

Regulatory Options for Composting Operations in Vermont

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April 2008

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I. Introduction

In light of the current status of Vermont's compost regulations, a variety of choices exist for implementation of policies to address environmental concerns while also encouraging the economic success of composting. A recent survey of state composting regulatory schemes notes that many states "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."¹ This report provides a basic explanation of the available options and suggests how these options could be applied in Vermont.

Characteristics and Goals of Regulatory Agency

Under Vermont solid waste law, the goal of the regulations should be to: "establish procedures and standards to protect public health and the environment by ensuring the safe, proper, and sustainable management of solid waste,"² to provide financial assistance to "defray the major cost of complying,"³ and to provide resources "to education and technical assistance... to improve the management of ... wastes and protect water quality."⁴ An approach that identifies the goals of the regulation is essential so that effective guidance may be provided to the agency responsible for implementation and compliance with the policy.

II. Recommendations for Vermont

1. Establish a range of regulatory requirements with increasing levels of public process, regulatory oversight and stringency of regulatory standards tiered to reflect the increasing levels of risk associated with the nature of the composting operation. By increasing the methods of certification from three to four, more gradations in the level of regulation enable the appropriate amount of oversight for different types of composting. This new certification would be a reduced procedure for facilities posing low risk. The options would range from complete exemption for household backyard composting operations at the low risk end of the spectrum to full solid waste certification at the other end of the spectrum for composting of sewage sludge. Facilities in between those two extremes would be regulated through notification, registration, permit-by-rule, or categorical certification.
2. In conjunction with adding a greater range of regulatory options, Vermont should establish a set of criteria which can be used to classify composting facilities to accommodate more types of operations and scales of production. The new classifications would be based on a combination of feedstocks⁵ and facility size and would enable the adjustment of the level of regulation to relative risk of the composting activities. Refining

¹ Kessler Consulting, Inc. August 2006. F.O.R.C.E. Florida Composting Regulatory Report. p. 9. (F.O.R.C.E.)

² Vermont Solid Waste Management Rules, Effective June 12, 2006, §6-102 (V.S.W.M.R.)

³ Agriculture Water Quality - General Provisions, 6 V.S.A. §4801(1) (2007) Purpose; state policy

⁴ Id.

⁵ Feedstocks are the organic materials used as inputs in composting. EPA, 1995. Decision Maker's Guide to Solid Waste Management – Vol. II., Chapter 7: Composting. (EPA 530-R-95-023). p. 7-9.

and expanding upon feedstock definitions would allow application of a range of regulatory classifications based upon the various types of organic materials being composted. Also, consider utilizing cubic yards, as a metric, rather than tons (dry weight) to demonstrate compliance to increase reporting efficiency.⁶

3. Re-appraise the requirements for each type of certification to evaluate the effectiveness of regulation in achieving the dual purpose of environmental protection and zero waste policies. Assess the permitting procedures to determine whether application components adequately and appropriately control the siting, design, operation, testing, record-keeping, and reporting requirements commensurate to the level of risk posed by classes of compost facilities.

III. Overall Findings

1. A survey of other state regulatory programs reveals variations in classification of facilities and associated regulatory requirements that make it possible to carefully tailor regulations to the level of environmental risk. Compared to Vermont, most states have at least one additional tier of regulation available as a regulatory tool and some have more.
2. Definitions for feedstocks, methods, and characteristics utilized by many other states are more robust than those found in Vermont's Solid Waste Management Rules §6-1102. For example, most differentiate food waste between vegetative-only and meat-containing, while Vermont does not. Source-separated organic material is not defined in Vermont's rules.⁷
3. Composting method and the technology utilized need not be part of a classification scheme. Environmental concerns about particular processes may be addressed through testing requirements⁸ for compost stability,⁹ siting requirements for odors and nuisance issues,¹⁰ and operational requirements for safety.
4. Source-separation of organic material supplies a feedstock for composting operations with less risk of adverse environmental impacts,¹¹ provides the highest value added compost product,¹² and therefore merits reduced regulatory requirements.

⁶ "Current regulatory issues of concern to [composters] include: ... disclosure of proprietary formulas [which] could compromise a composter's market advantage... [and] [t]racking this information is a significant burden." Composting Association of Vermont, August 23, 2007. Vermont Compost Facility Permitting Project: Legal Compost. p. 2.

⁷ 10 V.S.A. §6622 (2007) provides some guidance on definitions for "source separation" and "compostable".

⁸ Hogg, Dominic, et al. 2002. "Comparison of Compost Standards within the EU, North America, and Australasia," The Waste and Resources Action Programme. (W.R.A.P.). p. 39.

⁹ "Stabilized refers to the condition of waste in which it no longer undergoes physical, chemical, or biological changes spontaneously." Vermont Solid Waste Management Rules §6-201.

¹⁰ "Most countries appear to deal with odour and nuisance issues (such as they are likely to arise) through planning and licensing regimes." W.R.A.P at p. 22.

¹¹ Gould, Mark, et al. 1992. "Source Separation and Composting of Municipal Solid Waste," *Resource Recycling*, July 1992. Also see: Brinton, William F., Wood's End Research Laboratory, Compost Quality Standards and Guidelines, December 2000, p. 9.

¹² EPA, Decision Maker's Guide to Solid Waste Management, Chapter 7. p. 7-16.

5. Mixed solid waste and bio-solids contain higher elements of heavy metals and pathogens, and operations that receive these feedstocks should have the most stringent level of regulation as well as product testing requirements to ensure safety and quality.¹³

IV. Scope of Research and Report

An analysis of composting regulations in other states reveals common frameworks that are useful in considering the options available to Vermont's regulatory and composting communities. These options vary in terms of the structure of the control mechanisms, the thresholds triggering categorization classifications of the categories, and the requirements for obtaining a permit. An in-depth analysis of the complete interface between land use, solid waste, and agricultural regulations is beyond the scope of this report. Introduction of a more sophisticated and tiered approach to compost regulation may provide a basis for eliminating or reducing some of the regulatory burden associated with other statutes. For example, an exemption to Act 250 for lower environmental risk composting facilities may be realized without removing land use review of aspects of environmentally riskier operations.

This report benefits from the availability of a recently published analysis of state regulatory frameworks for the Florida Organics Recycling Center for Excellence (F.O.R.C.E.). The F.O.R.C.E. report method of analysis and summary of state regulations¹⁴ are frequently cited and provide a base of useful information which is used in this report. The reader is encouraged to view this report in its entirety, included as Appendix A. Analyses of additional states have been performed to complement the findings of the aforementioned F.O.R.C.E. report.¹⁵ In addition, the Waste and Resources Action Programme of the United Kingdom has published a Comparison of compost standards within the EU, North America, and Australasia.¹⁶ This publication also provides guidance for implementation of progressive regulation because it includes findings from 18 other countries with more-developed and successful organics diversion programs and markets for compost.

V. Vermont's Regulatory Scheme as it Relates to Compost

While composters in Vermont are subject to a variety of regulatory regimes, the primary agency responsible for their oversight is the Agency of Natural Resources ("ANR"). The Solid Waste Division¹⁷ of the ANR's Department of Environmental Conservation has promulgated the Solid Waste Management Rules ("SWMR" or "the Rules"), pursuant to its authority,¹⁸ to "establish procedures and standards to protect public health and the environment by ensuring the

¹³ W.R.A.P. at p. 35.

¹⁴ The seven states selected for regulatory review "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." F.O.R.C.E. at p. 1.

¹⁵ Additional states, provinces, and countries researched include: New Hampshire, Connecticut, Washington, Oregon, Minnesota, Wisconsin, British Columbia, Nova Scotia, New Brunswick, England and Scotland.

¹⁶ Hogg, Dominic, et al. 2002. "Comparison of Compost Standards within the EU, North America, and Australasia," The Waste and Resources Action Programme. (W.R.A.P.). Included as Appendix G.

¹⁷ "Solid waste management facilities, include... composting or other processing or treatment." V.S.W.M.R. §6-301(a).

¹⁸ "The secretary shall have the power to [a]dopt, amend and repeal rules pursuant to chapter 25 of Title 3 implementing the provisions of this chapter." 10 V.S.A. §6603 (2007).

safe, proper, and sustainable management of solid waste in Vermont.”¹⁹ These rules provide for three potential methods of compliance: exemption from Solid Waste permitting, categorical certification as a compost operation, or obtaining a full solid waste permit. In comparison to other states, the State of Vermont has a relatively unsophisticated regulatory structure for composting operations under its Solid Waste Management Rules.²⁰

Vermont’s land use program, also known as Act 250, has recently been deemed to apply to certain composting facilities.²¹ In certain cases, creating compost for sale is considered commercial, rather than agricultural, and therefore under the ambit of “development ... for commercial... purposes”²² and subject to Act 250 jurisdiction. *See, In Re: Richard and Marion D. Josselyn*, Declaratory Ruling #333, Findings of Fact, Conclusions of Law and Order (Vt. Env. Bd. Feb. 28, 1997) (on-site preparation and sale of horticulture products on a farm constitutes "farming.") and Natural Resources Board District Commission #4, Jurisdictional Opinion #4-207 (Reconsideration 2) (Intervale Compost Products). Whether, the farming exemption²³ to Act 250 applies to composters depends on whether two operative tests are met: (1) is the compost operation is considered a farm;²⁴ (2) and has the 51% rule has been met?²⁵ Recent legislative activity²⁶ suggests that the legislature may create an exemption from Act 250 for composting operations.²⁷ The efficacy of the new exemption would be enhanced by its selective application to restructured solid waste categorical classifications. In other words, Act 250 regulation should also be part of the tiered method of regulation with the exemption reserved for the lower risk operations, leaving higher environmental risk facilities subject to the full measure of Act 250 permitting.

The statute which enables the ANR to regulate composting categorically, 10 V.S.A. §6605(c), provides all of the necessary authorizations to enact provisions which protect the environment:

- (c) Certifications for a solid waste management facility ... *where appropriate* shall:
 - (1) Specify the location of the facility, including *limitations on its development*.
 - (2) *Require proper operation and development* of the facility in accordance with facility management plans approved under the certificate.

¹⁹ Vermont Solid Waste Management Rules §6-102.

²⁰ See Overall Finding #1 above.

²¹ Composting Association of Vermont, Vermont Compost Facility Permitting Project: Legal Compost, August 23, 2007, p.1. See also Page, Candace, “Intervale Compost to Close”, Burlington Free Press, February 28, 2008 and Hallenbeck, Terri, “Composter Must Obtain Permit”, Burlington Free Press, January 25, 2008.

²² 10 V.S.A. §6001(3)(A)(i)

²³ 10 V.S.A. §6001(3)(D)(i),

²⁴ 10 V.S.A. §6001(22)(E) states, “the on-site storage, preparation and sale of agricultural products principally produced on the farm” meets the definition of farming. This provision has been deemed the one most appropriate to composting operations by many of the District Commissions.

²⁵ Scott Farm DR #413 Findings of Fact, Conclusions of Law, and Order January 16, 2003. “[T]he "principally produced" requirement can be satisfied *if the majority of the weight or volume of the ingredients in the finished product comes from [the] Farm*. Thus, even if the *primary* ingredient in the finished product does not come from [the] Farm, as long as most of the ingredients do, the product, and, more importantly for purposes of this case, *the process by which it is made*, fits the "farming" exemption of the statute.”

²⁶ H. 873, An Act Relating to the Cleanup of Lake Champlain and Other State Waters, has been introduced during the 2007-2008 session.

²⁷ Notably, there is a lack of clear guidance on how much of the finished product must be used on the farm, as opposed to sold commercially, for the exemption to apply.

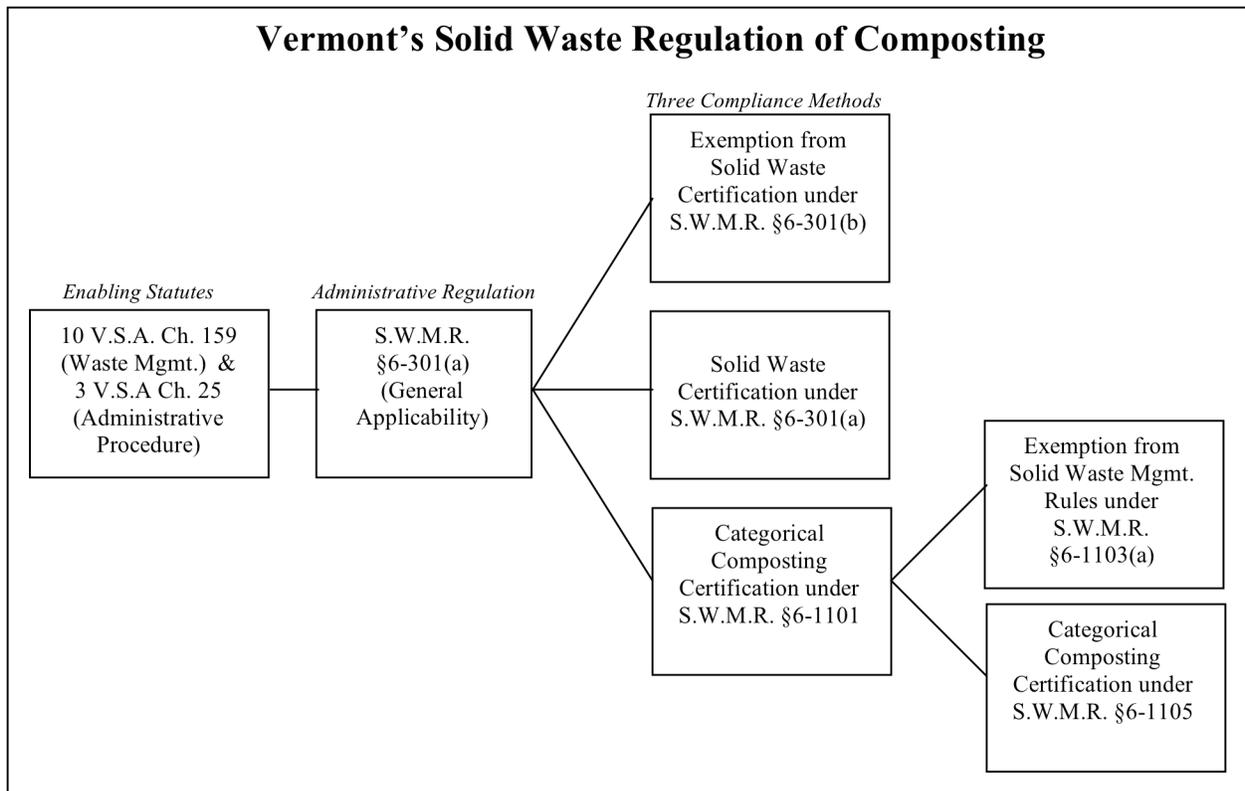
- (3) Specify the projected amount and types of waste to be managed or disposed at the facility.
- (4) Contain additional conditions, requirements, and restrictions, as the secretary may deem necessary to preserve and protect the public health and the air, groundwater, and surface water quality. This may include requirements concerning recording, reporting, and inspection of the operation of the facility.

10 V.S.A. §6605(c) (2007). [emphasis added]

An administrative rulemaking procedure that updated the Solid Waste Management Rules would not require any legislative action to commence. In order to provide guidance for an update to the rules, an analysis of the existing regulations follows.

a. Options Currently Available in Vermont

These rules provide three methods of compliance for composting operations: exemption, categorical composting certification, or solid waste certification. V.S.W.M.R. §6-301(b) [exemption], §6-1101 [categorical composting certification], §6-303 [solid waste certification], respectively. The solid waste certification is organized as a default requirement and the categorical composting certification is intended to be a sub-set within the solid waste regime (6-303). The categorical certification has a streamlined permitting process and fewer substantive compliance requirements compared to full solid waste certification.



Within the solid waste regulations, there are two areas of exemption for composters. Both are utilized as thresholds under which a facility is deemed to be too minor to require certification. The first is an exemption from solid waste certification generally and the second is an exemption from a categorical composting certification. The solid waste certification exemption route applies to yard and wood waste generated and processed on-site (6-301(b)(1)), “small volumes of less

than one cubic yard of waste” with benign characteristics (6-301(b)(3)), “sludge management facilities located at wastewater treatment plants” (6-301(b)(9), and some animal burial situations (6-301(b)(13-17)). In addition, the following composting activities are eligible for categorical composting certification exemption:

- (1) Composting of animal manure and absorbent bedding used for soil enrichment;
- (2) Composting of site-generated plant, wood, or food waste;
- (3) Composting of one (1) ton or less (dry weight) per year of off-site generated plant, food, or wood waste;
- (4) Composting of one (1) ton or less (dry weight) per year of site-generated compostable animal offal and carcasses in addition to any necessary amount of approved high carbon bulking agent up to a limit of 10 tons (dry weight); and
- (5) On site composting, on a farm of ten (10) or more acres in size, of any amount of site-generated compostable plant or food waste, less than 5 tons (dry weight) per week of site-generated compostable animal offal and carcasses in addition to any necessary amount of approved high carbon bulking agent up to a limit of 50 tons (dry weight), and less than 5 tons (dry weight) per year of off-site generated compostable plant or food waste.

V.S.W.M.R. §6-1103(a)

Categorical certifications are required for the following composting activities:

- (1) Composting of more than one (1) tons (dry weight) of plant and wood waste from off-site per year;
- (2) On site composting, on a farm of ten (10) or more acres in size, or other composting operations specifically approved by the Secretary either of which incorporate in addition to any amount of plant and wood waste, any amount of site-generated food waste, and any amount of approved high carbon bulking agents, the following:
 - (A) Seven (7) tons (dry weight) or less, per week, of food waste from off-site; and
 - (B) Seven (7) tons (dry weight) or less, per week, of animal offal and carcasses from on or off-site.

V.S.W.M.R. §6-1105(a)

“Composting of any amount of septage and/or sludge does not qualify for a categorical certification.” V.S.W.M.R. §6-1105(b). A solid waste certification is required for facilities with operations that exceed the categorical thresholds or which accept septage or sludge; and everything that does not qualify for the solid waste exemption or categorical composting certification.

Vermont's Certification Thresholds

Exempt	Categorical Composting Certification	Solid Waste Certification
<p><i>Under §6-301(b):</i></p> <ul style="list-style-type: none"> • Site-generated trees, stumps, yard waste, and wood chips • < 1 cy of yard waste • Sludge (biosolids) at a Wastewater Treatment Facility <p><i>Under §6-1103(a):</i></p> <ul style="list-style-type: none"> • Animal manure and absorbent bedding used for soil enrichment • Site-generated plant, wood, or food waste • < 1 ton* / year off-site generated plant, food, or wood waste • < 1 ton* / year site-generated animal offal and carcasses <u>plus</u> < 10 tons* bulking agent on a farm > 10 acres: <ul style="list-style-type: none"> ○ any amount site-generated plant or food waste, ○ < 5 tons* / week (260 tons / year) site-generated animal offal and carcasses <u>plus</u> < 50 tons bulking agent ○ < 5 tons* / year off-site generated plant or food waste 	<p><i>Under §6-1105(a):</i></p> <ul style="list-style-type: none"> • > 1 ton* / year off-site generated plant and wood waste on a farm > 10 acres or an operation approved by the secretary: <ul style="list-style-type: none"> ○ any amount plant and wood waste ○ any amount site-generated food waste ○ any amount bulking agents ○ < 7 tons* / week (364 tons / year) off-site generated food waste ○ < 7 tons* / week (364 tons / year) animal offal and carcasses 	<p><i>Under §6-301(b) & §6-1105(b):</i></p> <ul style="list-style-type: none"> • septage and/or sludge (biosolids) <p><i>Under §6-301(a):</i></p> <ul style="list-style-type: none"> • > 7 tons* / week (364 tons / year) off-site generated food waste • > 7 tons* / week (364 tons / year) animal offal and carcasses • Any amount Municipal Solid Waste
<p><i>*Note: tons are dry weight</i></p>		

b. Analysis

The Solid Waste Management Rules utilize the concepts that other states use, but to a limited extent. Composters in Vermont are categorized by feedstock and size. The controlling feedstock types are yard waste, food waste, and animal carcasses. Consideration is provided to whether the feedstock originates either on- or off-site, and the size of the facility is evaluated by weight (dry) per week.

The metric utilized in the rules, however, merits re-evaluation. Of the seven states analyzed in FORCE report, all used thresholds significantly higher than Vermont's. The SWMR's threshold for requiring a full permit for food wastes is significantly lower, and hence more stringent, than all of the other states studied in the F.O.R.C.E. report, except for California which requires any facility receiving food waste to obtain a full solid waste certification. Two states, New York and New Jersey, don't require full solid waste certification for food wastes. A comparison of food waste thresholds, which illustrate how source separated organics are regulated, is found in the table below. The table compares the thresholds other states utilize in requiring a full solid waste certification:

Comparison of Thresholds for Full Solid Waste Certification for Food Waste Feedstocks^α		
<u>State</u>	<u>Threshold</u>	<u>Converted to Weekly^χ</u>
California	Any amount	
Maine	> 400 cy / month ^δ	> 41 tons / week
Massachusetts	> 20 tons / day	> 140 tons / week
New Jersey	No amount (eligible for reduced procedures)	
New York	> 1000 cy / year (eligible for reduced procedures, < 1000 cy / year eligible for registration)	
North Carolina	> 1000 cy / quarter	> 34 tons / week
Virginia	> 700 tons / quarter	> 53 tons / week
Vermont	> 7 tons / week	> 7 tons / week

^α The thresholds for this comparison are taken from the F.O.R.C.E. report pages 13-16 and the Vermont Solid Waste Management Rules.

^β The food wastes conversion factor for cubic yards to tons is 0.45 based upon the Vermont Department of Environmental Conservation's *Categorical Composting Facility Annual Report* form, Table 3.

^χ The various jurisdictions use different time frames for evaluating the amount of food waste composted. The thresholds have been converted to match Vermont's weekly metric. Months are converted to weeks by a factor of 52/12 or 4.33.

^δ Maine considers "Food By-product" to be a Type IB residual because its Carbon : Nitrogen ratio is approximately 15. Maine Solid Waste Management Rules, Chapter 409 Appendix A. If one were to consider seafood or meat wastes as food waste, then the corresponding classification would be Type IC due to its lower Carbon : Nitrogen ratio. In that case, the threshold for requiring a full solid waste certification would be half, or > 200 cy / month = 90 tons / month = 20 tons / week.

The combination of having only one reduced-procedure certification option, and a relatively lower ceiling on its applicability, potentially subjects some composters to more regulation than is necessary to meet the regulatory goals. The two major concerns with compliance are: (1) the process that composters must follow, and (2) the substantive requirements of obtaining and operating within the conditions of the permit. Procedurally, applying for a permit requires regulatory approval, subject to siting limitations, and a provision is made for public notice. Substantively, the required disclosures include: site plans; a management plan; notice to adjoining landowners and local municipality; a letter demonstrating conformity to the local solid waste plan; annual reporting; and operational requirements such as pathogen sanitization, finished product stability and consistency, heavy metal testing, and record keeping. A tiered system of regulatory requirements would enable both variables, amount of process and permit requirements, to be tailored to the environmental risk associated with new classifications. To provide context for the evaluation of these policies, a survey of the regulations of other states provides points of comparison and also as a source of suggestion.

VI. Compost Regulations in Other States

a. F.O.R.C.E. Report

The Florida Organics Recycling Center for Excellence (F.O.R.C.E.) recently commissioned a study titled, the Florida Composting Regulatory Report. Consultant Mitch Kessler authored the report, which "provides an analysis of and recommendations for solid waste regulations for organics recycling facilities for the Florida Department of Environmental Protection,"²⁸ in August 2006. Its "scope is limited to organics recycling facilities regulated under solid waste rules"²⁹ and "does not include biosolids (municipal wastewater sludge) when

²⁸ F.O.R.C.E. at p. 1.

²⁹ Id.

their treatment and beneficial use are regulated under separate rules (e.g., residuals management or wastewater regulations).”³⁰ The purpose of the report was to “help establish ... composting regulations that further enhance diversion and proper management of organic wastes and diversification of the recycling industry in Florida.”³¹

The F.O.R.C.E. report’s methodology was to, first, “select states for regulatory review... based on general knowledge of their efforts to promote organic waste diversion while promoting public health and the environment.”³² Next, the report “[r]eviews and analyze[s] state composting regulations... with regard to: regulatory categories..., siting design, and operating requirements for each category of facility, pathogen reduction and vector attraction reduction requirements, heavy metal standards, and compost utilization requirements.”³³ Kessler Consulting “[i]nterview[ed] composting regulatory personnel... to determine: proper understanding of their regulations, history of regulatory development, how the regulations have been developed to enable organics recycling, and what barriers the regulations pose to organics recycling.”³⁴ The final step in creating the F.O.R.C.E. report was to “[o]btain input from the Florida organics recycling industry” and “develop conclusions and recommendations.”³⁵ The recommendations for the state of Florida include a summary of regulatory classifications, shown graphically, and this presentation of categorizations illustrates a framework helpful in Vermont’s self-evaluation. Appended to the F.O.R.C.E. report are summaries of the states analyzed and these provide more details about specific state policies.

b. Regulatory Options

The major variables in a regulatory structure and the permutations of their inter-relationship enable vast opportunities for crafting regulations that meet the political and economic needs of the state. By exploring each of these mechanisms, a solution that incorporates the desirable aspects may be obtained. The major variables are briefly introduced, and then are more extensively discussed.

Classification of Facility

Entities that utilize composting as part of their operations may be classified in a variety of ways. The most common method of classification is by the combination of feedstock type and size of operation. It is very important to define feedstocks in a manner that alleviates confusion. Two approaches for achieving effective feedstock definitions are (1) to define them inclusively³⁶ through definitions that list all materials within a category (as opposed to listing excluded items), and (2) by resorting to characteristics of the feedstock such as carbon to nitrogen ratio.³⁷ The size is also compared relative to a time period or acreage of facility utilized. The sliding scale of volume of material can be effectively used to tailor the classification scheme to meet the goals of the regulation which are generally to ensure that the more significant environmental public health risks are given a greater level of regulatory scrutiny.

³⁰ Id.

³¹ Id.

³² Id.

³³ F.O.R.C.E. report at p. 2.

³⁴ Id.

³⁵ Id.

³⁶ W.R.A.P. at p.30.

³⁷ Maine Solid Waste Management Rules, Chapter 400 §1 and Chapter 409 Appendix A

Permit Procedure

In between the ends of the regulatory spectrum, exemption from regulation on the one hand and requiring individual permits on the other, there are other gradations of regulatory procedure available to regulatory agencies with regard to compost operations. The spectrum of procedures ranges from notification, registration, permit-by-rule, and categorical or general permit. These additional procedural options provide for the protection of health and the environment while also lessening the compliance burden on composters. The scope and depth of information provided to regulators, the discretion over management of compost facility operations, and the stringency of compliance requirements vary depending on the procedures. Matching of classes of facilities to their proper level of regulation ensures that composting operations are at once encouraged and appropriately regulated.

Substantive Requirements

Facilities that are subject to regulation are typically required to submit a body of information to the controlling agency. The most universal requirements are for siting, design and operation of the compost facility. For lesser-regulated entities, these requirements are used to address potential nuisance and sanitization concerns. Additional information requirements for larger operations with a broader range of feedstocks include provisions for pathogen and vector³⁸ attraction reduction, and testing of finished product to ensure that it is stable³⁹ and does not contain hazardous materials like heavy metals. Finally, information pertaining to monitoring, reporting and recordkeeping is commonly required of most compost facilities.

c. Classification by Feedstock and Size

Feedstock Types

In the classification of feedstocks, two approaches are generally taken by other states. The “name” approach tends to categorize items that ultimately become part of compost by making specific distinctions based on the name of the material. Conversely, the characteristic approach is concerned with scientific attributes of the material and tends to combine materials based upon their Carbon : Nitrogen ratio. Both are useful and may be used in conjunction.

Naming distinctions are made between materials based on common understandings of the source and type of waste and are generally obvious to most people. For example, yard waste is generally considered to be grass clippings, leaves, and brush. Wood waste is generally the residual of processing timber. Garden waste is vegetables and plants that are unsuitable for human consumption. Food waste is from kitchens and processing facilities, and may or may not contain raw or cooked meat. Animal mortalities and offal from farms, fish waste, slaughtering and rendering waste from food processing facilities, manure from farm animals, are all easily understood terms. “Bio-solids” is another term for sewage sludge from wastewater treatment plants. Municipal solid waste may be comprised by a variety of things, including non-biodegradable and hazardous materials.

³⁸ “Vector” means organisms or media (air, water, soil, etc.) that serve to transmit disease organisms. Vermont Solid Waste Management Rules §6-201 Definitions.

³⁹ “Stabilized” refers to the condition of waste in which it no longer undergoes physical, chemical, or biological changes spontaneously. Vermont Solid Waste Management Rules §6-201 Definitions.

The advantages of the naming approach are that the classifications are familiar and general assumptions about the potential risk of the material may be made with some level of consistency. However, definitions may vary across contexts and the fringes of the classification may overlap. Furthermore, it is difficult to accurately generalize whether contaminating substances are present within a feedstock classification. For example, grass clippings and wood waste may or may not have chemical residues present within them. Also, from a risk precaution standpoint, the names may not be significant. For example, kitchen meat waste, animal mortalities, and industrial animal by-products may all pose the same level of putrescible risk, while they would presumably be subject to different levels of regulation.

In comparison, classifying feedstocks based upon their characteristics provides more certainty but is less familiar and therefore requires some translation.⁴⁰ The benefit of using the Carbon : Nitrogen ratio of a particular feedstock is that it allows for a more objective quantification of its risk. If composting ideally occurs at an initial C:N ratio of 30:1,⁴¹ with odors typically being present below 25:1, the materials that comprise the compost feedstock may be evaluated on their likely effect on the biological process. This method does not solve the problem of potentially contaminating agents being present. But, it may alleviate some of the challenges faced in making a particular material fit a naming definition. A classification approach that utilizes elements of both name and characteristics will have the greatest likelihood of achieving meaningful distinctions.

Size of Facilities

Facilities are generally classified by size in two different ways, as a rate of throughput or a normalized spatial measure. These two methods correspond to the amount of compost material produced or the physical dimensions of the operation. The cubic yard, as a measure of volume, is more common than tons, as a measure of weight. This is likely due to the variability in weight from moisture content. Cubic-yards-per-time-period is the most common method of expressing scale of production. Additionally, the size of an operation may be quantified by the volume of composting present relative to the dimensions of the site. Larger operations merit greater regulation simply because the scale of potential contamination or nuisance conditions is greater.

Composting Method Utilized

Some regulations classify facilities based upon the method utilized to effectuate the composting. Common distinctions are research and demonstration, landspread, and chip and grind facilities. “Research and demonstration” classifications are utilized to enable facilities experimenting with new methods and materials. Reduced compliance procedures may be appropriate during their testing to encourage development of more effective composting methods. “Landspreading” is the application of yard and wood waste to landscapes, and “chip and grind” is the mechanical reduction of woody materials into mulch. These two low-risk methods of composting are generally considered appropriate for reduced stringency of regulatory procedures also.

Other distinctions may be based upon the composting technology. EPA has described four categories of technology: “windrow, aerated static pile, in-vessel composting, and anaerobic

⁴⁰ See Maine Solid Waste Management Rules, Chapter 409 Appendix A

⁴¹ EPA, Decision Maker’s Guide to Solid Waste Management, Vol. II, Chapter 7 Composting, at p. 7-12.

processing.”⁴² One of the primary benefits of using these technologies is that they sanitize any pathogens that may be present. Notably, anaerobic technology generates methane and therefore can be used to generate electricity. As interest grows in alternative energy sources, some anaerobic facilities are subject to specialized regulation and incentives.⁴³

d. Permit Procedure based on Classification

Exemption

The most common exemptions from compost regulation are on-site operations such as backyard composting or at nurseries and other small businesses that generate organic matter and agricultural applications. At residences and organizations, composting of on-site generated feedstocks is generally exempt from regulation. Agricultural composting generally falls into two categories. Farms that compost only on-site generated materials are generally exempt from solid waste regulation. While these farms must still control their leachate in order to comply with water quality regulations, they generally do not need a permit to engage in composting. Farms that accept off-site generated materials for composting may be subject to regulation. If the amount of off-site generated materials is “limited to that necessary to optimize the composting of yard trash or manure generated on the farm,”⁴⁴ then the exemption still applies. If, however, the amount of off-site generated materials gives rise to the inference that farm is also a commercial composting operation, then the exemption typically does not apply.

Notification

This reduced requirement procedure serves to notify the regulator of composting activities assumed to “meet the general siting criteria of [general solid waste permit requirements] because of their small scale or the siting, design, or operational limitations placed on them.”⁴⁵ An example of some notification requirements utilized in Maine are:

- Applicant contact information and a fee;
- A brief narrative description of the composting operation and proof of the legal right to undertake the project;
- Topographic, flood plain, and tax maps;
- Soil and pad design underlying of the area on which the composting will occur;
- Fire control plans;
- Proof of public notice of the application and certification from the facility owner attesting to operation and closure in conformance with applicable regulations and laws.⁴⁶

Generally speaking from the point of view of the composter, the permitting process of notification is complete once the regulatory agency receives the application.

⁴² EPA, Decision Maker’s Guide to Solid Waste Management, Vol. II, Chapter 7 Composting, at p. 7-22.

⁴³ Spencer, Robert, “State Regulation of On-Farm Anaerobic Digestion,” *BioCycle Magazine*, October 2007.

⁴⁴ Kessler Consulting, Inc., F.O.R.C.E. Florida Composting Regulatory Report, August 2006

⁴⁵ Maine Solid Waste Management Rules, Chapter 400 General Provisions §3(B)

⁴⁶ Maine Solid Waste Management Rules, Chapter 409 Processing Facilities, §8(C)

Registration

The next level of regulatory procedure is registration. This method is only slightly more stringent than notification, but is still simpler than a permit-by-rule, categorical certification or general permit. The additional substantive requirements of a registration, compared to a notification, include operational, record keeping and reporting requirements. The additional procedural aspect of registration, compared to notification, is an affirmative acknowledgment from the regulatory agency of the registration. An example of registration requirements utilized in New York are:

- Composters may not begin composting until they have received a validated copy of their registration;
- Registrations are valid for the life of the facility;
- Reporting amount of waste received (by type of feedstock and time-frame of receipt), the origin of the waste received, and the destination of the waste removed, and a description of operational problems and solutions encountered during the reporting period; and
- Composters are subject to operational requirements imposed for categorical certifications.⁴⁷

Registration's incremental step towards more regulation is appropriate for composting operations which have more environmental risk than those deemed eligible for notification and less environmental risk than those requiring a permit-by-rule or categorical certification.

Permit-by-Rule

Between registration and categorical certification is permit-by-rule. This is a procedure which incorporates the use of a permit and therefore any conditions associated with granting of the permit, rather than just official notice that the regulator is aware of their operation. But, registration is procedurally less onerous than a categorical certification because the issuance of the permit is automatic provided the applicant and the composting operation meet all requirements. The combination of stringent substantive requirements and automatic qualification for the permit provides an additional level of regulation which embodies a compromise between streamlined procedure and appropriate environmental oversight. This gradation in certification procedure is appropriate for moderate risk facilities.

Categorical Certification (aka General Permit)

The next level of stringency is the permit application. Whether the application is for a categorical composting permit or a solid waste permit, there are many common elements. Application requirements include provisions pertaining to siting, design, operation, pathogen reduction, vector attraction reduction, heavy metals, monitoring, record keeping, reporting, and finished product testing and labeling. Vermont's existing regulatory structure incorporates these elements.

⁴⁷ New York State Department of Environmental Conservation 6 NYCRR §360-1.8(h)

e. Requirements based on Procedure

The combination of facility classification and required procedure form the structure of regulatory policy. After identifying the types of facilities that will be regulated, procedures for compliance may be assigned. The most efficient regulatory design will enable adjustments to be made to the assignments of procedure to facility type. These decisions are best made through a stakeholder process which identifies all issues and collaborates to develop regulations.

VII. Putting It All Together

An excellent illustration of a regulatory matrix found in the F.O.R.C.E. report is recreated below. This chart shows a summary of regulatory classifications based upon an analysis of seven states “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.”⁴⁸ It is significant because it shows the thresholds for distinctions between regulatory procedures, highlighted by arrows in the chart.

For example, it states that most of the states analyzed elevate a source-separated organic material compost facility from registration to categorical permit if it accepts food material (rather than just vegetative food material), is greater in size than 5,000 cubic yards per acre, or has an initial carbon to nitrogen ratio less than 20:1. To further illustrate, this same facility would then be required to obtain a full solid waste permit if it received biosolids.

This illustration is especially useful as it enables one to evaluate Vermont’s regulations in comparison to other states known for progressive regulation. While the specifics contained in the chart may not necessarily be in accord with Vermont’s regulatory goals, the graphical representation of the regulatory structure provides a working model, which may be adjusted accordingly. More detailed, state-specific analyses are found in the appendices of the F.O.R.C.E. report.

⁴⁸ F.O.R.C.E. report at p.1

Summary of Regulatory Classification of Organics Recycling Facilities⁴⁹

Facility Type	Regulatory Category			
	Exempt	Registration	General Permit	Full Permit
Backyard Compost	Source-separated organic materials generated on-site at any time			
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		
Landsread	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

⁴⁹ This chart has been reproduced verbatim from the F.O.R.C.E. report, p. 34.

VIII. Conclusion

An expanded number of categorizations and enhanced thresholds corresponding to environmental risk would provide a mechanism for implementing a tiered system of procedural and substantive permitting requirements. More gradations in the level of regulatory oversight would enable progress towards realizing the purposes of the regulations and may be utilized in more efficient regulation of composting operations.