US Composting Council©

# Model Compost Rule Template

# US Composting Council


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SUMMARY

In 2011, the USCC initiated a public-private partnership to develop a Model Compost Rule Template (MCRT). The template includes a three-tiered permit structure, with design and operating requirements based on materials composted and technology employed. The foundation of the tiers is the feedstock categories, which are based on the materials' potential risks to human health and the environment. The template also includes siting and testing requirements based on quantity and types of feedstocks processed, as well as reporting, training and certification, and operating requirements. The MCRT is anticipated to be a "living document" that will be periodically reviewed and updated as knowledge and experience in compost manufacturing and regulating continue to mature. In 2021 the USCC assembled a task force group to review the existing template, identify areas that required updating, and address new sections to include in Version 2.0.

PROJECT DESCRIPTION

The US Composting Council, in conjunction with the Georgia Environmental Protection Division, BioCycle, and a volunteer Task Force composed of state composting regulators, composting facility operators, and several consultants, developed a MCRT to assist state regulatory agencies in development and/or revision of their composting regulations. Model composting rules, based on science as well as experience, are needed as a foundation for operators and regulators to help facilitate the permitting process and aid in regulatory oversight. To ensure consumer confidence in compost quality and build composting infrastructure, composting facilities must be designed, operated, and regulated to ensure quality products are produced and high standards are maintained that are protective of public health and the environment.

BACKGROUND/HISTORY

- In 2010, the Georgia Department of Natural Resources' Environmental Protection Division (GAEPD) approached the US Composting Council (USCC) about collaborating on a partnership to develop a MCRT.
- In 2011, the USCC and GAEPD launched an initiative to interview state regulatory personnel and compost operators from around the country about design and operational practices at composting facilities. The intent was to accomplish two important goals:
    1. Ensuring Georgia's proposed composting rule changes are science-based, while offering verification that similar rules adopted in other states have been effective, both in theory and in practice.
    2. Providing USCC the foundation and background data needed to develop a template of model rules, incorporating the recommendations, experience, and ideas of composting professionals around the country

- Engaged the Fanning Institute at the University of Georgia to conduct a series of confidential interviews and an online survey with composting regulators and private composting facility operators in various states.
    - The Georgia "strawman" rule (developed as part of a stakeholder process in 2009) was used as the basis for interview questions. Fanning conducted confidential interviews with 15 private operators around the U.S., 4 state regulators from throughout the country, and facilitated an online survey of state regulators from every state with a composting program. Private operators interviewed represent small, medium, and large-scale facilities using a variety of composting methods and systems to process a variety of organic residual streams.
- Surveys and interviews were conducted from the fall of 2010 through spring of 2011. Specific responses were kept confidential and aggregated with responses from interviews with state counterparts from various states. Aggregated responses and recommendations for changes to the Georgia strawman composting rule were provided by the Fanning Institute to GAEPD and the USCC in August 2011.
- The USCC used the findings of the interviews and surveys, along with the most current draft of Georgia's revised composting rule (still undergoing administrative review in Georgia in November 2012), to provide the foundation and background data for development of a MCRT.
- The USCC contracted with Nora Goldstein, Editor of BioCycle, to serve as facilitator and editor of its MCRT project. The arrangement began in December 2011.
- The USCC created a core project team to manage and oversee development of the MCRT. Members of the core project team originally included Frank Franciosi, USCC President, Wayne King, USCC Past President, Stephanie Busch, Environmental Project Administrator with the GAEPD, Cary Oshins, USCC Director of Education and Training, Michael Virga, USCC Executive Director and Nora Goldstein. About halfway through this project, Brenda Platt, chair of the USCC Legislative and Regulatory Affairs Committee, joined the core project team.
- The USCC convened a Task Force to advise and provide input into the development of the MCRT. The Task Force was composed of state composting regulators, composting facility operators, composting consultants, and technical experts. The kick-off Task Force conference call was held in late February 2012. Task Force calls were held monthly through July 2012. The Task Force was asked to do a final review of the MCRT in October. Final comments are reflected in the MCRT.
- In the fall 2019, the USCC formed a small task force of compost manufacturers, regulators, and industry consultants to review the current MCRT, identify sections that required updating, and determine whether to add any new content. The sections on Definitions and Exemptions were identified as needing updating. It was also decided that new additional sections on Training & Certification, Annual Reporting and Product Testing would be added.
- In 2020, USCC staff developed surveys for each of the sections described above. A series of surveys went out to all 50 state regulators that were involved with compost facility permitting. Twenty-nine (29) States and 1 US Territory participated in one or more surveys.
- The following is a list of states and one territory that participated:
- AK, AL, CA, CO, DE, HI, IA, ID, KY, KS, MD, MO, MS, MT, NH, NM, NY, OH, OK, OR, PA, SC, TN, UT, VA, VT, WA, WI, WY & US Virgin Islands.

- In 2021, USCC staff compiled the survey data and developed a matrix to identify and group common threads throughout the survey responses. The USCC formed an extended group of stakeholders that met virtually to review the survey responses and reach consensus on changes to incorporate in Version 2.0 of the template.

## KEY ELEMENTS OF THE USCC MODEL COMPOST RULE TEMPLATE

The MCRT project team, with significant input from the Task Force, used the following key elements to guide development of the MCRT:

- The USCC MCRT would follow a tiered approach, with regulatory compliance requirements increasing with each subsequent tier. This approach was, in part, modeled off the latest drafts of the State of Georgia's revised compost rules and was supported in the majority of comments gathered through the Fanning Institute interviews.
- All measurement units provided for feedstock/product size in the MCRT are in tons. Tons are the preferred unit as they more accurately represent the nature of the feedstock or product moving in and out of a facility. However, USCC recognizes that not all facilities are equipped with scales that can provide this information. Therefore, there is a Unit Conversion Chart included in the appendix of this rule that can be used to estimate tonnage based on cubic feet.
- All tiers described in the MCRT are required to meet the time and temperature requirements in the Process to Further Reduce Pathogens (PFRP)[1].
- The MCRT would be performance-based, descriptive and not prescriptive, i.e., it covers all the key aspects of designing and operating a composting facility that will protect human health and the environment but does not specify how the composting facility will achieve that level of protection. For example, the MCRT requires control of nuisance odors, but doesn't prescribe how that will be done or to what level odors must be mitigated.
    - The exception to this preference for performance versus prescriptive-based rules comes in groundwater protection sections of Tiers Two (*Section 4.II.B.2*) and Three (*Section 5.II.B.2*). Here we have opted to provide two alternatives in each, Alternative A being performance based and Alternative B more prescriptive. States adapting these rules will have to decide which alternative to choose.
- To create a MCRT that was as comprehensive and inclusive as possible, a variety of state composting rules helped to guide development of the final template. For example, the initial list of definitions (*Section 1. Definitions* of this rule) were compiled from states such as Oregon, Ohio, Georgia, California, Washington, Kansas, and several others. This list was ultimately edited and whittled down by the Task Force and core project team. This approach was utilized for all sections of the final MCRT.
- Because the regulatory environment around the composting of animal mortalities varies largely from state to state, animal mortalities are not included in any of the feedstock categories listed in this rule. Composting of animal mortalities on farms is included as an exemption in *Section 3. Exemptions* of this rule, but the inclusion of animal mortalities in a regulated feedstock category will be left up to state-specific composting rules.

[1] 40 CFR Appendix B to Part 503 B. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-O/part-503/appendix-Appendix%20B%20to%20Part%20503#p-Appendix-B-to-Part-503(B.)

- The USCC MCRT does not address static piles or windrows that are not actively managed or aerated at this time. This method of composting may be addressed in a future version.
- Finally, a very key element that guided the development of the MCRT is the importance of terminology. The terms included in this rule template were chosen intentionally and as a result of extensive stakeholder discussion regarding the implications around language used. See appendix for justification of language choices, where applicable.

MODEL COMPOST RULE TEMPLATE GUIDE

- The terms that are listed in *Section 1. Definitions* and are capitalized and in double quotes refer to terms that are defined in this rule.
- The terms that are listed in *Section 1. Definitions* are lower case with single quotes refer to terms that are not defined in this rule.
- Terms referred to in sections other than *Section 1. Definitions* are exclusively terms that have been defined and are not capitalized or denoted with quotations outside of *Section 1. Definitions*.
- Where "[X (unit)]" stands in the place of a value is intentionally left to allow states to set a specific threshold according to their own discretion or in congruence with their own circumstances.
- The appendix section at the end of this rule is designed to provide additional information/rationale for elements of this rule where referenced.

Please submit comments and questions regarding the MCRT by using the response form at: https://www.compostingcouncil.org/page/ModelRuleTemplate

## Section 1. Definitions

**Agricultural Composting:** Composting conducted by an agricultural operation on lands used for animal and or crop production operations.

**Agricultural Residuals:** Materials generated by the customary and generally accepted activities, practices, and procedures that farmers engage in during the production and preparation for market of poultry, livestock, and associated farm products; from the production and harvesting of agricultural crops which include agronomic, horticultural, and silvicultural crops; and materials resulting from aquaculture production. Includes manures not managed as part of a Confined Animal Feeding Operation (CAFO) permit.

**Aerated Static Pile Composting**: The process in which decomposing organic material is placed in piles over an air supply system that can be used to supply oxygen and control temperature for the purpose of producing compost. Piles must be insulated to assure that all parts of the decomposing material reach and maintain temperatures at or above 55°C for a minimum of 3 days.

**Best Management Practices (BMP's):** Commonly accepted methods or techniques found to be the most effective and practical means in achieving an objective (such as preventing or minimizing pollution and or a public nuisance) while making the optimum use of the facility's resources. Source: Business Dictionary

**Biosolids:** Solids derived from primary, secondary or advanced treatment of sanitary wastewater that have been treated through one or more controlled processes that significantly reduce pathogens and reduce volatile solids or chemically stabilize solids to the extent that they do not attract vectors.

**Capacity:** The amount of material, in tons or cubic yards, a facility can hold at any one time. Includes feedstocks, actively composting and curing material, and final product storage.

**Certificate of Completion:** Document issued by a certifying organization stating that the compost facility operations manager has met the requirements for the specified compost operator training program.

**Certified Compostable Products**: Any product specifically manufactured to break down in a compost system at the end of its useful life. Examples include containers, films, or foodservice ware such as bowls, plates, cups, cutlery, and bio-plastic liner bags. Products are composed of materials such as vegetable matter, paper, cardboard, and plastics and are certified as conforming to ASTM D6400[2] or ASTM D6868[3] standards. A third-party certification body should be required, as approved by the state. These products should be labeled in accordance with the state labeling guidelines.

**Certifying Organization:** Public or private entity approved by the [state regulatory agency] to provide compost operations training.

**Community Composting**: Any activity that composts green material, agricultural material,

[2] https://www.astm.org/d6400-21.html

[3] https://www.astm.org/d6868-21.html

food material, and vegetative food material, alone or in combination, and the total amount of feedstock and compost on-site at any one time does not exceed [xxx] cubic yards and [xxx]square feet. Source: CalRecycle (See Appendix 1.B.3.a.)

**Compost:** The product manufactured through the controlled aerobic, biological decomposition of biodegradable materials. The product has undergone mesophilic and thermophilic temperatures, which significantly reduces the viability of pathogens and weed seeds and stabilizes the carbon such that it is beneficial to plant growth. Compost is typically used as a soil amendment but may also contribute plant nutrients. Source: USCC/ Association of American Plant Food Control Officials (AAPFCO)

**Composting:** The controlled process and management of aerobic, biological decomposition of biodegradable materials by using a specific method. This process has undergone mesophilic and thermophilic temperatures, which significantly reduces the viability of pathogens and weed seeds and stabilizes the carbon such that it is beneficial to plant growth. Source: USCC

**Composting Facility (or Operation):** Buildings, grounds (see "Composting Pad") and equipment dedicated to the manufacture of compost. Also includes stormwater control devices.

**Composting Facility Design Plan:** A design plan containing the intended design of the facility including process flows, equipment requirements, site details, and surface water control features, and the intended feedstocks and associated amounts to be accepted. (See Appendix 3.B.2.)

**Compost Facility Operation Plan:** An operations plan containing the facility's points of contact, schedule of operations, compost methods employed, plan for finished compost, nuisance mitigation plan and contingency plan. See *Section 11. Compost Facility Operations Plan* for more information.

**Composting Pad:** Any area at a "Composting Facility or Operation" used for the storage and/or processing of feedstocks, additives, amendments, or compost (active, curing, or final product). May be subdivided by function, such as 'mixing pad', 'composting pad', 'curing pad ' or 'storage pad'. An 'all weather composting pad' is one of sufficient construction, firmness and grading so that composting equipment can manage the process during normal inclement weather, including expected rain, snow, and freezing temperatures.

**Contact Water:** A liquid that has run off, or emerged from, raw feedstock and materials that are being processed, or a liquid that has come into contact with equipment dedicated to the handling of raw feedstocks or unstabilized compost, and which contains extracted, dissolved, or suspended materials. Contact water also includes condensate from gasses resulting from the composting process. It does not include water from curing materials, finished compost or product storage piles. See also "Stormwater", "Run-off", and "Run-on" (See Appendix 1.B.1.a.)

**Crop Residues:** Materials generated by the production, harvesting and processing of agricultural or horticultural plants. These residues include but are not limited to stalks, stems, leaves, seed pods, husks, bagasse, and roots.

**Curing:** A continuation of the composting process after the high heat stage during which maturity continues to increase. For the purposes of these regulations, compost enters the curing stage after completing the process to further reduce pathogens and the requirements for vector attraction reduction and after achieving biological stability. See also "Maturity" and "Stability"

**Digestate:** When an anaerobic digester processes organic material, it produces a gas (biogas) plus liquid and solid digested material. Those liquids and solids are called digestates. Raw or whole digestate produced by a biogas system is physically and chemically different from the organic input material used to produce it. Source: American Biogas Council

**Feedstock:** Organic materials used in the production of compost, classified into different types for purposes of regulation.

**Food Processing Residuals:** Organic materials generated as a by-product of the industrial food processing sector that are non-toxic, non-hazardous, and contain no sanitary wastewater.

**Food Residuals:** Pre- and post-consumer food discards from households and the commercial/institutional sector including but not limited to vegetables, fruits, grains, dairy products, meats, and compostable foodservice ware/packaging that may be commingled. Synonyms include 'food scraps' and 'pre/post-consumer food residuals' (See Appendix 1.B.2.a.)

**Hazardous Waste:** Any substance identified by regulation as hazardous waste under RCRA[4].

**Industrial By-Product**: Organic, compostable materials generated by manufacturing or industrial processes that are non-toxic, non-hazardous, and contain no domestic wastewater.

**In-vessel Composting:** The process in which decomposing organic material is enclosed in a drum, silo, bin, tunnel, or other container for the purpose of producing compost; and in which temperature, moisture and air-borne emissions are controlled, vectors are excluded, and nuisance is reduced.

**Maturity:** Measure of the degree or level of completeness of composting. Maturity is not described by a single property and therefore, maturity is best assessed by measuring two or more compost characteristics. Some immature composts may contain high amounts of free ammonia, certain organic acids or other water-soluble compounds which can limit seed germination and root development, or cause odor. The bioassay used in the Seal of Testing Assurance (STA) Program uses a seed germination and growth test to measure the percent of seed emergence and relative seedling vigor. Test method is described in the Test Methods for the Examination of Composting and Compost (TMECC)[5]. Source: USCC

**Mulch:** Any organic material derived from grinding, shredding, or chipping woody materials (or Type 1 feedstock) and used on the soil surface to reduce weeds, conserve soil moisture, improve water infiltration, or for aesthetic purposes.

**Nonrecoverable Material**: Material that cannot be recycled or composted.

**Odor Impact Minimization Plan**: Operational plan designed to minimize odors at the property boundary and to coordinate the mitigation measures that should be taken if odors do occur. The Odor Impact Minimization Plan is included as part of the Compost Facility Operation Plan. See *Section 11. Compost Facility Operations Plan* for more information.

**Operations Manager:** Person responsible for the overall operation and site management of a composting facility.

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[4] Resource Conservation and Recovery Act of 1976, 42 U.S.C.A. § 6921. https://www.govinfo.gov/content/pkg/USCODE-2009-title42/pdf/USCODE-2009-title42-chap82-subchapIII-sec6921.pdf

[5] https://www.compostingcouncil.org/page/tmecc

**Process to Further Reduce Pathogens (PFRP)**: a treatment process that is able to consistently reduce sewage sludge pathogens (i.e., enteric viruses, viable helminth ova, fecal coliforms, and Salmonella spp.) to below detectable levels at the time the treated sludge is used or disposed. Source: EPA

**Run-off:** Precipitation that drains over land and flows off the facility in either laminar or concentrated flow.

**Run-on:** Precipitation that drains over land onto any part of the facility.

**Seal of Testing Program (STA):** Is an information disclosure program developed and managed by the USCC. The science behind the development of the STA Certified Compost Program and the various tests that are used is contained in TMECC. These were selected to help both compost producers and purchasers to determine if the compost they are considering is suitable for the use that they are planning, and to help them compare various compost products using a testing program that can be performed by a group of independent, certified labs across the USA and Canada**.** Source: USCC

**Silviculture**: The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society. Silviculture treatments include thinning, harvesting, planting, pruning, prescribed burning, and site preparation. Source: U.S. Forest Service

**Sludge:** Any untreated solid, semi-solid, or liquid residuals generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant.

**Source-Separated Organics:** Organic material that has been separated from non-compostable material at the point of generation, including but not limited to "Vegetative Materials", "Yard Trimmings", "Woody Materials", "Food Residuals", and "Certified Compostable Products". (See Appendix 1.B.1.b.)

**Stability:** A specific stage or state of organic matter decomposition during composting, which is related to the type of organic compounds remaining and the resultant biological activity in the material. Source: USCC (See Appendix 1.B.1.c.)

**Stormwater:** A liquid that has run off or emerged from curing materials, finished compost or product storage piles. Does not include liquid that has come into contact with raw feedstocks or active composting piles. (See Appendix 1.B.1.a.)

**Test Methods for the Examination of Composting and Compost (TMECC):** A laboratory manual modeled after the American Society for Testing and Materials (ASTM).
TMECC provides protocols to sample, monitor, and analyze materials at all stages of the composting process, i.e., prior to, during, and after composting to help maintain process control, verify product attributes, assure worker safety, and to avoid degradation of the environment in and around the composting facility. Source: USCC – Compost Research & Education Foundation (CREF)

**Throughput:** Amount of material, in tons or cubic yards, a facility can process in a given amount of time. This rate is limited by the capabilities of equipment, personnel, and infrastructure. Synonyms include 'process rate' (See Appendix 1.B.2.b.)

**Urban Agriculture:** The practice of growing or producing food in a city or heavily populated

town or municipality. Urban agriculture assumes a level of commerce, as practices that fall under this definition grow/produce products to be sold as opposed to products grown/produced for personal consumption or sharing. Source: Greensgrow

**Yard Trimmings:** Leaves, grass clippings, brush, garden materials, tree trunks, tree stumps, holiday trees, and pruning's from trees or shrubs that has not been treated chemically or with adhesives and coatings such as paint, glue, or any other visible contaminant. Can also include vegetative materials resulting from the use of commercial products, including but not limited to discarded flowers, potted flowers, or grave blankets that do not include plastic, metal, polystyrene foam, or other non-organic material. Synonyms include 'green waste' and 'yard waste' (See Appendix 1.B.2.c.)

**Vector:** A living animal, including but not limited to insects, rodents, and birds, which is capable of transmitting an infectious disease from one organism to another.

**Vegetative Materials:** Materials derived from plants including but not limited to fruit and vegetable peelings or parts, grains, coffee grounds, crop residues, non-recyclable paper, waxed cardboard, and uncoated paper products. Types of vegetative materials include "Crop Residues", "Yard Trimmings" and "Woody Material". Vegetative material does not include oil, grease, or dairy products.

**Vermicomposting:** The controlled and managed process by which live worms convert organic materials into dark, fertile, granular excrement or castings.

**Vermiculture:** The breeding of earthworms in organic media for the purpose of producing vermicompost.

**Windrow Composting:** The process in which decomposing organic materials are placed in long piles for the purpose of producing compost. The piles are periodically turned or agitated to assure all parts of the decomposing material reach the desired stability.

**Woody Material:** Residual materials, including but not limited to sawdust, pallets, and dimensional lumber that has not been treated chemically or with adhesives and coatings such as paint, glue, or any other visible contaminant.

## Section 2. Feedstock Categories

**Type 1** feedstocks include yard trimmings, woody materials, crop residues, and other vegetative materials determined to pose a low level of risk to human health and the environment, including from physical contaminants and human pathogens.

**Type 2** feedstocks include agricultural residuals, source-separated organics, [state regulatory agency] approved food processing residuals, and industrial by-products. Type 2 feedstocks are materials that the department determines pose a low level of risk to the environment but have a higher level of risk from physical contaminants and human pathogens compared to Type 1 feedstocks.

**Type 3** feedstocks include sludge, biosolids, diapers, and food processing residuals and industrial by-products not covered in Type 2. Type 3 feedstocks consist of these and other materials the department determines pose a higher level of risk to human health and the environment from physical and chemical contaminants and human pathogens, compared to Type 1 and 2 feedstocks.

**Prohibited** feedstocks include asbestos-containing wastes, biomedical wastes, petroleum-containing wastes, toxic or radiological wastes, hazardous wastes, and any other prohibited wastes defined in [state rule].

## Section 3. Exemptions

I. Composting facilities that meet one or more of the following criteria are exempt from these rules. Each exemption is independent of the others.

II. The following exemptions do not exempt facilities from complying with other applicable regulatory requirements (ex. Facilities composting manure are still subject to water management requirements).

III. Facilities that are exempt from these rules (apart from *Subpart III.b.* of this section) are still required to contact their [state regulatory agency] to justify exemption. (See Appendix 2.A.)

a. Size/Feedstock Exemption: Facility must meet all the following size requirements for specified feedstock to qualify for exemption.
    i. Any composting facility with a throughput of less than 100 tons of Type 1 feedstock during any calendar year.
    ii. Any composting facility with a throughput of less than 20 tons of Type 2 feedstock during any calendar year.
    iii. Any composting facility with a throughput of less than 40 tons of Type 2 feedstock in any calendar year using an in-vessel composting method.

b. Backyard Composting Exemption: Composting of source-separated organics in one's own residential backyard.

c. Agricultural Exemption: Animal and crop production operations that compost agricultural residuals, yard trimmings, woody materials, crop residues, food residuals and/or food processing residuals provided that the following conditions are met:
    i. The feedstock composted is generated on-site (unless that feedstock qualifies for *Subpart III.d.* of this section).
    ii. The composting facility is located on property owned or leased by the animal or crop production operation.
    iii. The composting facility is operated in such a manner that noise, dust, and odors do not constitute a nuisance or health hazard and does not cause or contribute to surface or groundwater pollution.
    iv. All compost produced is utilized exclusively at the animal or crop production operation where it was produced.

d. Yard Trimmings Exemption: Operations that only accept yard trimmings as a feedstock provided the following conditions are also met:
    i. No more than [X tons/year] of feedstock is accepted.
    ii. No more than [X tons] of raw feedstock is on the facility grounds at any one time.
    iii. No more than [X tons] of active compost is on the facility grounds at any one time.
    iv. No more than [X tons] of finished compost is on the facility grounds at any one time.
    v. Compost produced is not distributed to the public.

e. Small Scale Exemption: Operations where the total amount of feedstock and compost on-site at any one time does not exceed [X cubic yards] and [X square feet]. Examples include community composting, composting on-site at a university or other academic institution, or composting at a place of business. Small Scale Exemption stands provided the following conditions are also met:
    i. Only Type 1 and Type 2 feedstocks are accepted

ii. No more than [X tons/year] of feedstock is accepted if using _____ method
iii. No more than [X tons/year] of feedstock is accepted if using _____ method (See Appendix 2.B.1.)
iv. No more than [X tons] of raw feedstock is on the facility grounds at any one time.
v. No more than [X tons] of active compost is on the facility grounds at any one time.
vi. No more than [X tons] of finished compost is on the facility grounds at any one time.
vii. Final compost produced is tested according to *Section 8. Composting Testing* of this rule.

f. Operations composting mortalities provided such composting is in accordance with the requirements of [state]'s Dead Animal Disposal requirements or conducted under auspices of the [state] Department of Transportation, [state] Department of Agriculture, or other agency programs.
g. Operations composting animal manures or sewage sludges where such activities are permitted under Concentrated Animal Feeding Operations (CAFO) or National Pollutant Discharge Elimination System (NPDES) permits.

## Section 4. Tier One

I. Referenced Feedstock Category: Type 1 feedstocks include materials such as yard trimmings, woody materials, crop residues, and other vegetative materials determined to pose a low level of risk to human health and the environment, including from physical contaminants and human pathogens.

II. Design and Operating Standards

A. Tier One composting facilities may process Type 1 feedstocks only.

B. Tier One facilities shall meet the following design standards in order to operate in a manner that is protective of human health and the environment:

1. The feedstock receiving, processing and storage areas must be clearly defined, and the maximum throughput and capacity specified.
2. The land surface of the materials placement area shall have a slope greater than or equal to one percent and less than or equal to six percent so as to direct surface water to collection points or otherwise control the surface water drainage.
3. Prevent run-on from reaching the composting pad.
4. Site shall not cause a discharge of contact water to surface water.
5. Prevent ponding and erosion.
6. Minimize the potential impact to surface water and groundwater.
7. Collect and contain contact water within the boundary of the composting facility and prevent it from discharging to waters of the state, unless otherwise authorized by an NPDES discharge permit.
8. Facilities operating on a seasonal basis only (e.g., fall leaves and spring yard clean-outs) must comply with *Subpart II.B.1.- II.B.4.* of this section. All other Tier One composting facilities shall include an all-weather composting pad.
9. Construction of roads within the facility boundary to allow for passage of vehicles at all times.
10. Signs are posted with letters not less than three inches in height at the entrance of the composting facility
11. that include the following statement:
12. "This composting facility only accepts [authorized feedstock types] and will not accept hazardous wastes, asbestos, batteries, or other prohibited materials."

C. Tier One facilities shall meet the following operational standards:

1. No material may be stored in excess of the designated capacity.
2. Facility operations managers must be able to document training in the basics of compost facility operations within the first year of supervising the facility. Training must consist of classroom and hands-on course work and conclude with a certificate of completion that must be kept on site at all times. Appropriate compost operations training must be approved by the [state regulatory agency]. See *Section 10. Training*

*and Certification* of this rule for more information on training and certification requirements.

3. Facilities must develop and follow a Composting Facility Operations Plan (CFOP) — reviewed and approved as part of the Tier One permit application — that describes operational procedures (methods and practices) to comply with the intent of regulations to protect public health and the environment and not create nuisances. This includes measures to control nuisance odors, vectors, fires, contact water and stormwater. The CFOP must be internally reviewed annually and updated when there is a change to procedures (including equipment) and/or feedstocks being processed and reflect how the facility will continue to comply with the intent of the rules. The CFOP must be available to the permitting authority upon request. See *Section 11. Compost Facility Operations Plan* of this rule for more information on CFOP's.
4. Facilities shall be maintained in a clean and sanitary condition, i.e., free of unsecured trash, at the end of each operating day.
5. Operators of composting facilities shall comply with all local rules, regulations, and ordinances pertaining to their facilities.
6. Feedstocks must be managed in a timeframe that minimizes odors, contact water, fire and scavenging by vectors.
7. Contact water generated shall be directed to a containment, recycling, and/or treatment system sized to handle at a minimum of a 24-hr 25-yr storm event.
8. Stormwater shall be managed through Best Management Practices in alignment with state/location-specific regulations and NPDES guidelines. (See Appendix 3.B.1)
9. Storage of finished compost on site is limited to 12 months of production, unless approved by the [state regulatory agency] on a case-specific basis.
10. Non-compostable waste shall be removed or stored in a waste container and/or containment area and disposed of or recycled at a permitted solid waste facility in a timeframe approved in the CFOP (or as required by local regulating authority and/or as soon as the container is full).
11. Compost processing time and temperatures shall be sufficient to kill weed seeds, meet PFRP requirements, reduce vector attraction and produce compost that meets the stability necessary for the intended use (see *Section 8. Compost Testing*). Pathogen and vector attraction reduction compliance is achieved as follows:
    a. Windrow composting: the compost material must be maintained at a minimum average temperature of 55°C or higher for 15 days or longer. During the period when the compost is maintained at 55°C or higher, there shall be a minimum of five turnings of the windrow with a minimum of 3 days between turnings. The 15 or more days at or above 55°C do not have to be continuous.
    b. Aerated static pile or in-vessel composting process: Material maintained at a minimum average temperature of 55°C or higher for three consecutive days, followed by at least 14 days with a minimum of 45°C.

12. The composting processing areas shall be maintained and repaired, as needed, to be kept in good working order.
13. Records shall be maintained that identify the weight or volume of incoming feedstocks and outgoing finished compost. Records documenting compliance of the composting facility with the Rules shall be kept for a minimum of three years from the date of the record and be in a form suitable for submission or inspection by the [state regulatory agency]. (See *Section 9. Annual Reporting*)
14. Notice of final closure must be provided to the Director within 270 days (or as specified by state requirements) of receiving the final load of material. Any site not operated on a seasonal basis only and not receiving material for 270 days shall be deemed abandoned and in violation of these Rules unless properly closed. Notice of closure must include the date of final material receipt and a site closure plan for managing all feedstock and active, curing, and finished compost and compost-blended products remaining on site. In addition, the site closure plan must address how contact water stored in containment structures or ponds will be treated and/or removed. All material shall be removed from the facility within 270 days unless it is being utilized as part of site closure as described in the site closure plan.
15. The facility shall have a sign at the entrance of the facility that lists the following: name of facility; operating permit number; hours of operation; and emergency contact information.

## Section 5. Tier Two

I. Referenced Feedstock Category:

Type 2 feedstocks include all Type 1 feedstocks plus: agricultural residuals, source-separated organics; and [state regulatory agency] approved food processing residuals and industrial by-products. Type 2 feedstocks are materials that the department determines pose a low level of risk to the environment but have a higher level of risk from physical contaminants and human pathogens compared to Type 1 feedstocks.

II. Design and Operating Standards

A. Tier Two composting facilities shall process Types 1 and/or 2 feedstocks only.

B. Tier Two composting facilities shall meet the following design standards in order to operate in a manner that is protective of human health and the environment:

1. Owner or operator must submit a Design Plan for approval with the facility application. (See Appendix 3.B.2.)

2. Tipping, mixing, active composting, curing, screening, and finished compost storage areas must be on an all-weather pad.

ALTERNATIVE A:

The all-weather pad shall be designed, constructed, and maintained to:

a) prevent ponding and impede vertical movement of potential contaminants from contact water;
b) reliably transmit any free liquid present during the storage, treatment, and processing of materials laterally to a containment structure to prevent liquids from entering surface water or groundwater; and
c) prevent conditions that could contribute to, or cause contamination.

ALTERNATIVE B:

The all-weather pad must meet the following criteria:

a) Five feet or more from the top of the zone of continuous groundwater saturation

b) Soils within the five feet are composed of any combination of the following soils: sandy clay loam, loam, silt loam, silt, sandy clay, clay loam, silty clay loam, clay, and silty clay

c) If either less than five feet from the top of the zone of continuous groundwater saturation or soils other than those listed in *Subpart II.B.2 Alternative B.b.* of this section, an improved low permeability surface is required for tipping, mixing and active composting areas. An all-weather pad is allowed for curing and finished product storage.

The improved low permeability surface can be constructed of:

i. Low permeability soils that meet FHWA Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects for Subgrade Stabilization[6]

ii. Other: Concrete, asphalt, lime-fly ash compacted soils, FHWA Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects for Minor Crushed Aggregate [7] or other approved methods.

d) All-weather pad shall be of sufficient slope (1 to 6 percent as determined by site conditions) to direct contact water to the appropriate collection, storage, and treatment system.

3. A stormwater management plan must be submitted with the permit application. Stormwater control features shall be designed, constructed, and maintained to prevent run-on onto the facility during peak discharge from a 25-year, 24-hour storm event and to control and collect the run-off stormwater volume resulting from a 25-year, 24-hour storm event.

4. Contact water must be segregated and directed to a containment, recycling, and/or treatment system.

5. The maximum composting process windrow or pile size and minimum composting process windrow or pile spacing shall match the capability and requirements of the equipment used at the facility. As pile heights increase, windrows or piles should be monitored to minimize compaction, a potential cause of odor.

6. The composting facility shall have all-weather access roads. The facility shall be designed such that access to the composting facility shall be limited to authorized entrances, which shall be secured from public access when the facility is not in operation. Access roads should be designed so that trucks delivering feedstocks or removing products are not queued up on public roadways. Facilities may also consider local fire requirements in access road design.

7. A plan and procedure for monitoring the temperature and moisture during composting shall be provided and should demonstrate that PFRP time-temperature relationships are met. The temperature and moisture ranges for the composting cycle shall be specified. The plan shall include contingencies for not meeting the specified ranges for the composting process.

C. Tier Two facilities shall meet the following operational standards:

1. Facility operations managers must be able to document training in the basics of compost facility operations within the first year of supervising the facility. Training must consist of classroom and hands-on course work and conclude with a certificate

[6] Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-14), Section 213. USDOT, FHA. https://highways.dot.gov/sites/fhwa.dot.gov/files/docs/federal-lands/specs/12851/fp14.pdf#page=159

[7] Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-14), Section 302. USDOT, FHA. https://highways.dot.gov/sites/fhwa.dot.gov/files/docs/federal-lands/specs/12851/fp14.pdf#page=228

of completion that must be kept on site at all times. Appropriate compost operations training must be approved by the [state regulatory agency].

2. Facilities must follow a Composting Facility Operations Plan (CFOP) — reviewed and approved as part of the Tier Two permit application — that describes operational procedures (methods and practices) to comply with the intent of regulations to protect human health and the environment and not create nuisances. This includes measures to control nuisance odors, vectors, fires, contact water and stormwater, as well as provisions for prompt equipment repair or replacement when needed. The CFOP must be internally reviewed annually to ensure it continues to reflect current procedures, equipment, and feedstock(s). The CFOP must be updated when there is a change to procedures (including equipment), or the types of feedstocks processed and reflect how the facility will continue to comply with the intent of the rules. The CFOP must be available to the permitting authority upon request.
3. Facilities shall be maintained in a clean and sanitary condition, i.e., free of uncontained wastes at the end of each operating day
4. Operators of composting facilities shall comply with all local rules, regulations, and ordinances pertaining to their facilities.
5. The facility must process Type 2 feedstocks in a timeframe that minimizes odors, release of feedstock liquids, fire and scavenging by vectors.
6. Feedstocks with free liquid shall be mixed with drier feedstocks, bulking material, or compost so that the liquid is promptly absorbed and not allowed to flow as free liquid from the compost piles or windrows. Free liquid that is not absorbed shall be managed as contact water and directed to a containment or treatment system.
7. By the end of each operating day, all incoming Type 2 feedstocks must be processed into the active composting pile, transferred to leak-proof containment, or mixed with bulking material and covered in a manner that minimizes nuisance odors and scavenging by vectors.
8. Contact water shall be directed to a containment, recycling, and/or treatment system.
9. Storage of finished compost on site is limited to 12 months of production, unless approved by the [state regulatory agency] on a case-specific basis.
10. Non-compostable waste shall be removed, stored in a waste container or containment area, and disposed of or recycled at a permitted solid waste facility in a timeframe approved in the CFOP (or as required by local regulating authority and/or as soon as the container is full).
11. Compost processing time and temperatures shall meet PFRP and vector attraction reduction requirements and produce compost that meets the stability necessary for the intended use (see *Section 8. Compost Testing*). Pathogen and vector attraction reduction compliance is achieved as follows:
    a. Windrow composting: the compost material must be maintained at a minimum average temperature of 55°C or higher for 15 days or longer. During the period when the compost is maintained at 55°C or higher, there shall be a minimum of

five turnings of the windrow with a minimum of three days between turnings. The 15 or more days at or above 55°C do not have to be continuous.

b. Aerated static pile or in-vessel composting process: Material maintained at a minimum average temperature of 55°C or higher for three consecutive days, followed by at least 14 days with a minimum of 45°C.

12. The composting area shall be maintained and repaired, as needed.
13. Records shall be maintained that identify the weight or volume of incoming feedstocks and outgoing finished compost, (see *Section 9. Annual Reporting*) as well as a summary of regulated analytical tests and process results on product and site monitoring results (if/as required). Records documenting compliance of the composting facility with the rules shall be kept for a minimum of three years from the date of the record and be in a form suitable for submission or inspection by the [state regulatory agency].
14. Notice of final closure must be provided to the Director within 270 days (or as specified by state requirements) of receiving the final load of material. Any site not operated on a seasonal basis only and not receiving material for 270 days shall be deemed abandoned and in violation of these rules unless properly closed. Notice of closure must include the date of final material receipt and a site closure plan for managing all feedstock and active, curing, and finished compost and compost-blended products remaining on the site. In addition, the plan must address how contact water stored in containment structures or ponds will be treated and/or removed. All material shall be removed from the facility within 270 days unless it is being utilized as part of site closure as described in the site closure plan.
15. The facility shall have a sign at the entrance of the facility that lists the following: name of facility; operating permit number; hours of operation; and emergency contact information.

## Section 6. Tier Three

I. Referenced Feedstock Category: Type 3 feedstocks include sludge, biosolids, diapers, and food processing residuals not covered in Type 2. Type 3 feedstock consists of these and other materials the department determines pose a higher level of risk to human health and the environment from physical and chemical contaminants and from human pathogens compared to Types 1 and 2 feedstocks.

II. Design and Operating Standards

A. Tier Three composting facilities may process Types 1, 2 and/or 3 feedstocks.

B. Tier Three composting facilities shall comply with design and operating standards for Tier Two composting facilities and the additional design and operating standards listed below:

1. Facilities that compost biosolids or sewage sludge shall comply with all applicable federal regulations regarding sludge management at 40 CFR 501[8]; 40 CFR 503[9]; and 40 CFR 503, Subpart B[10].

ALTERNATIVE A:

2. The receiving, mixing and active composting areas shall be constructed of an impermeable material such as concrete, asphalt, or similar approved impervious material to prevent the infiltration of contact water into the groundwater.

ALTERNATIVE B:

2. The working surfaces for all receiving, mixing, active composting and storage areas must be designed, constructed, and maintained to prevent conditions of contamination, pollution, and nuisance. All working surfaces must meet the following specifications:

a) All working surfaces must have a hydraulic conductivity of $1x10^{-5}$ cm/s or less, and meet one the following construction and material specifications:
   i. Asphalt concrete or Portland cement concrete designed to minimize the potential for cracking and to allow equipment to operate without damage;
   ii. Compacted clay, with a minimum thickness of one foot and protected from desiccation and installed in a manner such that the integrity will not be impaired by the operation of heavy equipment used at the composting and storage area; or
   iii. An equivalent engineered alternative.

[8] 54 FR 18786 (1989) https://www.ecfr.gov/current/title-40/chapter-I/subchapter-O/part-501

[9] 58 FR 9387 (1993) https://www.ecfr.gov/current/title-40/chapter-I/subchapter-O/part-503

[10] 58 FR 9387 (1993) https://www.ecfr.gov/current/title-40/part-503/subpart-B

## Section 7. Criteria for Siting a Composting Facility

I. Tier One, Two, and Three composting facilities shall comply with the following Siting Criteria:

A. The proposed facility will comply with all local zoning and land use ordinances.

B. The following buffers shall be maintained between the composting operation and the following features. [buffer distances to be determined by state regulatory agency]

1. the property lines. [X ft]
2. adjacent residences [X ft]
3. drinking water supply wells [X ft]
4. streams, lakes, or other bodies of water [X ft]
5. wetlands[1] [X ft]

[1]unless otherwise permitted by the United States Army Corps of Engineers

C. Location of a facility within a 100-year floodplain is discouraged. However, if it is sited within a 100-year flood plain, the facility shall not restrict the flow of the 100-year flood, reduce the storage capacity of the floodplain, or result in a washout of material from the facility's property.

## Section 8. Compost Testing

I. Tier Two and Three facilities shall meet the following test standards and requirements:

1. Samples and measurements taken for the purpose of product testing shall be representative of the composting activity and shall be conducted in a manner consistent with TMECC or other applicable standards pre-approved by [state regulatory agency].
2. The minimum number of samples that shall be collected and analyzed is shown below. Samples to be analyzed shall be composted prior to the analysis. Compost samples must be collected from *ready-to-sell* finished compost using **TMECC** compost sampling methods.

| Compost Quantity[1] | Frequency |
|---|---|
| 1 – 6200 tons/year | Must test every three months |
| 6201 – 17500 tons/year | Must test every two months |
| 17501 tons/year and above | Must test every month |

[1]Either the amount of finished compost applied to the land or prepared for sale or giveaway for application to the land (on an "as is" or "wet tons" (wet weight) basis)

3. All compost shall be tested for stability using one of the methods listed in TMECC 5.08, Respirometry.
    a. The stability results must be reported
4. All compost shall be tested for the presence of pathogens using the methods in TMECC 7.00, Pathogens.
    a. Either the density of fecal coliform in the finished compost shall be less than 1,000 Most Probable Number (MPN) per gram of total solids (dry weight basis), or the density of *Salmonella* sp. Bacteria in the finished compost shall be less than three MPN per four grams of total solids (dry weight basis) before the compost may be sold, given away or applied to the land.
5. All composts shall be analyzed for metals listed in 40 CFR, Section 503.13(b)(3), as amended using methods described in TMECC 4.00 Chemical Properties.

The concentration of metals in compost to be sold, given away or applied to the land shall not exceed the pollutant concentration (milligrams per kilogram) limits for Exceptional Quality compost as defined in the following table contained in 40 CFR, Section 503.13, Table 3

| Element | Concentration (mg/kg) |
|---|---|
| Arsenic | 41 |
| Cadmium | 39 |
| Copper | 1500 |
| Lead | 300 |
| Mercury | 17 |
| Nickel | 420 |
| Selenium | 100 |
| Zinc | 2800 |

Check your state's compost facility permitting website for a list of state accredited labs. The USCC provides a list of STA Approved Labs that can be found here: https://www.compostingcouncil.org/page/CertifiedLabs Additionally, the USCC provides a STA Program that uses independent STA Certified Labs for testing the above parameters. (See Appendix 4.B.1.)

## Section 9. Annual Reporting

I. Composting facilities subject to these rules must provide an annual report to [state regulatory agency], including the following data points:
    a. GPS coordinates of the permitted facility along with physical address.
    b. Days and hours of operation.
    c. Site managers contact information
    d. Method of Composting
    e. Feedstocks
        i. Annual listing of all feedstocks by type in tons. Conversion of bulk densities from cubic yards to tons can be obtained (See Appendix 4.B.2)
        ii. Site capacity in tons
        iii. Throughput in tons as defined in *Section 1. Definitions* of this rule
    f. Compost Produced
        i. Compost sold or distributed in tons
        ii. Compost inventory in tons

Note: States should collect this information electronically. Data should be aggregated and published for public distribution. (See Appendix 4.A.)

## Section 10. Training & Certification

I. Composting facilities should have at least one trained and certified operator on site at all times.

II. Composting facilities subject to these rules must be operated by an operator who has completed a composting operator training and has been certified by [state] or an independent professional organization in the field of composting.
    a. Training must include but is not limited to the following topics:
        i. Business Acumen
        ii. Composting Purpose and Vision
        iii. Composting Science
        iv. Equipment and Services Management
        v. Feedstock Management
        vi. Health and Safety
        vii. Process Control and Quality Assurance
        viii. Regulatory Compliance
        ix. Site Management

III. Operators must take and pass an Operator Exam to prove competence in the above subject matter.

IV. Operators must obtain Operator Certification to signify completion of training and passing of operator exam.

V. Operators must maintain certification by annually obtaining 10 hours of Professional Development Hours (PDH) by an accredited certifying agent.

VI. Operators must receive Operator Certification within the first year of supervising the facility.

## Section 11. Compost Facility Operations Plan

I. As noted in *Section 4. Tier One*, *Section 5. Tier Two*, and *Section 6. Tier Three* of this rule, all facilities composting Type 1, 2, or 3 feedstocks are required to develop and follow a Compost Facility Operations Plan.

II. A Compost Facility Operations Plan shall contain the following:

a. A description of the processes to be used, including estimated quantities of feedstocks, additives, and amendments.
b. A descriptive statement of the operations conducted at the facility.
c. A schematic drawing of the facility showing layout and general dimensions of all processes utilized in the production of compost including, but not limited to, unloading, storage, processing, parking, and loading areas.
d. A description of the proposed methods used to control contact water, litter, odors, dust, rodents, and insects, for example, how the operator will store, process, and incorporate food and source-separated organics into windrows or static piles, timeframes for inclusion of material, collection and containment of contact water, passive and active vector controls, methods to monitor effectiveness of control measures.
e. A description of the proposed emergency provisions for equipment breakdown or power failure.
f. A description of the storage capacity, feedstock pile sizes, and anticipated maximum and average length of time compostable materials will be stored at the facility.
g. A description of compostable materials handling equipment used at the facility including type, capacity, and number of units.
h. Anticipated annual operation capacity for the facility (in tons).
i. A description of provisions to handle unusual peak loadings.
j. A description of the proposed method for storage and final disposal of non-recoverable or nonmarketable materials.
k. A description of the water supplies required to process water.
l. Identification of person(s) responsible for oversight of facility operations.
m. A description of the proposed site restoration activities.
n. An Odor Impact Minimization Plan -

1. Odor impact minimization plans shall provide guidance to on-site operation personnel by describing, at a minimum, the following items:

a) an odor monitoring and data collection protocol for on-site odor sources, which describes the proximity of possible odor receptors and a method for assessing odor impacts at the locations of the possible odor receptors; and,
b) a description of meteorological conditions affecting migration of odors and/or transport of odor-causing material off-site. Seasonal variations that affect wind velocity and direction shall also be described; and,
c) a complaint response and recordkeeping protocol; and,

d) a description of design considerations and/or projected ranges of optimal operation to be employed in minimizing odor, including:
    1. method and degree of aeration;
    2. moisture content of materials;
    3. feedstock characteristics;
    4. airborne emission production;
    5. process water distribution;
    6. pad and site drainage and permeability;
    7. equipment reliability;
    8. personnel training;
    9. weather event impacts;
    10. utility service interruptions;
    11. and site-specific concerns as applicable; and,
e) a description of operating procedures for minimizing odor, including:
    1. Aeration;
    2. moisture management;
    3. feedstock quality;
    4. drainage controls;
    5. pad maintenance;
    6. wastewater pond controls;
    7. storage practices (e.g., storage time and pile geometry);
    8. contingency plans (i.e., equipment, water, power, and personnel);
    9. biofiltration; and
    10. tarping, as applicable.

III. If the operator is omitting any of these procedures, the plan shall explain why it is not necessary.

## Appendix

Appendix 1: Definitions Supplement

The USCC creates and updates the MCRT to standardize state regulations for composting. Part of that standardization process includes consistent use of terminology. Another part of this standardization process and a key objective in creating the MCRT is to separate composting regulations from solid waste management regulations. Appendix 1 attempts to provide rationale for excluding certain terms, clarification around how defined terms relate to each other, and synonyms for terms the USCC has defined in the MCRT that appear in existing state composting regulations.

### 1.A. Intentional Omissions

#### 1. Waste

The word "waste" is not used in the MCRT. While the USCC and the collaborators involved in the crafting of this model rule recognize that the term waste is often used in rule making and is commonly known, the term carries important implications that the compost community wanted to avoid. Instead of "waste", this rule exclusively uses the term "residuals" to indicate that the raw materials going into the manufacture of compost are resources that can be converted into valuable products via the process of composting. The term "waste" is still used when referring to waste that has been so called waste by the industry that generates/manages it (e.g., hazardous waste, wastewater, solid waste, those listed in prohibited feedstocks, and when referring to non-compostable materials). However, when referring to materials that can be composted, the term "residuals" is exclusively used.

#### 2. Leachate

During the drafting of Tier Two, the Task Force had detailed discussion on use of the term "leachate" as it related to the composting process. The term leachate, in the context of solid waste management, originated in regulatory language for landfills, and was carried over into state solid waste composting rules — even though the make-up of landfill leachate is significantly different than what is generated at a composting facility, and therefore would require different handling. To account for this important difference, several states have used "contact water" instead of "leachate" in their compost rules. The MCRT also uses "contact water" as opposed to "leachate" to describe water that has come in contact with raw feedstocks in the tipping and mixing area(s) and active composting piles. This rule also defines water that has come into contact with finished compost or curing materials (stormwater) and water that has not come into contact with any raw feedstocks or finished compost (run-off). These differences are further described in Section 1.B.1.a. of this appendix.

### 1.B. Term Clarifications

1. Term Families

    a. Stormwater, Contact Water, Run-off, and Run-on

As mentioned above, water that has come into contact with different materials at a compost facility, and therefore carries extracted, dissolved, or suspended materials from what it came into contact with, is referred to by different names. This discrepancy is important as the responsible way to handle liquids that flow through a compost facility differs based on what they have come into contact with. In this rule, “run-on” describes water that is flowing on to a facility, before coming into contact with anything and turning into “run-off”, “contact water”, or “stormwater”. “Run-on” is important as managing “run-on” reduces liquids that would run off.

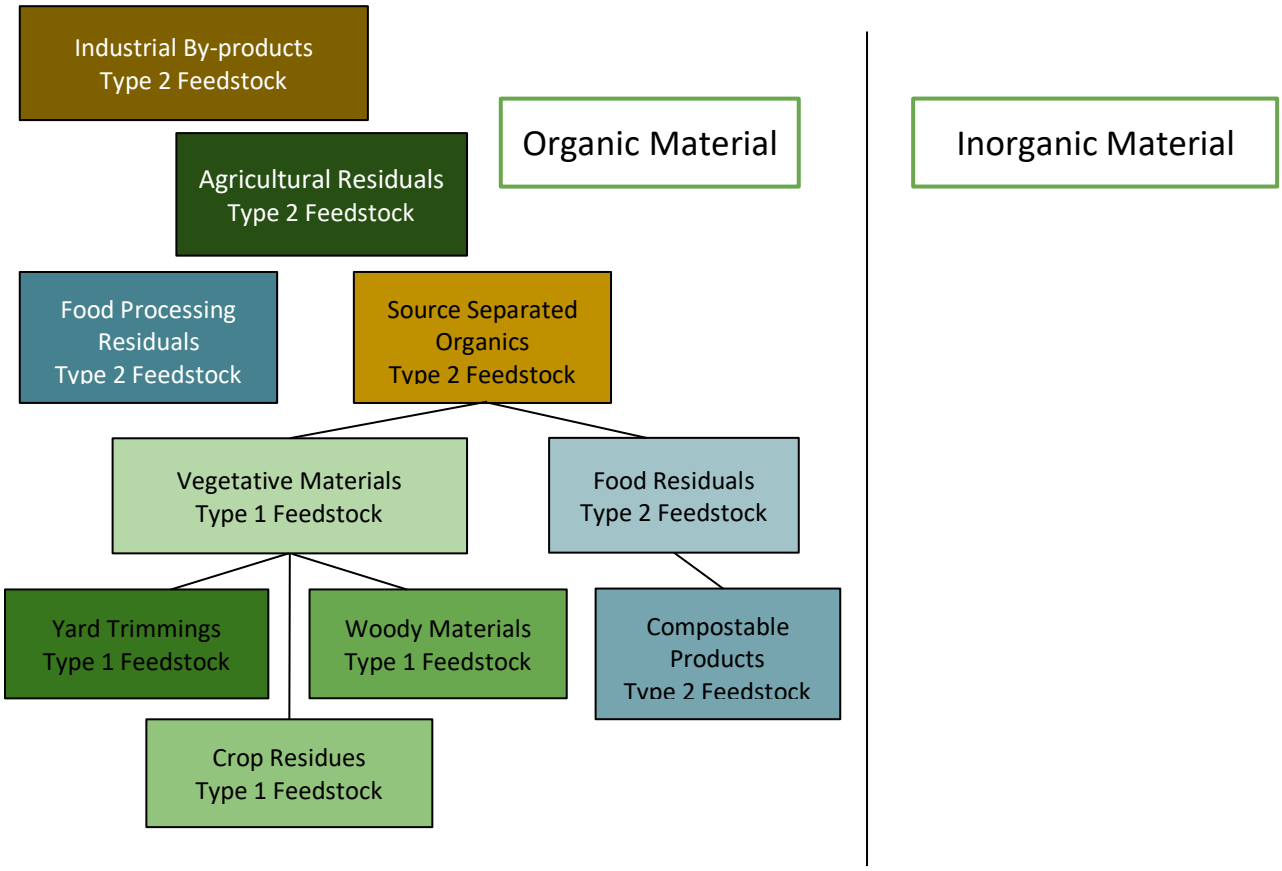
While the liquid that would emerge from any materials at a compost facility would not contain the contaminants that could be found in landfill leachate, liquid that has come into contact with feedstock before it has completed the full composting process (where pathogens and disease vectors are completely destroyed) may still carry contaminants and should be controlled accordingly. This type of liquid is referred to as “contact water”. Water that has come into contact with only finished compost and product storage piles should not contain contaminants (as they would have been eliminated in the compost process) and is therefore referred to as “stormwater” as this water still requires management. Finally, “run-off” describes water that has not come into contact with any materials and is simply water that would flow over the facility.

    b. Source-separated Organics, Vegetative Materials, Food Residuals, Food Processing Residuals, Agricultural Residuals, and Industrial By-products

These terms all describe feedstocks but have important differences that deserve highlighting as the materials they describe require differing levels of management and are regulated differently. “Source-separated organics” is an overarching term for organic material that has been separated from non-compostable materials. These materials can be further broken out into different sub-categories, and those sub-categories that are defined in this rule are “vegetative materials”, “yard trimmings”, “woody materials”, and “crop residues”, “food residuals”, and “compostable products”. “Yard trimmings”, “woody materials”, and “crop residues” are all considered “vegetative materials” more broadly and “compostable products” can fall under the category of “food residuals”.

“Source-separated organics”, as a general category, is considered a Type 2 feedstock due to the fact that “source-separated organics” includes “food residuals” and “compostable products”, both of which are Type 2 feedstocks. But the subcategories “vegetative materials”, “yard trimmings”, “woody materials”, and “crop residues” are considered Type 1 feedstocks.

"Food processing residuals", "agricultural residuals" and "industrial by-products" are material categories that may have some of the same residuals as those listed above but are differentiated based on where they originate.




c. Curing, Stability, and Maturity

"Maturity" and "stability" are both characteristics of finished compost. These characteristics, among others, help to determine the best use for that batch. Maturity is the degree or level of completeness of composting. Maturity is not described by a single property and therefore, maturity is best assessed by measuring two or more compost characteristics. Some immature composts may contain high amounts of free ammonia, certain organic acids or other water-soluble compounds which can limit seed germination and root development, or cause odor. All uses of compost require a mature product free of these potentially phytotoxic components. The bioassay used in the STA Certified Compost Program uses a seed germination and growth test to measure the percent of seed emergence and relative seedling vigor. Immature compost top-dressed on soil is not recommended for immediately directly sowing seeds.

"Stability" refers to a specific stage or state of organic matter decomposition during composting, which is related to the type of organic compounds remaining and the resultant biological activity in the material. The stability of a given compost is important in determining the potential impact of the material on nitrogen availability in soil or growth media and maintaining consistent volume and porosity in container growth

media. Stable compost consumes little nitrogen and oxygen and generates little CO2 or heat. Unstable, active compost demands nitrogen when applied to soil and growth media. While not every end use requires that the finished compost is "stable", most uses of compost require a stable to very stable product that will prevent nutrient tie-up and maintain or enhance oxygen availability in soil or growth media. A mature compost pile is generally considered to be stable.

"Curing" is the process by which "maturity" can be reached. The degree to which a compost pile has been cured can determine the pile's degree of maturity.

2. Synonyms

    a. Food residuals - 'food scraps', 'pre/post-consumer food residuals'

In some existing state composting regulations, "food residuals" are referred to as 'food scraps' and 'pre/post-consumer food residuals'. USCC feels that the term 'residuals' provides a more descriptive name for those food products that are not consumed and can be used as feedstock than the term 'scraps' does. Residuals imply that these byproducts are still resources. USCC uses "food residuals" as opposed to 'pre/post-consumer food residuals' for brevity's sake. Despite the preference for "food residuals", the synonyms listed are adequate and show up in existing state regulation.

    b. Throughput - 'process rate'

"Throughput" is sometimes referred to as 'process rate' in existing state regulations. USCC notes that both terms are adequate but promotes the use of "throughput" for standardization purposes.

    c. Yard trimmings - 'green waste' and 'yard waste'

"Yard trimmings" appear in existing state regulations but are occasionally referred to as 'green waste' or 'yard waste'. USCC advocates for the avoidance of the term 'waste' when referring to feedstock as compost feedstock is a resource rather than a waste product and should be regulated and referred to as such.

3. General

    a. Community Composting

BioCycle defines "Community Composting" as "an environmental movement involving initiatives in a wide range of communities to close the loop on organics recovery. At its core, community composting is on a scale bigger than household composting and smaller than typical commercial composting and seeks to keep organics in a loop as local as resources allow. But otherwise, community composting can be defined in many ways." USCC has defined "Community Composting" in this MCRT using the definition provided by California ("SLCP: Organic Waste Reductions Regulation Text", Section 18982 (8).) as California's definition includes descriptive

parameters, but USCC recognizes that "Community Composting" can be defined in many ways and, therefore, states should use their own discretion in defining.

## Appendix 2: Exemptions Supplement

### 2.A. General Note on Exemptions

During rule development there was extensive discussion about whether to include receipt of off-site feedstocks in the agricultural exemption. The USCC and the composting community discussed the trade-off between supporting composting activities by reducing regulatory burden, and prioritizing preventing negligence and irresponsible handling of feedstock that could threaten the integrity of composting. While off-site feedstock will not be included in the MCRT 2.0 Agricultural Exemption, off-site feedstock could be accepted by animal and crop production operations and qualify for the Agricultural Exemption as long as Best Management Practices, such as completion of a Compost Operator Training program and annually reporting of feedstock according to *Section 9. Annual Reporting* of this rule, are adopted. Terms of these exemptions are left to states' discretion, but it is important that this tradeoff is considered as Composting Rules are created, adopted, and enforced.

### 2.B. Exemption Clarifications

1. Small Scale Exemption

A space is left here to accommodate the fact that different quantities of feedstock may qualify for a state-authorized small-scale exemption depending on the composting method used. Stakeholders discussed that nuisance avoidance is not only achieved by limiting feedstock quantity, but also through the method selected. Therefore, the MCRT has left these spaces for states to use their own discretion when defining Small Scale Exemption terms in the case of different composting methods.

## Appendix 3: Tiered Regulations Supplement

### 3.A. Best Management Practices

The USCC recognizes that the next necessary resource for compost facility operators and regulators is a Best Management Practices resource. The limitations of model rules are that regulation text is largely limited to defining what must be done and what cannot be done, however, there are many management practices that can make compliance more accessible and regulating more efficient. While the MCRT is designed for regulations, USCC plans to publish Best Management Practices in the near future.

### 3.B. General Supplementary Information

1. Best Management Practices for Water Management at Composting Facilities

While Best Management Practices must be designed in accordance with state-specific guidelines for stormwater control that may vary depending on the type and/or location of the facility, USCC has developed a set of Water Management Practices for Composting Facilities that can act as a guide:

Site Design

- Prevent site from stormwater run-on by using berms or swales
- Locate feedstock receiving, storage and preparation areas on stable pads with slopes of 1 to 2 percent to prevent ponding and to convey contact water to capture and store
- Sloping should be stabilized and limited to prevent erosion
- Line storage areas with crushed rock or compacted gravel to minimize discharge and provide sediment and erosion control.
- Practice good housekeeping measures such as frequent removal of debris, bark, and wood waste. Cleanup methods may include scrapers or front-end loader buckets
- Use sedimentation measures to control sediment from leaving storage area such as check dams
- Cover nitrogenous feedstock piles to prevent contact with stormwater (use roofs, canopies, soils, sheds, etc.)

Carbon Feedstocks - (yard trimmings and woody materials)

- Consolidate piles to minimize surface areas exposed to precipitation
- Surround ground carbon feedstocks with mulch berms

Nitrogenous Feedstocks - (manures, food and food processing residuals, vegetative materials and biosolids)

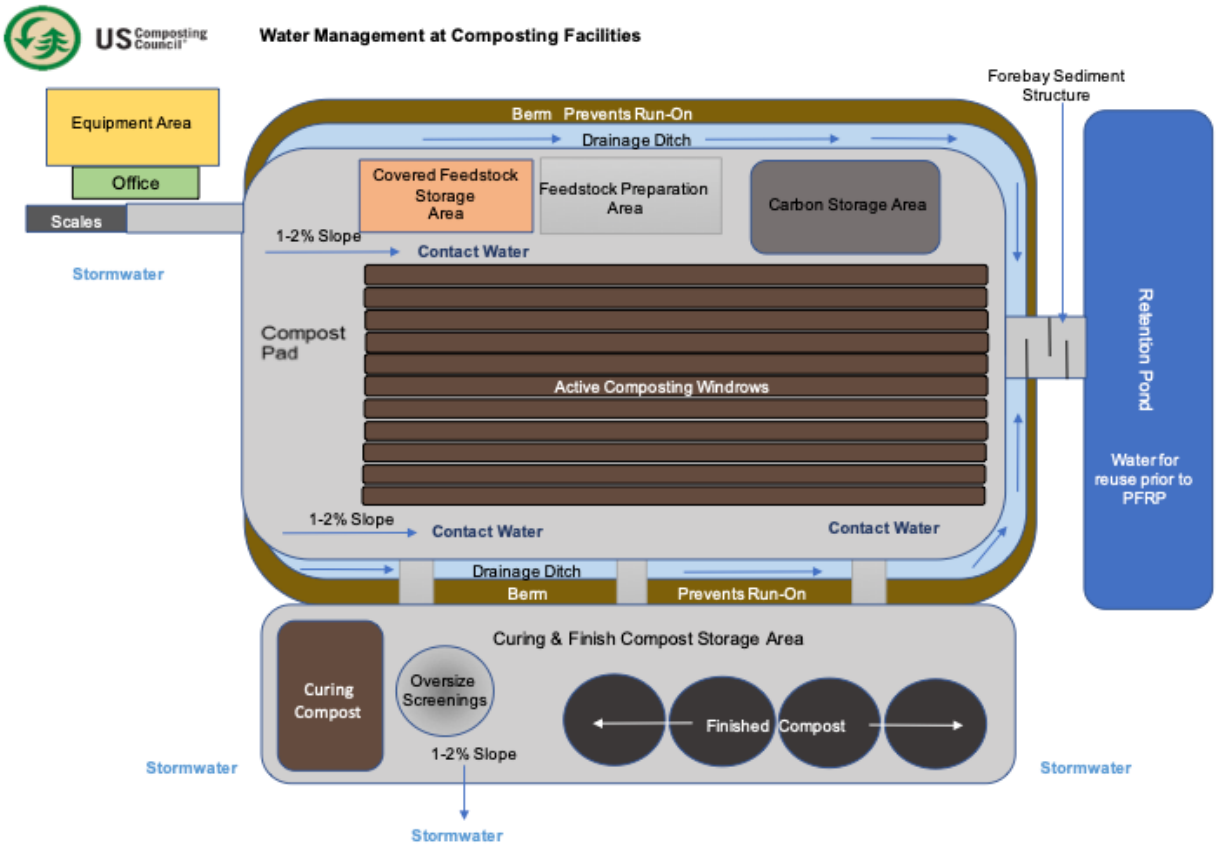
- Locate unloading and storage areas indoors or cover
- Confine unloading activities to designated areas that capture any run-off
- For liquid or semi-liquid materials, use a concrete lined basin with a dead-end sump where materials could be captured for reuse.
- Avoid unloading materials in the rain or provide cover
- Provide diversion berms or grassed swales around the perimeter of the area to limit run-on

Active Composting Areas

- Slope compost pad to drain contact water to drainage ditches and or grassed swales around the perimeter of the area to forebay structure and on to capture at the retention pond for reuse

Compost Curing and Finish Product Storage - (bulk)

- Provide diversion berms or grassed swales around the perimeter of the area to limit run-on




2. Design Plan

A Compost Facility Design Plan is intended to be submitted prior to construction. While the Compost Facility Operations Plan can be seen as the permit to operate, the Design Plan can be seen as the permit to construct. Some of the information contained in these plans may overlap, but they serve different purposes and are therefore independently necessary.

The information required in a typical Compost Facility Design Plan is as follows:

1. List the types of feedstocks, residuals, bulking materials, and amendments to be accepted
2. Specify whether feedstocks and residuals will be accepted from the general public.
    a. Provide specific descriptions for all materials.
    b. Provide the sources of all materials.
    c. If some materials are generated onsite, provide a description.

    d. Analytical data may be required for materials that could contain metals or other contaminants, such as commercial or industrial by-products.
3. Provide an estimate of the total amount of materials to be received at the facility per day, week, or month, in tons or cubic yards.
    a. Provide a general amount for the types of feedstocks, carbon, or nitrogen, to be received, per day, week, or month.
    b. Describe any seasonal variation for any of the materials.
    c. Design capacity of the facility. The site capacity is the incoming volume, or throughput, per year, and is based on the compost method, duration of the process, and the size of the facility and show calculations.
4. For Type 1 and Type 2 operations, describe a plan for balancing the carbon and nitrogen ratio. For Type 3 operations, provide carbon to nitrogen ratio (C:N) testing and calculations. Describe and provide compost recipes.
5. A process flow diagram of the entire facility, including the type, size, and location of all major equipment, and feedstock flow streams. The flow streams should indicate the quantity of materials on a wet weight and volumetric basis.
6. Design and testing of a constructed pad, if needed to meet alternative soil texture requirements or distance to groundwater.
7. Grading and sloping of site surfaces to prevent ponding of water.
8. The equipment means for measuring, shredding, mixing, and proportioning input materials.
9. Anticipated process duration time, including receiving, preparation, composting, curing, and distribution.
10. Location of all temperature, air and any other type of monitoring points, probe depth, and the frequency of monitoring.
11. How the temperature control and monitoring equipment will demonstrate that the facility meets the requirements of the Process to Further Reduce Pathogens (PFRP), as appropriate for the feedstock.
12. The method of aeration provided and the capacity of aeration equipment.
13. For outdoor facilities, surface water control features, including run-on and run-off. Describe plan for operation of the facility in wet weather. Surface water must be diverted from the operational, compost curing, and storage areas. For sites that will have run-off from the facility operation, a stormwater/wastewater permit will most likely be required.
14. Contact water may either be collected and disposed of separately, or for some facilities, it is possible that it may be combined with clean surface water run-off for discharge from the site with a stormwater/wastewater permit. Describe the collection, storage, and disposal of process water. Disposal could involve connection with a sanitary sewer line, or collection in a holding tank, with the liquid periodically pumped and removed from the site for proper disposal.
15. Plans and specifications for the facility, including manufacturer's performance data for all equipment selected.
16. Describe any amendments to be added to the finished compost, if applicable, including the amount. For ash, provide analytical data. Describe storage of the amendments, maximum pile size, and methods to prevent surface water run-on

and run-off, if applicable. It should be stated that samples for required compost metals analysis will be taken from the compost with the amendments added.

17. For Type 2 and Type 3 facilities:
    a. description and sizing of the storage facilities for amendment, bulking agent, solid waste, recyclables, household hazardous waste and finished compost.
    b. A description of the air emission and control technologies. Examples include an air mist or the application of 3 to 6 inches of cover over piles. For indoor facilities, describe how particulates are minimized.
    c. A description of any recycling or other material handling processes used at the facility.

Appendix 4: Testing, Reporting, Training & Certification Supplement

4.A. Importance of Reporting

The MCRT 2.0 includes Reporting Requirements as reporting composting facility and composting practices information is necessary for data collection and the expansion and promotion of composting. With the data collected through annual reporting, the USCC and others can promote composting infrastructure by providing metrics that justify greenhouse gas avoidance through composting practices, landfill area saved, water bodies protected, jobs generated, and the general economic stimulation seen as a result of this industry growth. Providing these metrics can be used to apply for grants and loans that may be used for infrastructure and for research and education which can continue to fuel further funding and growth. Additionally, data can inform the development of elements within the composting industry such as the manufacturing and composting of compostable products and inform Best Management Practices more broadly.

4.B. General Supplementary Information

1. USCC Seal of Testing Program

The USCC provides an information disclosure program that was developed and managed by the USCC. This testing program provides all the testing parameters shown in 8.I above, with the addition of the following testing parameters:

Inerts
Macronutrients & Micronutrients
Moisture Content
Maturity (Bioassay)
Organic Matter Content
Pathogens
Particle Size (Gradation)
pH
Stability

Soluble Salts (Electrical Conductivity - EC)
Trace Metals

The STA Program uses independent STA Certified Labs that follow the TMECC testing protocols and ASTM standards. Participation in this program requires meeting the EPA testing limits for heavy metals and pathogens. Participants must agree to comply with the sampling protocol, chain of custody form, testing frequency, providing instructions for use, STA logo use and signing an annual enrollment agreement. Test results are presented on a Compost Technical Data Sheet (CTDS) listing pass fail on pathogen and metals along with the analytical data listed above.

https://www.compostingcouncil.org/page/CompostManufacturersSTA

2. Unit Conversion Chart

To facilitate the standardization and aggregation of data collected through reporting, USCC encourages all facilities to report feedstock, capacity, and product data in tons. Recognizing that not all facilities have scales and therefore are limited to reporting sizes in cubic feet or cubic yards, facilities can reference this Unit Conversion Chart to convert their measurements to tons for reporting purposes.

| Feedstock Material | Bulk Density (lbs/cubic yard) | Bulk Density (kgs/m3) |
|---|---|---|
| **Crop Residues & Fruit/Vegtable-Processing Residuals** | | |
| Apple filter cake | 1,197 | 710 |
| Apple pomace | 1,559 | 925 |
| Apple-processing sludge | 1,411 | 837 |
| Cocoa shells | 798 | 473 |
| Corn cobs | 557 | 330 |
| Corn stalks | 32 | 19 |
| Cotton gin trash | 185 | 110 |
| Cranberry filter cake | 1,021 | 606 |
| Cranberry filter cake w/ rice hulls | 1,298 | 770 |
| Cull potatoes | 1,540 | 914 |
| Potato-processing sludge Potato tops | 1,570 | 931 |
| Rice hulls (RANGE) | 200 | 120 |
| Rice hulls | 202 | 120 |
| Sugarcane bagasse | 324 | 192 |
| Sugarcane filter press mud | 1,200 | 712 |
| Vegetable produce | 1,585 | 940 |
| **Fish and Meat Processing** | | |
| Crab and lobster residuals | 240 | 142 |
| Paunch manure | 1,460 | 866 |
| **Manures** | | |
| Broiler litter (RANGE) | 756-1,026 | - |
| Broiler litter | 864 | 513 |
| Cattle (RANGE) | 1,323-1,674 | - |
| Cattle manure | 1,458 | 865 |
| Horse-general manure (RANGE) | 1,215-1,620 | - |
| Horse-general manure | 1,379 | 818 |
| Laying hens manure | 1,479 | 877 |
| Turkey litter | 783 | 465 |
| **Municipal Residuals** | | |
| Food residuals | 1,585 | 940 |
| Sewage sludge (RANGE) | 1,075-1,750 | - |

| | | |
|---|---|---|
| **Straw, Hay, Silage** | | |
| Straw-general {RANGE) | 58-378 | - |
| Straw-general | 227 | 135 |
| Straw-oat | 227 | 135 |
| Straw-wheat | 227 | 135 |
| **Wood & Paper** | | |
| Corrugated cardboard | 259 | 154 |
| Newsprint | 219 | 130 |
| Paper fiber sludge | 1,140 | 676 |
| Paper pulp | 1,403 | 832 |
| Sawdust (RANGE) | 350-450 | - |
| Sawdust | 410 | 243 |
| Telephone books | 250 | 148 |
| Wood chips | 533 | 316 |
| Hardwood (chips, shavings, etc.} | 533 | 316 |
| Softwood (chips, shavings, etc.) | 533 | 316 |
| **Yard Residuals & Other Vegetation**** | | |
| Grass clippings, Loose | 350 | 208 |
| Grass clippings, Compacted | 650 | 386 |
| Leaves, Loose and dry | 200 | 119 |
| Leaves, Compacted and moist | 450 | 267 |
| Shrub trimmings | 429 | 255 |
| Tree trimmings | 1,296 | 769 |
| Water hyacinth-fresh | 405 | 240 |
| Water | 1,682 | 998 |
| Urine | 1,722 | 1,022 |

*Prior to incorporating materials from a residuals water treatment system into a compost, they must first be analyzed for heavy metals that can pose serious health concerns. Septic materials must be declared safe in order to be used for composting. The septic must be pumped out into a screen to remove the solids from the liquids. Store the solids in a contained area e.g., a pit, and the liquid in a separate container e.g., a tank. Be sure to wear Personal Protective Equipment (PPE) to avoid contact with any pathogens.

**When using hay, yard residuals, leaves, and grass clipping, make sure they are not treated with persistent herbicides.