facility

In addition to the requirements, Large Type 2 and 3 and Type 4 facilities must meet the following application requirements:

- *Site plan:* A detailed site plan that delineates contours, elevations of water control structures, designated setback buffers, proposed utilities, roads and traffic patterns, operational areas, surface and groundwater monitoring locations, floodplains and wetlands, and surveying benchmarks.
- *Operations plan:* A detailed description of how the facility will operate including contact information, personnel list, hours of operation, special waste handling procedures, adverse weather procedures, nuisance control procedures and compost utilization.
- *Design report:* A detailed report on the facility design including design capacity, process flow, storage facilities, contaminant removal and processing procedures, materials handling procedures, measuring and monitoring procedures, aeration method, air emission and control technologies, and runoff and leachate control.
- *Product marketing and distribution plan:* A plan is required but the regulations do not specify what the plan must contain.

Design and Operating Requirements (.1404(a) & .1406)

All permitted composting facilities must comply with the following requirements:

- *Flood protection:* A site in a floodplain shall not restrict flow of 100-year flood or reduce flood storage capacity.
- *Setback buffers:* A site shall conform to the following buffer distances:
 - Property line buffer: at least 50 feet for Type 1 and 2 facilities; 100 feet for Type 3 and 4 facilities
 - Residential buffer: at least 200 feet from occupied dwellings for Type 1 and Small Type 2 and 3 facilities; at least 500 feet for all others
 - Surface water buffer: at least 50 feet from perennial streams/rivers
- *Water supply protection:* At least 100 feet from all wells.
- *Firefighting access:* At least 25 feet between compost area and swales/berms.
- *Surface water protection:* A site shall not cause discharge of materials to waters or wetlands; violate NPDES requirements, or violate water quality standards. Surface water shall be diverted from operational, compost curing, and storage areas.
- *Groundwater protection:* A site shall conform with the following requirements:

- Depth to groundwater: if no impermeable pad is used, at least 12 inches for Type 1 and 2 facilities or 24 inches for Type 3 facilities, and soil texture shall be finer than loamy sand
- Impermeable pad: all Type 4 facilities shall have a pad for waste receiving and storage, active composting, and curing
- *Leachate control:* Leachate shall be contained on-site and treated to standards of off-site disposal method.
- *Access control:* Uncontrolled public access is prohibited; staff shall be on-site during all open hours; the access road shall be all-weather construction; and large sites shall have gates, chains, fences, etc.
- *Erosion and run-off control:* Site must comply with applicable state sedimentation control requirements, and erosion control measures shall prevent on-site erosion and control movement of soils and contaminants from the site. Surface water shall be diverted from contact with waste and compost.
- *Odor control:* Site must comply with applicable state air pollution control requirements and it must be designed to minimize odors at the property boundary.
- *Safety requirements:* Open burning is prohibited and equipment/arrangements for controlling accidental fires shall be in place.
- *Employee training:* All employees shall be trained in safety, and remedial and corrective actions.
- *Signs:* Signs shall be posted stating acceptable wastes, dumping procedures, hours of operation, traffic flow, prohibited materials, etc.

Pathogen & Vector Attraction Reduction (.1406(10)-(12))

Pathogen reduction (PR) and vector attraction reduction (VAR) requirements vary depending on the type of composting facility.

- *Pathogen reduction:*
 - *Type 1:* must achieve temperatures at or above 55 degree Celsius for 3 days and aerated to maintain elevated temperatures
 - *Types 2, 3, and 4:* must achieve temperatures at or above 40 degrees Celsius and averaging higher than 45 degrees Celsius for 14 days or longer
 - *Types 3 and 4:* compost process must qualify as PFRP
- *Vector attraction reduction:* Types 2, 3 and 4 must meet 40 CFR 503 VAR requirements.

Pollutant Standards (.1407)

Compost that is sold, given away or applied to the land cannot exceed any of the values in Table 1, unless the concentrations of all metals are less than the values in Table 2 and records are maintained to show compliance with Federal 503 cumulative and annual loading limits.

Table 1 – Pollutant concentrations 40 CFR 503.13(b)(3)

<i>Metals</i>	<i>mg/Kg DW</i>
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	36
Zinc	2,800

Table 2 – Pollutant ceiling concentrations 40 CFR 503.13(b)(1)

<i>Metals</i>	<i>mg/Kg DW</i>
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Nickel	420
Selenium	100
Zinc	7,500

Monitoring, Recordkeeping, and Reporting (.1406 & .1408)

All permitted composting facilities must comply with the following requirements.

- *Temperature monitoring:* All facilities shall monitor temperature sufficiently to ensure pathogen reduction criteria are met.
- *Recordkeeping:* Daily operational records, analytical results, incoming materials log, processing log, compost product log, compost distribution log.
- *Annual reporting:* Tons received, tons processed, tons of compost produced, tons removed for use or disposal, monthly temperature, compost testing results.

Compost Testing and Use (.1407)

Type 2, 3 and 4 compost facilities must submit compost testing data and obtain a compost grade classification prior to distributing or marketing any compost. Composite samples shall be analyzed for foreign matter, heavy metals, pathogens and total nitrogen (for products containing biosolids).

North Carolina has established the following grades of compost for general distribution and use.

- *Grade A Compost:*
 - *Pathogen reduction:* PFRP
 - *Manmade inerts:* ≤ 6% dry weight basis
 - *Heavy metals:* Table 1 above
 - *Distribution and use:* unlimited, unrestricted distribution and use; may be distributed directly to the public
- *Grade B Compost:*
 - *Pathogen reduction:* not applicable
 - *Manmade inerts:* >6% dry weight basis
 - *Heavy metals:* Table 2 above
 - *Distribution and use:* restricted to land and mine reclamation, silviculture, and agriculture on non-food chain crops
- *Type 1 Facility Compost:* Unlimited, unrestricted distribution and use provided it contains minimal pathogens, is free from offensive odor, and contains no sharp particles.

The regulations specifically state that compost producers must comply with any applicable requirements of the state fertilizer labeling laws if compost is to be marketed as a fertilizer.

Facilities must provide instructions to compost users that include grade classification, recommended uses, application rates, usage restrictions, and total nitrogen (for products containing biosolids).

Appendix H – Virginia

Introduction

Changes in Virginia regulations have come about by a close collaboration between Virginia's Department of Environmental Quality (VDEQ) and the composting industry. Changes have not necessarily increased the number of permitted facilities, but allowed most to operate under the exemptions. This state also requires that facilities test their compost for stability and it has different methods to satisfy this requirement.

Virginia composting regulations are contained primarily in two separate chapters of the state's solid waste regulations. *Title 9 Virginia Administrative Code Volume 20 Chapter 101: Vegetative Waste Management and Yard Waste Composting Regulations (9VAC20-101)* provides expedited procedures for certain composting facilities. *9VAC20-80: Solid Waste Management Regulations* contains the regulations for all other types of composting facilities.

9VAC20-101 (vegetative and yard waste composting) is organized into the following major parts:

- Part I – Definitions
- Part II – Purpose & Applicability
- Part III – Exemptions for Special Vegetative Waste Management Facilities
- Part IV – Standards for All Vegetative Waste Management Facilities
- Part V – Facility Permit by Rule
- Part VI – Enforcement

9VAC20-80 (solid waste management) includes the following parts that are applicable to composting facilities:

- Part I – Definitions
- Part II – General Information
- Part VI – Other Solid Waste Management Facility Standards
 - General (9VAC20-80-320)
 - Compost facilities (9VAC20-80-330)
- Part VII – Permitted of Solid Waste Management Facilities
 - Applicability (9VAC20-80-480)
 - Permits-by-rule and other special permits (9VAC20-80-48)

- Permit application procedures (9VAC20-80-500)
- Part A permit application (9VAC20-80-510)
- Part B permit application requirements for other solid waste management facilities (9VAC20-80-540)
- Recording and reporting requirements (9VAC20-80-570)

VDEQ is the regulatory agency for composting facilities.

Definition of Key Terms

The following definitions found in 9VAC20-80 and 9VAC20-101 describe key terms related to composting.

- “Agricultural operation” means any operation devoted to the bona fide production of crops, animals or fowl including, but not limited to, the production of fruits and vegetables of all kinds; meat, dairy and poultry products; nuts, tobacco, and nursery and floral products; and the production and harvest of products from silviculture activity.
- “Compost” means a stabilized organic product produced by a controlled aerobic decomposition process in such a manner that the product can be handled, stored or applied to the land without adversely affecting public health or the environment.
- “Composting” means the manipulation of the natural aerobic process of decomposition of organic materials to increase the rate of decomposition.
- “Decomposed vegetative waste” means a stabilized organic product produced from vegetative waste by a controlled natural decay process in such a manner that the product can be handled, stored or applied to the land without adversely affecting public health or the environment.
- “Decomposition of vegetative waste” means a controlled natural process, active or passive, which results in the decay and chemical breakdown of vegetative waste.
- “Mulch” means woody waste consisting of stumps, trees, limbs, branches, bark, leaves and other clean wood waste that has undergone size reduction by grinding, shredding or chipping, and is distributed to the general public for landscaping purposes or other horticultural uses except composting.

- “Vegetative waste” means decomposable materials generated by yard and lawn care or land clearing activities and includes, but is not limited to, leaves, grass trimmings, woody wastes such as shrub and tree prunings, bark, limbs, roots and stumps.
- “Yard waste compost” means a stabilized organic product produced from yard waste by a controlled aerobic decomposition process in such a manner that the product can be handled, stored and/or applied to the land so that it does not pose a present or potential hazard to human health or the environment.

Regulatory Categories of Composting Facilities

- General Exemption Facilities
- Permit by Rule Facilities
- Full Permit Facilities

Composting facilities are classified according to the general process used.

- “Type A” facilities employ in-vessel method.
- “Type B” facilities employ windrow or static pile method. Facilities that employ piles for stabilization or curing are also classified as “Type B” even if in-vessel active composting is used.

Compost facilities are further classified according to the types of feedstock used.

- “Category I” – pre-consumer plant or plant-derived materials and source-separated clean paper
- “Category II” – animal-derived waste material
- “Category III” – animal and post-consumer food wastes with pathogen potential
- “Category IV” – other wastes including biosolids, mixed solid waste, and non-rendered meat waste

General Exemption Facilities

Agricultural Composting of On-Site Vegetative Waste (20-101-60.3)

- *Siting:* Composting area is ≥ 300 from property boundary; $\geq 1,000$ from occupied dwellings off-site; and not located in a floodplain.
- *Site size:* At least 1 acre of suitable ground for each 150 cubic yards per year of finished compost.
- *Feedstock restriction:* Vegetative and yard waste generated on-site.
- *Time restriction:* Total time for composting and storage does not exceed 18 months.
- *Product use restriction:* All product is used on-site.
- *Environmental protection:* No nuisance or threat to public health and the environment.

Agricultural Composting of Off-Site Vegetative Waste (20-101-60.4)

- *Siting:* Composting area is ≥ 300 feet from property boundary; $\geq 1,000$ feet from occupied dwellings off-site; and not located in a floodplain.
- *Site size:* At least 1 acre of suitable ground for each 150 cubic yards per year of finished compost.
- *Feedstock restriction:* Vegetative and yard waste only; and $< 6,000$ cubic yards per year of yard waste from off-site.
- *Time restriction:* Total time for composting and storage does not exceed 18 months.
- *Certification letter:* Owner submits certification letter that includes contact information, site information, and certifications that the site and operations comply with applicable restrictions.
- *Annual report:* If the facility receives $> 6,000$ cy/yr from off-site, owner must submit annual report to VDEQ describing volume and type of yard waste received.
- *Environmental protection:* No nuisance or threat to public health and the environment.

Yard Waste Composting (20-101-60.5)

- *Feedstock restriction:* < 500 cubic yards per year of yard waste from off-site.
- *No tip fee:* No compensation will be received from parties providing yard waste.
- *Environmental protection:* No nuisance or threat to public health and the environment.

Mulching Facilities (20-101-60.6)

All mulching operations are exempt from solid waste regulation provided the mulch is reclaimed or temporarily stored incidental to reclamation and is not accumulated speculatively and is managed without creating an open dump, hazard or a public nuisance.

Educational Composting (20-80-60.E)

Size restriction: ≤5 tons of materials on-site at any time; large amounts are possible with VDEQ pre-approval.

Research Projects (20-80-485.C)

VDEQ may issue an experimental facility permit for a composting facility that proposes to use an innovative or experimental technology or process. Permit conditions generally will assure protection of public health and the environment, and specifically address the following.

- *Feedstock & size restriction:* Limited to what is minimally necessary to determine efficiency and performance of technology and its impacts.
- *Other requirements:* Operation, testing, monitoring, reporting, closure and remedial actions shall be written into the permit as the VDEQ deems necessary.
- *Design and operating requirements:* Must comply with applicable requirement for miscellaneous operations including public health and environmental protection, siting, and prevention of environmental releases.
- *Time restriction:* Facility shall not operate for more than 1 year unless permit is renewed; maximum of 3 renewals.
- *Certifications:* Must comply with applicable regulations for local certification, disclosure statement, financial responsibility and public participation.

Permit by Rule Facilities

A permit by rule facility is deemed to have a permit if it meets the requirements of the regulations.

Vegetative Waste Composting Facilities

Non-exempt vegetative waste composting facilities, including yard waste composting facilities, are eligible for permit by rule provided they meet the following general requirements (20-101-30 & 20-101-140.A):

- *Feedstock restriction:* Source-separated vegetative waste and agricultural residues including manures and animal bedding.
- *Site restriction:* Not atop a partially or fully closed waste disposal facility.

Vegetative waste management facilities must comply with the following specific requirements:

Application Requirements (20-101-160)

The owner or operator of a vegetative waste composting facility must submit the following information to the VDEQ in order to be deemed to have a permit (permit by rule):

- *Legal control of site:* Demonstrate legal control (ie., ownership) of site.
- *Notify VDEQ:* Notify the VDEQ of intent to operate facility.
- *Certifications:* Compliance with local ordinances, compliance with design requirements, certification by professional engineer.
- *Operations plan:* Demonstrate compliance with operating requirements.
- *Distribution and marketing plan:* Describing procedures.
- *Closure plan:* Demonstrate compliance with closure requirements.
- *Financial assurance:* Where applicable, provide documentation in conformance with state requirements.

Design and Operating Requirements (20-101-120, 130 & 140)

Vegetative waste composting facilities must comply with the following siting, design and operating requirements.

- *Siting restriction:*
 - >50 feet from any regularly flowing stream
 - Not located in geologically unstable areas
 - >200 feet from any dwelling, health care facility, school or public institution
 - \geq 100 feet separation between process operations and facility boundaries

- Facilities located atop closed waste disposal sites must comply with specific requirements, including preventing hazards to public health and the environment and amending any existing permits or closure plans
- *Waste segregation:* An area and equipment must be provided to separate and properly handle vegetative waste from other wastes.
- *Impermeable surface:* If seasonal high groundwater is <24 inches below surface, waste handling and composting areas shall be on a hard surface with runoff and leachate control structures.
- *Engineering controls:* Shall be incorporated for springs, groundwater intrusions and utility lines.
- *Surface water control:* Facility must be graded to prevent run-on and control run-off.
- *Leachate control:* Leachate and other runoff shall drain or discharge directly to surface waters.
- *All weather access:* Roads shall be usable under all weather conditions.
- *Waste containment & disposal:* Non-vegetative waste must be segregated and promptly removed from the site; it must be stored in containers; putrescible waste removed within 7 days; nonputrescible waste removed within 30 days.
- *Access control:* Public access shall be permitted only when an attendant is on duty.
- *Dust, odor, & vector control:* These must be controlled so they do not cause a nuisance or hazard.
- *Safety & fire prevention program:* Must be prepared, implemented and enforced; open burning is prohibited.
- *Closure:* Facility must have a written closure plan; it must be closed in a manner that minimizes further maintenance; all materials must be removed from site; closure must be completed within 12 months after receiving final volume of waste.

Other Composting Facilities (20-80-485.A.4)

Any other composting facility is deemed to have a solid waste permit if it meets the following requirements.

- *Size restriction:* Receives ≤ 700 tons per quarter of compostable materials (Category I – IV).
- *Notification:* Notifies VDEQ of intent to operate in accordance with regulatory requirements.
- *Siting:* Certifies compliance with applicable composting facility siting requirements.

- *Design & construction:* Certifies compliance with applicable composting facility design and construction standards.
- *Operations:* Certifies compliance with applicable composting facility operating requirements.
- *Closure:* Certifies compliance with applicable composting facility closure requirements.
- *Public notice & participation:* Publish a public notice regarding intention to construct and operate facility; allow for public review and comment; hold public meeting.

Full Permit Facilities

All other types of composting facilities, namely large composting and co-composting facilities, must obtain a solid waste management facility permit. Applicable regulations include the following:

- 80-320 – General requirements
- 80-330 – Compost Facilities
 - General
 - Siting
 - Design/Construction
 - Operations
 - Closure
- 80-500 – Application procedures
- 80-510 – Part A permit application requirements
- 80-540 – Part B permit application requirements
- 80-570 – Recording and reporting requirements

The following paragraphs summarize regulatory requirements for full permit composting facilities.

Application Requirements (20-80-500, 510 & 540)

Composting facility permit applications must comply with the following requirements. Application must be made in two phases. Part A application provides the information to determine site suitability. Upon receiving site approval or conditional approval, the applicant can submit Part B application, which contains the detailed engineering design and operating plans for the facility.

- *Notice of Intent*: Must be filed with VDEQ.
- *Compliance with local ordinances*: Must be documented in the Notice of Intent.
- *Site suitability*: Part A application shall include location map, legal control of site, aquifers and geological features, and consistency with solid waste plan.
- *Design and operations plan*: Part B applications shall include detailed design plans by registered engineer, design report, operations manual, emergency contingency plan, and closure plan.

Design and Operating Requirements (20-80-330.B, C, & D)

- *Siting restriction*:
 - >50 feet from any regularly flowing stream
 - >200 feet from any dwelling, health care facility, school or public institution
 - Adjacent to or direct access to roads with adequate load limits
 - ≥ 50 feet separation between process operations and facility boundaries
 - Type B facilities not located in geologically unstable areas
 - Type B facilities not located in area where < 2 feet to seasonal high groundwater
- *Enclosed operations*: Facilities composting MSW shall have covered areas for receiving, and separating MSW.
- *Impermeable surfaces*: Category IV facilities and facilities handling >700 tons per quarter of Category I, II or III material shall provide impermeable surface for operations.
- *Storm water calculations*: Uncovered sites shall be designed for 10-year 1-hour storm.
- *Waste segregation*: An area and equipment must be provided, and noncompostable waste must be separated and properly disposed.
- *Engineering controls*: At Type B facilities, shall be incorporated for springs, groundwater intrusions and utility lines.
- *All weather access*: Roads shall be usable under all weather conditions.
- *Back-up power*: Or other arrangements to ensure continuity of operations.
- *Operations plan*: Prepare and maintain a detailed operations plan including description of wastes, composting process, testing, schedule of operations, etc.
- *Closure*: Facility must have a written closure plan; facility must be closed in a manner that minimizes further maintenance; all materials must be removed from site; closure must be completed within 6 months after receiving final volume of waste.

Pathogen & Vector Attraction Reduction (20-80-330.D.2.b)

- *Pathogen reduction:* Finished compost must comply with all of the following standards:
 - Parasites: no viable Ascaris ova
 - Bacteria: <1 MPN Salmonella per gram dry solids
 - Fecal coliform: <10 MPN fecal coliform per gram dry solids
- *Vector attraction reduction:* VAR requirements are applied only to facilities that handle biosolids, in which case Health Department regulations are utilized that parallel Federal 503 standards

Pollutant Standards (20-80-330.D.2.c)

All finished product from Category IV material composting facilities must not exceed the following levels for heavy metals:

Table 1 – Pollutant concentrations

<i>Metals</i>	<i>mg/Kg DW</i>
Arsenic	41
Cadmium	21
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	28
Zinc	2,800

Monitoring, Recordkeeping and Reporting (20-80-330 & 570)

Facilities must complete all monitoring and retain all records required in their permit. Operational records shall include temperature data, quantity of materials processed, self-inspection log and all monitoring information. Facilities must comply with the following reporting requirements: notice of planned alterations to facility and report all noncompliance or unusual conditions.

Compost Testing and Use (20-80-330.D)

All permitted compost facilities shall test compost for stability. Category III and IV material composting facilities shall test compost for pathogens. Category IV material composting facilities shall test compost for heavy metals.

Compost meeting the applicable standards for pollutants and stability are eligible for distribution and use by the general public.