

# HB 1033 Advisory Council – Meeting 3 Packet Dec. 5, 2023

## Meeting Goals

- Finalize operating procedures.
- Determine next steps to define compostable products.
- Confirm updated research plan and outline information requests.
- Review literature review results and discuss findings; begin challenge identification process.

## Date & Time

- Tuesday December 5, 10am-12pm, [Zoom](#)

## Meeting Packet

- Agenda
- Updated operating procedures
- Literature review memo

# Agenda Overview

Total duration = 120 minutes

Duration	Agenda Item
10 min	Welcome, agenda, & objectives
10 min	Confirm draft operating procedures
25 min	Determine next steps to define compostable products.
20 min	Confirm updated research plan and outline information requests
45 min	<p>Review literature review results and discuss findings; begin challenge identification process:</p> <ul style="list-style-type: none"> <li>• What does this research tell us about what is working to achieve <i>“the state’s goal of managing organic materials, including food waste, in an environmentally sustainable way that increases food waste diversion and ensure that finished compost is clean and marketable?”</i></li> <li>• What does it tell us about what is not working to achieve the state’s goal?</li> <li>• Where do we see opportunities and barriers to improve compostable products management in Washington state?</li> <li>• In what areas do we still need more information to move this committee’s work forward?</li> <li>• Are there findings that do not align with your experience? If so, what is the difference?</li> </ul>
5 min	Public comment
5 min	Closing remarks and preview next steps



# Draft Operating Procedures

## Compostable Products Advisory Committee

Prepared by Cascadia Consulting Group, Inc.

Updates since November 7, 2023 are in red text



## 1.1 Purpose and charge for the Compostable Products Advisory Committee

### Background and Advisory Committee Mission

In an effort to reduce the generation of methane gas in landfills, WA State seeks to increase diversion of organic materials to compost and other organic materials management facilities. The legislature finds that there is an urgency in developing stronger organics material management practices to ensure that compost streams are limited to compostable organic materials and not obstructed by unsuitable contaminants. Currently, organic materials management facilities in WA vary in types of feedstock they accept.

### Advisory Committee Purpose

WA State legislation RCW 70A.205.720 calls for the development of standards for the management of compostable products and an effort to increase diversion of organic materials away from landfills. The legislation calls for an Advisory Committee (“Committee”) which shall **make recommendations to the appropriate committees of the legislature on the development of standards for the management of compostable products, especially food service products, by composting and other organic materials management facilities.**

## 1.2 Roles and Responsibilities

### Committee Members

The Committee is comprised of a diverse membership. Committee members should consider diverse perspectives and work to find common ground. Details of member composition can be found in **Advisory Committee Member Composition**. Committee members were selected based on requirements from the legislation. The complete list of members can be found in **Appendix A. Full List of Advisory Committee Members**.

The Committee will be responsible for making recommendations on the management of compostable products to the legislature. In establishing these recommendations, the Committee will approve the research plan and provide any knowledge they have from their respected fields. Honesty, mutual respect, civility, and common courtesy should underscore all discussions. Committee members are expected to listen, ask questions, learn from each other, and create a problem-solving atmosphere. The Compostable

Products Committee will meet monthly for 2-hour sessions using remote meeting tools. Meetings will commence early October 2023 and continue through July 2024, as the Committee develops recommendations to deliver to the legislature by September 15, 2024.

Committee members will:

- Come prepared to fully and constructively participate in Committee discussions, including reviewing and discussing information and research topics presented by Department of Ecology staff and Cascadia Consultants.
- Following meetings, review the draft meeting summary and share any concerns or edits with all Committee members and Cascadia, via email.
- Work between meeting to educate themselves on research topics, including reviewing research done by Cascadia and by collecting requested information.
- Work cooperatively with each other, the facilitator, and Department of Ecology staff to accomplish the purpose of the Committee (See **Advisory Committee Purpose**). Inform the facilitator of any concerns or suggestions about meeting agendas and management of discussions and support changes in our approach that allow the group to accomplish its goals and purposes.
- Provide consensus-based recommendation, guidance, and goals to help inform the development of Compostable Products management to the legislature by September 15, 2024.
- Follow community agreements (See **Appendix B. Community Agreements**).
- **Commit to attending all meetings, as possible, as there are no assigned alternates. If not able to attend a meeting, alert Cascadia in advance if possible or connect with Cascadia after the meeting so that facilitators can document Committee member perspectives and/or votes.**

## Department of Ecology

One Department of Ecology staff member will participate in each Committee meeting. Department of Ecology staff will:

- Review Committee meeting agendas.
- Respond to information requests as needed.
- Upload meeting agendas and summaries to EZ View.
- Provide additional support as requested by Committee members and consultants as time and resources allow.

## Facilitation Team

As per the legislation, a facilitation team, Cascadia Consulting Group (“Cascadia”), is responsible for convening the stakeholder Committee meetings, conducting research of relevant information regarding issues associated with compostable products and the management of compostable materials, providing staff and support to stakeholder advisory meetings, drafting reports and other materials for review by the Committee, and submitting the final report on the Committee’s recommendations for the management of compostable products by September 15, 2024.

As facilitators, the Cascadia team will:

- Consistently communicate with the Committee about upcoming meetings.
- Develop the meeting agenda and associated meeting packet to be distributed one week before Committee meetings.
- Keep the group focused on the monthly agenda.
- Suggest alternative methods and procedures to move forward when necessary.
- Encourage participation by all Committee members.
- Halt or redirect dialogue that is disrespectful, off-topic, or dominating the conversation to allow others to participate effectively.
- Ensure that Committee members and other meeting participants adhere to the ground rules found in **Appendix B. Community Agreements**.
- Develop a final report to the legislatures, as per Committee discussions/decisions.

The research topics covered by Cascadia will include, but are not limited to, the topics identified in the legislation (HB 1033) (See **Topics**). The intent of the research is to provide fact-based information to the Committee that is grounded in data to help address issues that are often complex and contentious.

## 1.3 Advisory Committee Member Composition

Committee member composition was determined as part of HB 1033, which called for at least one member from each of the following:

- Cities, including both small and large cities and cities located in urban and rural counties, which may be represented by an association that represents cities in Washington

- Counties, including both small and large counties and urban and rural counties, which may be represented by an association that represents county solid waste managers in Washington
- Municipal collectors or companies that provide curbside organic materials management services under a municipal contract under RCW 35.21.120
- A solid waste collection company regulated under chapter 81.77 RCW that provides curbside organic materials collection services
- Three organic materials management facility operators, including at least one operator of a facility that does not currently accept compostable food service products and one operator of a facility that does currently accept such products
- A representative from an environmental nonprofit organization that specializes in waste and recycling issues
- Two manufacturers of compostable products, including at least one manufacturer of compostable food service products and one manufacturer of compostable plastic food service products
- One distributor of compostable food service products
- A statewide general business trade association
- A representative from a retail grocery association
- Two organizations that act as third-party certifiers of compostable products
- The department of agriculture
- Two associations focused on organic materials recycling or composting
- A statewide organization representing hospitality businesses

Legislation also requires all interested tribal parties be invited to join the Committee.

A full list of Committee members can be found in **Appendix A. Full List of Advisory Committee Members**.

## 1.4 Working Definition for Compostable Products

The following proposed working definition for compostable products is already encompassed in Washington state law (RCW [70A.455.040](#) Requirements for a product labeled "compostable"):

(1) A product labeled as "compostable" that is sold, offered for sale, or distributed for use in Washington by a producer must:

- (a) Meet ASTM standard specification D6400;
- (b) Meet ASTM standard specification D6868; or
- (c) Be comprised of wood, which includes renewable wood, or fiber-based substrate only.

Committee members may create a working group, facilitated by Cascadia, to refine the working definition.

## 1.5 Decision Making and Voting

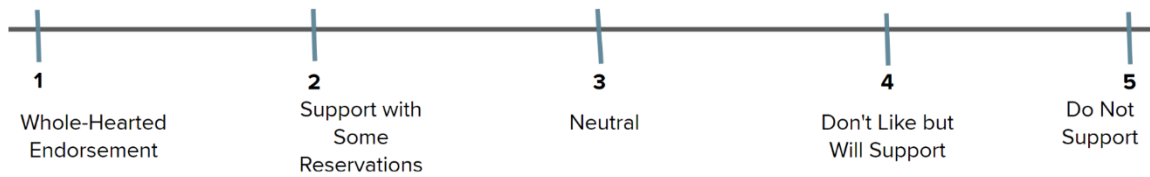
Committee Members will have robust conversations sharing their perspective and taking note of others' perspectives. Emerging discussions will be documented in meeting summaries, highlighting consensus agreements, emerging agreement areas, and disagreements and concerns. This approach permits the Committee to gather additional information and ideas between the first discussion and a final group decision on each topic.

**Documenting levels of agreement:** The Committee shall make recommendations using consensus-based decision making. The final report must include recommendations where general stakeholder consensus has been achieved and note dissenting opinions where stakeholder consensus has not been achieved. The facilitation team will utilize the gradient of agreement scale to ensure that all Committee members have a voice in decision-making and are able to express their position. This framework will help the facilitation team know where more dialogue is necessary and ultimately, build solutions that have broad support. The meeting summary will record decisions. When members make statements about their decisions, or if dissenting opinions are raised, the meeting summary will document those.

The gradient of agreement includes:

1. Whole-hearted endorsement
2. Support with Some Reservation
3. Neutral
4. Don't Like but Will Support
5. **Do Not Support**





**Approval of recommendations:** Committee members agree to forward a recommendation to Department of Ecology and the WA State legislature along with, as applicable, documentation about concerns related to the decision.

The consultant team will draft the report to the legislature based on Committee recommendations. All Committee members must review and agree that the final report represents their perspective. Committee members should see any concerns clearly and accurately articulated in the record.

## 1.6 Replacement of Members

Advisory Committee members may need to leave their role on the Committee due to a change in professional role or due to personal circumstances. In the event of a departure from the Committee:

- If the departure is before the March 2024 Committee meeting, Ecology will accept nominations for a replacement from members of the Committee. Ecology will make the final determination to extend an invitation to a new Committee member.
- If the departure is after the March 2024 Committee meeting, Ecology will not seek a replacement Committee member. This policy reflects that it is important for Advisory Committee members to be informed and present in discussions throughout the facilitated process.

## 1.7 Communications

Meeting agendas will be available one week ahead of each meeting. Meeting summaries will be posted one week following each meeting. Each will be posted on the Department of Ecology's EZ View website:

[https://www.ezview.wa.gov/site/alias\\_1962/37917/compostable\\_products\\_advisory\\_committee.aspx](https://www.ezview.wa.gov/site/alias_1962/37917/compostable_products_advisory_committee.aspx)

## 1.8 Public Comments

The public can participate in the process by:

- Attending Committee meetings and: 1) adding a comment to the chat box anytime throughout the meeting, or 2) making a verbal comment during the comment period at the end of each meeting.
- Contacting a member of the Committee.
- Contacting the organics email address: [organics@ecy.wa.gov](mailto:organics@ecy.wa.gov).

## 1.9 Topics

In supporting Committee recommendations on the management of compostable products, the legislation outlines the following research areas for focus:

- The state's goals of managing organic materials, including food waste, in an environmentally sustainable way that increases food waste diversion and ensures that finished compost is clean and marketable, with the intent of being consistent with and furthering the improvements identified in chapter 180, Laws of 2022
- The types of compostable products, and amounts if known, sold or distributed into WA
- Consumer confusion caused by noncompostable products that can lead to contamination issues
- Compostable standards related to the breakdown of products in facilities and home composting
- The status of acceptance of compostable products by organic materials management facilities in WA, including consideration of organic certifications
- Estimates of the percentage of compostable products used in WA that are disposed of at organic materials management facilities
- Financial incentives for organic materials management facilities accepting compostable products
- Current laws related to compostable products and the enforcement of these laws
- Any work product from other contemporaneous stakeholder committees currently discussing similar topics in other jurisdictions or nationwide
- Policy options addressing contamination of organic waste streams and to increase the use of reusable and refillable items

Cascadia Consulting will assist the Committee with research needs through a literature review, organic materials management facility interviews, written information requests to the Committee, and desktop research and interviews.

## 1.10 Appendices

### Appendix A. Full List of Advisory Committee Members

Name	Affiliation	Contact
Kate Kurtz	City of Seattle	<a href="mailto:Kate.Kurtz@seattle.gov">Kate.Kurtz@seattle.gov</a>
Ron Jones	City of Olympia	<a href="mailto:Rjones@ci.olympia.wa.us">Rjones@ci.olympia.wa.us</a>
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Peter Godlewski	Association of WA Businesses	<a href="mailto:Peterg@awb.org">Peterg@awb.org</a>
Rod Whittaker	WRRRA	<a href="mailto:rod@wrra.org">rod@wrra.org</a>

## Appendix B. Community Agreements

1. Treat other workgroup members, facilitation team, and Ecology staff with respect
2. Allow one person to speak at a time and listen actively to others
3. Come to workgroup meetings with an open mind
4. Assume best intent
5. Intend no malice with what you say, assume no malice in what you hear
6. Represent your interests and those of your constituents; bring forward constructive comments, don't disagree just to disagree
7. Be present and engaged throughout the meeting
8. Come prepared to use meeting time productively
9. **When possible, provide data and information to support statements**
10. **If you find yourself in a speaking role throughout a meeting, move back into a listening role to make space for others. If you find yourself mostly in a listening role, move into a speaking role.**

# Memorandum

To: Compostable Products Advisory Committee  
From: Cascadia Consulting Group, Inc.  
Date: November 29, 2023  
Subj: Compostable Products Management Literature Review

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## Purpose & Methodology

The goal of this literature review is to establish what we know about the current state of managing compostable materials in Washington by drawing upon existing studies and research, as well as review current laws and work products from other advisory committees in Washington and other jurisdictions. The purpose of reviewing this information is to help the Advisory Committee determine strengths, weaknesses, opportunities, and barriers with the existing system as well as gaps in existing information. The research topics that frame this literature review are:

- Organic materials management facilities and infrastructure related to managing compostable products in Washington state and across the U.S.
- Consumer confusion caused by compostable and noncompostable products and resulting contamination issues. This includes outreach and education programs and the role of education to prevent contamination.
- Types of compostable products and standards related to the breakdown of products in industrial facilities and home composting, such as composting methods, third-party certifications, and American Society for Testing and Materials (ASTM) standards.

- Downstream impacts of compost, such as existing research on Greenhouse gas emissions and toxic chemical contamination of PFAS in finished compost.
- Current laws related to compostable products in Washington state and other jurisdictions.
- Work products from contemporaneous stakeholder advisory committees.

## Discussion Questions for Consideration

- What does this research tell us about what is working to achieve *“the state’s goal of managing organic materials, including food waste, in an environmentally sustainable way that increases food waste diversion and ensure that finished compost is clean and marketable?”*
- What does it tell us about what is not working to achieve the state’s goal?
- Where do we see opportunities and barriers to improve compostable products management in Washington state?
- In what areas do we still need more information to move this committee’s work forward?
- Are there findings that do not align with your experience? If so, what is the difference?

## Methodology

Cascadia’s research team identified and researched existing studies and other relevant information, then requested input on additional topics and sources from the Washington Department of Ecology (“Ecology”) and the Advisory Committee. From there, the research team catalogued findings from the literature and summarized the results using this research memo.

## Background

Managing food waste is a huge challenge and critical to managing organic materials overall in a more sustainable way. According to Ecology, more than one million tons of food waste is generated annually in the state, of which 35% is sent to the landfill. This wasted material has significant environmental, social, and economic impacts.

In 2022, Washington passed the Organics Management Law, which set aggressive goals for the state, including reducing organics waste disposal by 75% by 2030. Directives such as this from both the state and local levels aimed at reducing the amount of material disposed in the landfill have shifted the focus of many municipalities to expand existing yard debris collection programs to include food waste as well as compostable paper and packaging to help drive participation and increase the amount of food diverted from landfill. Along with this change, a new set of challenges have emerged with the rise of compostable products.

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## Findings

### Key Findings Across Research Topics

#### Compost infrastructure

- The types of composting methods used by facilities, the materials facilities accept as feedstock, and what jurisdictions include in their composting programs is not universal and varies across the state.
- The amount and types of organic materials processed annually is growing as jurisdictions expand food scrap collection programs to allow compostable paper and packaging to achieve ambitious diversion goals. This presents challenges for industrial compost facilities, as operating and upgrading facilities to meet these demands and manage contamination is costly in terms of time and resources.

## Consumer confusion

- The main drivers of consumer confusion surrounding compostable products are conflicting and unclear product labeling and inconsistencies in organics programs across and within jurisdictions.
- The most prevalent contaminants in compost streams are plastics (most notably plastic film, garbage bags, and rigid plastics), glass, noncompostable paper, and treated wood. These contaminants have varying levels of impact on facilities. While some are more common (such as film plastics), others present greater challenges and risk (such as glass).
- Preventing contamination through education and enforcement before collection takes place is more effective than contamination removal during the composting process.

## Compostable standards

- Under the Plastic Product Degradability Law (RCW 70A.455), Washington state has established a set of standards for the types of compostable products that can be sold and distributed in the state, which include third-party certifications that verify products meet ASTM standards. Whether these certified-compostable products fully compost in real life applications in the field is contested.

## Current laws and other advisory committee work products

- Washington is joining a handful of states introducing legislation to work towards improving management of organic materials and increasing food donation, composting, and anaerobic digestion. Four other states (Colorado, Minnesota, California, and Maryland) have mandated third-party certification for compostable products sold or distributed in their state and prohibited misleading labeling terminology. Like Washington, Colorado and California also have additional color and labeling requirements to distinguish certified compostable products.
- Contemporaneous stakeholder advisory committees have produced work products and recommendations on similar organic materials management topics to this advisory group, and most notably address consumer confusion, labeling guidelines, and education. These groups include the Washington State Organics Contamination



Reduction Work Group, the US Composting Council + Biodegradable Packaging Institute Compostable Labeling Task Force, and the Closed Loop Partners Composting Consortium. The details of these workgroup outcomes are discussed further in this report section: Work products from contemporaneous stakeholder advisory committees.

- It will be important to keep an eye out for information released in 2024 by the newly formed CalRecycle Plastic Pollution Prevention and Packaging Product Responsibility Act Advisory Board as well as Colorado’s Department of Public Health and Environment study on the feasibility of mandating organic materials diversion from landfills as directed by SB23-191. This report is set to be published by August 1, 2024.

## Findings by Research Topic

### Compostable products and standards related to breakdown of materials

#### KEY FINDINGS

Findings	Notes
<p>The American Society for Testing and Materials (ASTM) has established standards related to compostability, and guiding framework for products seeking compostability certifications. The various frameworks detailed by ASTM play a crucial role in ensuring that products claiming compostability adhere to rigorous criteria.</p>	<ul style="list-style-type: none"> <li>• ASTM D6400: This standard pertains to compostability of products made out of plastic and bioplastics. It outlines the criteria that such products must meet to be considered compostable.</li> <li>• ASTM D6868: This standard specifically addresses the compostability of plastic films or coatings attached to compostable products.</li> <li>• ASTM D8410: This standard addresses the evaluation of cellulosic-fiber-based packaging material and products for compostability in municipal or industrial aerobic composting facilities (BPI, 2023).</li> <li>• ASTM D5338: While not directly related to compostability, ASTM D5338 is a testing method used to determine the aerobic biodegradation of plastic materials under</li> </ul>

Findings	Notes
	<p>controlled composting conditions, including thermophilic temperatures.</p>
<p>Biodegradable Products Institute (BPI) is a leading third-party certifier on compostable products and packaging in North America.</p>	<ul style="list-style-type: none"> <li>• BPI certification requires products to first meet applicable ASTM standards (ASTM D6400 and ASTM D6868 and/or ASTM D8610) then the BPI standards (BPI, 2023).</li> <li>• BPI conducts lab testing for the breakdown of compostable products, and looks at the following testing requirements:               <ul style="list-style-type: none"> <li>○ Biodegradation: 90% absolute biodegradation or 90% relative to a suitable positive reference substrate, within 6 months.</li> <li>○ Disintegration of the final product: Quantitative disintegration of the final product at its maximum thickness, grammage, basis weight, and/or density, according to methods accepted by ASTM standards.</li> <li>○ Compost Quality: Testing to ensure the product does not negatively impact the resulting compost quality, including testing for toxic chemicals and metals.</li> </ul> </li> <li>• BPI certifies for the following types of composting methods: windrow, aerated static piles, and GORE system (In-vessel) (BPI, 2023).</li> </ul>
<p>The Compost Manufacturing Alliance (CMA) is another third-party certifier, that builds off ASTM standards for compostability. CMA uses field testing for compostability requirements (Compost Manufacturing Alliance , 2022).</p>	<ul style="list-style-type: none"> <li>• CMA-certified items must meet ASTM requirements and pass a CMA field test to be considered CMA certified compostable.               <ul style="list-style-type: none"> <li>○ ASTM lab results must include: FTIR analysis, % ash, heavy metals analysis, spectral analysis, phytotoxicity, disintegration results, and biodegradation results.</li> </ul> </li> </ul>

Findings	Notes
	<ul style="list-style-type: none"> <li>• CMA then utilizes the following categories to classify compostable items:                             <ul style="list-style-type: none"> <li>○ CMA-I: certified for covered in-vessel industrial composting systems.</li> <li>○ CMA-W: certified for Windrow Industrial Composting Systems.</li> <li>○ CMA-H: CMA’s historical list, comprising items that were approved for CMA-I at Cedar Grove Composting, prior to CMA’s official establishment.</li> <li>○ CMA-S: approved as a composting substrate in industrial composting. Exclusively for a narrow set of qualifying items that provide carbon without excessive additives or treatments. Examples include: wood cutlery, clay coated food trays, and paper straws (Compost Manufacturing Alliance , 2022).</li> </ul> </li> <li>• CMA also accepts EN 13432 certified items for mono-layer products such as cutlery and PLA.</li> </ul>
<p>There are a variety of standards for industrial compostability outside the US, including government and third-party requirements/ certifications.</p>	<ul style="list-style-type: none"> <li>• EN 13432 tests items for industrial compostability certifications based off the following requirements (European Bioplastics, n.d.):                             <ul style="list-style-type: none"> <li>○ Biodegradation (chemical breakdown of polymer fibers) within 6 months.</li> <li>○ Disintegration (physical breakdown) within 12 weeks.</li> <li>○ Test of ecotoxicity (any negative effects on plants).</li> <li>○ Heavy metals content.</li> </ul> </li> <li>• TUV Austria is a European third-party certifier, offering the OK Compost Industrial certification which requires items to</li> </ul>

Findings	Notes
	<p>adhere to EN 13432 standards and certifies an item as industrially compostable ( TUV Austria, n.d.).</p> <ul style="list-style-type: none"> <li>• There are two other large third-party industrial compostability certifiers: Compostable CIC and DIN Certico (European Environment Agency, 2023).</li> </ul>
<p>There are no home composting standards in the US, but there are several available outside the US, both third-party certifications and a few government standards.</p>	<ul style="list-style-type: none"> <li>• TUV Austria has OK Compost Home, which outlines requirements for home compostability standards. The certification is not based off any European or international standards, but indicates an item can be broken down in lower heat/ backyard composting (TUV Austria, n.d.).</li> <li>• The NF T51-800 is a French standard for home compostability describing the procedures and requirements for plastic products to be considered suitable for home composting. Standard is based on EN 13432 and ISO 18606 and ISO 17088 which establish requirements for compostability in industrial settings. To account for differences in home composting and industrial, NF T51-800 requires testing be performed at lower temperatures and for longer durations (C-Label, n.d.).</li> <li>• AS 5810-2010 are the Australian standards for biodegradable plastics suitable for home composting. This set of standards is based off the EN 13432 standards for industrially compostable products and has the following requirements (Council of Standards, Australia, 2010).             <ul style="list-style-type: none"> <li>○ Characterization: determines the constituents of test materials, including element contents.</li> <li>○ Biodegradability: test samples must degrade by at least 90% in total or equal to the maximum degradation of a suitable reference substance.</li> </ul> </li> </ul>

Findings	Notes
	<ul style="list-style-type: none"> <li>○ Disintegration: sufficient disintegration of an item must occur within 180 days.</li> <li>○ Compost quality: item must not negatively impact resulting compost quality, this includes various ecotoxicological tests.</li> </ul>
<p>There are currently no established home compostability standards in the US, however, an article by Washington State University (WSU) outlines how individuals may begin an at-home composting system and best practices surrounding home compost (Cogger, Sullivan, &amp; Bary).</p>	<ul style="list-style-type: none"> <li>● An ideal composting mix is comprised of a balance between bulking agents (low moisture, high porosity, low nitrogen) such as wood chips and sawdust, Energy (green) materials (high moisture, low porosity, high nitrogen) such as food and yard waste, and balanced raw materials (low to medium moisture, medium porosity, low to medium nitrogen) such as deciduous leaves and horse manure.</li> <li>● Pile size is integral to home composting, as the size of the pile determines the amount of heat able to be created and stored, and hotter piles decay items quicker. A 1-cubic yard pile should be sufficient for home composting needs.</li> </ul>
<p>A field study on compostable food service packaging found that packaging does not have a negative impact on resulting feedstock and may perform as an adequate bulking agent compared to wood and other traditional feedstock used in compost production. These findings indicate that foodservice packaging may be considered as a viable feedstock and used as a bulking agent; however, the processing time for this study was extended by three weeks compared to the normal processing time (Compost Manufacturing Alliance, 2018).</p>	<ul style="list-style-type: none"> <li>● The study looked at the following substrates and their effect on feedstock results:             <ul style="list-style-type: none"> <li>○ Paper/paperboard (including PLA coated)</li> <li>○ Molded wood pulp</li> <li>○ Bagasse (sugarcane fiber)</li> <li>○ Wheat straw</li> <li>○ Polylactic Acid (PLA)</li> <li>○ Crystallized polylactic acid (cPLA)</li> <li>○ Polybutylene succinate (PBS) film</li> <li>○ Aliphatic co-polymers</li> </ul> </li> <li>● While ultimately the addition of compostable service ware did not negatively affect the resulting compost, both field tests had to extend composting times by 3 weeks to</li> </ul>

Findings	Notes
	ensure all compostable products were adequately broken down/ disintegrated.
<p>The Compost Manufacturers Alliance (CMA) has an extensive products list which outlines accepted compostable products for partnering compost facilities. There are roughly 400 types of compostable products accepted in the state of WA ( Compost Manufacturing Alliance, 2023).</p>	<ul style="list-style-type: none"><li>• Starting in 2007, Cedar Grove Composting began a compostables field testing program, which expanded into CMA in 2017 through partnerships with Cedar Grove Composting, A 1 Organics, WeCare Denali, St. Louis Composting, New Earh, and Olympic Organics.</li><li>• Of the four CMA partner facilities in Washington, three accept CMA-I products (two Cedar Grove Composting facilities and Barr-Tech), and one accepts CMA-H products (Olympic Organics). See page 27 for CMA-H and CMA-I definitions. There are roughly 400 types of compostable products accepted in the state of WA.</li><li>• Cedar Grove composting facilities require that all straws and cutlery be brown.</li><li>• There are many brands producing compostable packaging, but some to note include:<ul style="list-style-type: none"><li>○ Bambu</li><li>○ Better Earth</li><li>○ BioBag Americas</li><li>○ Eco-Products</li><li>○ Greenware</li><li>○ Inno-Pak/Stalk market</li><li>○ Lollicup USA, Inc.</li><li>○ Pactiv Evergreen (Earth Choice)</li><li>○ World Centric</li></ul></li></ul>

## SUMMARY OF FINDINGS

Composting is the natural process of decomposition by which organic substances are broken down into simpler organic matter. Key elements that must be controlled during the composting process include feedstock and nutrient balance, particle size, moisture content, oxygen flow, and temperature. There are four main composting methods:

- **Aerated (turned) windrow** (US EPA, 2023): Involves forming organic waste into long rows called windrows. Piles are periodically aerated by manually or mechanically turning. Large enough to generate enough heat and small enough to allow oxygen flow. Suitable for large volumes of diverse wastes like yard trimmings, grease, liquids, and animal byproducts.
- **Aerated static pile (ASP)** (US EPA, 2023): Produces compost quickly (3-6 months). Suitable for homogenous mixes of organic waste. Works well for larger generators of yard trimmings and compostable municipal solid waste. Involves a large pile with layers of bulking agents for aeration, and air delivery through pipes.
- **In-Vessel** (US EPA, 2023): Processes large amounts of waste efficiently and accommodates various organic waste types. Involves feeding materials into vessels with highly controlled environmental conditions (temperature, moisture, airflow). Produces compost in a few weeks, with additional time for microbial activity balance and cooling.
- **Turned Mass Beds** (Zero Waste Washington, 2021): Elongated piles of materials at a relatively low height. Involves turning the mass beds at specific frequencies for product homogeneity, and mechanical ventilation systems like in-floor aeration. Suitable for indoor outdoor operations.

To determine what compostable products are considered compostable or will breakdown in these systems, there are established standards both inside and outside of the U.S. that products must meet. Within the U.S. and North America more generally, the American Society for Testing Materials (ASTM) standards D6400 and D6868 are used. Most other countries follow the European standards for compostable products, known as EN 13432 (European Bioplastics, n.d.). Both ASTM and EN standards look at biodegradation, disintegration, ecotoxicity, and heavy metals, however exact items tested in each category and the specific requirements for each category vary slightly.

There are no current standards for home compostability in the U.S., however, these standards exist in other parts of the world. Home composting is conducted at lower temperatures and smaller scale and is therefore unable to process the same types of materials and products as industrial compost facilities. Because of this, certifications for home

compostability must alter testing mechanisms. Under the Plastic Product Degradability Law (RCW 70A.455) there is no allowance for being labeled as home compostable.

In North America, the leading third-party certifiers are BPI and CMA. Both third-party certifications utilize ASTM standards as the basis for their certifications, testing for heavy metals, biodegradation, disintegration, and compost quality, and then build upon them. BPI conducts lab-testing to determine the compostability of products, whereas CMA performs field-testing to determine compostability. BPI offers a blanket certification that does not delineate between different composting measures (windrow, in-vessel, etc.) however CMA does categorize items based upon the systems in which they are compostable. Both certifications require a statement that the product contains no added PFAS chemicals, however organic fluorine up to 100ppm is allowed.

In Washington state, the Plastic Product Degradability Law requires that products labeled as “compostable” must be certified compostable by a third-party as outlined above. With the certification requirement in mind, there are over 400 different types of products approved by the CMA as compostable ( Compost Manufacturing Alliance, 2023) and over 23,000 by BPI (Biodegradable Products Institute, 2023). As such, all of these products are available for sale and distribution in Washington.

While the Advisory Committee is determining a working definition of compostable products, to begin identifying the potential types of products available in Washington, there are three main categories or types of compostable products for consideration:

- Foodservice products (i.e., cups, cutlery, straws, plates, bowls, takeout containers, etc.)
- Food scrap collection bags and bin liners
- Coffee pods/capsules

Materials used in these compostable products include the following primary substrates and what items they are used in:

Primary Substrates	Items
<b>Paper/Paperboard (including PLA-coated)</b>	Uncoated paper plates, beverage cups (hot), food trays, portion cups, napkins
<b>Molded wood pulp</b>	School food trays, plates



Primary Substrates	Items
<b>Bagasse (sugarcane fiber)</b>	Clamshells, plates
<b>Wheat straw</b>	Clamshells
<b>Polylactic acid (PLA)</b>	Beverage cups (cold), portion cups
<b>Crystallized polylactic acid (cPLA)</b>	Cutlery
<b>Polybutylene succinate (PBS) film</b>	Bags
<b>Aliphatic co-polymers</b>	Bags

Source: 2018 CMA Feedstock Study

As of January 1<sup>st</sup>, 2024 in accordance with RCW 70A.455, product producers required to meet the labeling requirements must declare the products sold or distributed in Washington that meet these standards. These declarations will be submitted to the Department of Ecology. Once available, Cascadia will present the product registry to the Advisory Committee. The number of products sold or distributed in the state will be difficult to assess, and Cascadia will attempt to estimate quantities by requesting sales data from manufacturers and distributors if the committee feels this information is valuable and will request industry contacts from Advisory Committee members to assist with compiling the data.

When considering compostable products, specifically foodservice packaging, as feedstock, a field study completed in 2018 found that “adding significant levels of diverse foodservice packaging to feedstocks did not appear to change the quality of the finished product positively or negatively, and it appeared to perform as well as traditional feedstocks used in compost production except for requiring extended processing time with a modified moisture and heat profile (Compost Manufacturing Alliance, 2018).” These findings indicate that foodservice packaging may be considered as a viable feedstock and used as a bulking agent, however noting that extended processing times may be required. This is a critical issue for commercial compost facilities as compostable products may require longer processing times than what is used at their facility.

Even with the certifications and standards outlined above, some facilities (such as A1 Organics in Colorado and composters in Oregon) contest that not all certified compostable products actually compost or breakdown as fully or as quickly as certified to do so.

## Consumer confusion caused by noncompostable products

### KEY FINDINGS

Findings	Notes
<p>Consumer confusion surrounding the disposal of compostable products is amplified by unclear and inconsistent product labeling, which leaves consumers unable to distinguish products, and increasing contamination rates. <b>The terms “biodegradable” and “made from plants” caused the most confusion for consumers</b>, as many could not distinguish these terms from “compostable”.</p>	<ul style="list-style-type: none"> <li>• In Washington state, biodegradable, degradable, decomposable, oxo-degradable, or any similar form of those terms are banned on plastic products per <a href="#">RCW 70A.455.030</a>.</li> <li>• A Composting Consortium study conducted by Loop partners and BPI that surveyed 2,765 individuals found:             <ul style="list-style-type: none"> <li>○ 31-49% of respondents could not distinguish between items marked as “biodegradable” and “compostable”, leading them to dispose of “biodegradable” products incorrectly (Composting Consortium, BPI, 2022).</li> <li>○ The term “made from plants” also increased consumer confusion and led to between 31-50% of respondents misidentifying these items as compostable (Composting Consortium, BPI, 2022)</li> </ul> </li> <li>• An article from the European Environmental Protection Agency referenced a study in Germany in which 58% of respondents thought that all bioplastics marketed as biodegradable were compostable (European Environment Agency, 2023).</li> </ul>
<p>Many studies identify disposal practices as a point for confusion, namely due to <b>jurisdictional variation/ program inconsistency</b> and</p>	<ul style="list-style-type: none"> <li>• Jurisdictional variation such as lists of accepted organics and inconsistent cart colors leads to increased contamination rates. This confusion is amplified for those who live and work in differing regions (Washington State Organics Contamination Reduction Workgroup, 2017).</li> </ul>

Findings	Notes
<p>a general <b>lack of education</b> surrounding disposal practices.</p>	<ul style="list-style-type: none"> <li>• Many studies pointed to a lack of education surrounding the disposal of compostable items.                             <ul style="list-style-type: none"> <li>○ In one study, 28% of respondents noted that they would place compostable products in the recycle bin at the end of use, both contaminating the recycling stream and decreasing organics diversion (Composting Consortium, BPI, 2022).</li> <li>○ There’s also a gap in knowledge on the difference between at-home and industrially compostable items, with 33% of people saying they would dispose of an industrially compostable item in an at-home or backyard facility (Composting Consortium, BPI, 2022).                                     <ul style="list-style-type: none"> <li>▪ At home facilities, such as backyard compost, do not operate under the same conditions as industrial facilities (namely heat and size of operation), and therefore items will not properly breakdown</li> </ul> </li> </ul> </li> </ul>
<p>Most common contaminants and key items causing consumer confusion include glass, plastic, noncompostable paper, and wood.</p>	<ul style="list-style-type: none"> <li>• Multiple studies cited glass as a top contaminant in organics collection. Glass is also noted as a problematic contaminant, as it poses a health risk to compost manufacturers handling the finish product, and farmers have even noted the ability for glass to incorporate itself root vegetables when applied (BioCycle, 2015)</li> <li>• There are many types of plastics that contaminate compost streams, including: plastic films (including bags), rigid plastics, produce stickers, and more.                             <ul style="list-style-type: none"> <li>○ A study looking at organics collection contamination in WA state found that out of 103 carts observed, plastic/ plastic bags accounted for 32% of contamination for residential carts, and 30.8% for commercial carts (Washington State Organics Contamination Reduction Workgroup, 2017).</li> <li>○ Produce stickers are small, sturdy, and water resistant, allowing them to remain intact through the composting process and often making it through the final screening process (BioCycle, 2015).</li> </ul> </li> <li>• Painted and/or treated wood was noted as a key contaminant across multiple sources. While untreated wood is often compostable, painted and treated wood is not.</li> </ul>

Findings	Notes
	<ul style="list-style-type: none"> <li>○ WA organics study found that treated wood comprised 19.4% of all cart contamination (Washington State Organics Contamination Reduction Workgroup, 2017)</li> <li>○ King County Waste Characterization (2022) found that treated wood was a top 3 contaminant, comprising .4% (824 tons) of all waste surveyed (211,928 tons) (Cascadia Consulting Group, 2023).</li> </ul>
<p>In addressing contamination rates and consumer confusion, studies identified the following opportunities: <b>better labeling guidelines and requirements, increased education on disposal, and cohesive policies and regulations on compostable products.</b></p>	<ul style="list-style-type: none"> <li>● In addressing labeling concerns, there are two main solutions: reconcile confusing terms and increase labeling requirements.               <ul style="list-style-type: none"> <li>○ Reconciling conflicting and confusing terms such as “biodegradable” and “made from plants” would decrease consumer confusion.                   <ul style="list-style-type: none"> <li>▪ The term “biodegradable” in marketing plastic is prohibited in many states because it leads to increased consumer confusion, including the State of Washington.</li> </ul> </li> <li>○ Individuals prefer compostable products that utilize a “winning” design” incorporating 2-3 design elements signifying an item as compostable (color choice, phrases, logos, etc.) (Composting Consortium, BPI, 2022).</li> </ul> </li> <li>● Dynamic educational programs targeted at specific generating sectors (residential, commercial, multifamily) are essential to reducing contamination rates. Each sector has its own issues surrounding compost contamination, therefore catering education materials to each group will best address those needs (BioCycle, 2015).</li> <li>● Jurisdictional inconsistency is a leading cause in consumer confusion, regarding the variety of accepted materials in different programs as well as diversity of cart colors. Working towards cart color consistency will reduce confusion and contamination (BioCycle, 2015).</li> </ul>

**SUMMARY OF FINDINGS**

Existing research shows that consumer confusion caused by noncompostable products is driven by: 1) conflicting and unclear product labeling, and 2) inconsistency in organics programs across and within jurisdictions, including differences in which items compost facilities accept and differences in cart colors for organics collection. The most prevalent

contaminants in compost streams include a variety of plastics (most notably plastic film, garbage bags, and rigid plastics), glass, noncompostable paper, and treated wood. Each of these contaminants present their own set of issues and challenges. Film plastics are the most common contaminant and is costly to remove and not always entirely effective. Glass is less common but equally as problematic as it is difficult to identify, remove, and a safety concern for customers using the finished compost (Washington State Organics Contamination Reduction Workgroup, 2017).

The most recent organics waste characterization studies completed in the City of Seattle and King County in 2022 report notably low contamination rates, at 2.1% in Seattle and 6% in King County. The most common contaminant material types in Seattle by weight were potentially compostable paper (0.6%), other non-recoverable waste, which includes non-recyclable glass, hazardous waste, and diapers (0.3%), and pet waste (0.2%) (Cascadia Consulting Group, 2023b). In King County, other miscellaneous and fines (4.3% or 9,143 tons), which includes dirt and soil, was the most prevalent contaminant, followed by other recyclable paper (0.4% or 878 tons) and dimensional lumber/engineered wood (0.4% or 824 tons). The contamination rate by subsector was 7% for the residential substream and 10% for nonresidential (Cascadia Consulting Group, 2023).

In January of 2024, results from the Department of Ecology 2022-2023 statewide recycling and organics characterization study will be available. This study will provide data on organics composition and contamination across facilities located in all four regions of the state (central, eastern, northwest, and southwest) throughout four seasons (summer, fall, winter, and spring). These results will be shared with the Advisory Committee.

Participant education and outreach are important tools to ensure organics disposal participant accountability and enforcement of organics disposal policies. The following strategies are recommended by the Washington State Organics Contamination Reduction Workgroup to address contamination (Washington State Organics Contamination Reduction Workgroup, 2017):

- **Terminology and labeling guidelines.** Address confusing terms in composting and call for stronger labeling guidelines for compostable products.
- **Tailored education for different sectors.** Advocate for sector-specific education (residential, commercial, multifamily) and emphasize that prevention through education and enforcement before collection is more effective than contamination removal during composting.

- **Understand contamination management challenges.** Highlight the necessity of contamination management, acknowledge the expenses involved for commercial composters, and recognize the need for effective and affordable methods and technologies.
- **Jurisdictional cooperation for cohesive policies.** Advocate for increased cooperation among jurisdictions and propose the implementation of consistent cart colors and accepted materials lists.
- **Shared accountability through contracts.** Stress the importance of contracts between municipalities, haulers, and composter as crucial tools for building shared accountability and minimizing contamination.
- **Effective cart tagging programs.** Recommend cart tagging programs for behavior change and emphasize the need for consistent, audience-focused education in these programs, ultimately minimizing contamination.

## Current laws related to compostable products in Washington

### KEY FINDINGS

#### Findings

Per [WAC 173-350-220 \(2003\)](#), local health departments issue solid waste permits for composting facilities and Ecology regulates permit exempt facilities. Composting facilities with over 25 cubic yards of materials on-site are required to notify and report to their regulating authorities, and comply with reporting, safety, and testing requirements. Organic waste management facilities are required to obtain permits when siting new or expanding facilities if meeting specific volume or operational characteristics.

In **2009**, the legislature passed [SB 5797](#) (codified as 70A.205.290 RCW) that exempts certain anaerobic digesters from solid waste permitting requirements. The exemptions are conditioned to facilities that process at least 50% livestock manure and no more than 30% waste-derived materials, among other conditions.

The [USDA Organic Compost and Vermicompost in Organic Crop Production](#) guidance (**2011**) provides clarification on allowed practices for composition, production, and use of compost and vermicompost in organic crop

## Findings

production. This guidance applies to National Organic Program (NOP) certifying agents, all certified and exempt organic producers, and input suppliers.

In **2012**, [SB 5343](#) (codified as 70A.15.2590) extended provisions related to emissions limits for sulfur dioxide from anaerobic digesters under certain circumstances.

In **2013**, the state updated regulatory language regarding the prioritization of organic feedstocks for composting operations. Revised rules in [WAC 173.350.220](#) address feedstock, materials management, odor issues, and conditions for exempt compost facilities to improve organics management

In **2015**, [HB 1060](#) (codified as 70A.200.140) encouraged composting by including it as part of the programs funded by the Waste Reduction, Recycling, and Litter Control Act. These programs are funded by a 0.00015% litter tax on retailer's gross proceeds of consumer products, including food, groceries, beverages and drinks, household paper products, among others.

In **2016**, the legislature passed [SB 6605](#) to prevent the spread of disease, plant pathogens, and pests derived from solid waste facilities operations, including composting.

[Seattle Municipal Code section 21.36.082 \(2017\)](#) requires that businesses do not put food scraps, compostable paper, yard waste, and recyclables in their garbage.

[Seattle Municipal Code section 21.36.083 \(2017\)](#) requires that residents do not put food scraps, compostable paper, yard waste, and recyclables in their garbage.

In **2018**, [HB 2580](#) established sales, use, and property tax exemptions for anaerobic digestion and landfill facilities generating biogas.

In **2019**, the legislature passed [HB 1114](#) (codified as 70A.205.715 RCW) to reduce food waste to minimize its environmental impacts and fight food insecurity. The law established a goal of reducing food waste sent to the landfill by 50% by 2030, compared to 2015 levels, and required the development of a state plan for reducing wasted food and improving food waste diversion. The plan will use the following strategies to reach targets:

- Strategy 1: Prevent and reduce the amount of edible food that is wasted by residents and businesses.

## Findings

- Strategy 2: Help match and support the capacity for edible food that would otherwise be wasted with food banks and other distributors that will ensure the food reaches those who need it.
- Strategy 3: Support productive uses of inedible food materials, including using it for animal feed, energy production through anaerobic digestion, or other commercial uses, and for off-site or on-site management systems including composting, vermicomposting, or other biological systems.

(Zero Waste Washington, 2021)

In **2019**, [HB 1569](#) (codified as 70A.455.050 RCW) addressed marketing language for compostable products. The law prohibits sales or distribution of products that claim biodegradability but do not meet the American Society of Testing and Materials (ASTM) standards as compostable products or packaging. The bill also requires compostable products to be identifiable through coloration, logos, and similar.

In **2020**, the legislature passed [HB 2713](#) (codified as 43.19A.120 RCW), which encourages local governments that provide residential compost collection to buy back at least 50% of the finished products generated by facilities processing their organic materials.

In **2020**, the legislature passed [SB 5323](#) (codified as 70A.530 RCW) banning thin single-use plastic carry home bags. Similarly in **2021**, the legislature passed [SB 5022](#) banning certain expanded polystyrene food ware, recreational coolers, and packing peanuts, requiring minimum post-consumer recycled content in beverage and other bottles and jugs and trash bags, and mandating that food establishments only provide utensils, straws, cold cup lids, and condiment packages upon customer request. These two laws aim to reduce plastic contamination in the organic waste stream.

**The 2022 Washington Plastic Product Degradability Law** ([RCW 70A.455](#)) claims standards for compostable products sold in the state. The law sets labeling requirements and declarations for compostable products. These requirements will reduce misleading, confusing, and deceptive labeling practices. This law applies to these compostable products sold in Washington:

- Film bags and film products
- Food packaging
- Food service products



## Findings

Further, the law states that environmental marketing claims for plastic products should adhere to uniform and recognized standards for "composability" and "biodegradability," since misleading, confusing, and deceptive labeling can negatively impact local composting programs and compost processors. It also authorizes the department of ecology, cities, and counties to pursue false or misleading environmental claims and "greenwashing" for plastic products claiming to be "compostable" or "biodegradable" when they are not (Zero Waste Washington, 2021).

In **2022**, Washington's Legislature passed [HB 1799](#) requiring diversion of organic materials away from landfill disposal and towards food rescue programs and organics management facilities. These actions will help Washington achieve its 2030 goal to cut landfill-disposed organic material by 75%, compared to 2015. By 2025, the amount of edible food wasted in landfill disposal must be reduced by 20%. Other organic materials will be processed at composting facilities, anaerobic digesters, and used for vermiculture and emerging technologies.

The **2023 Food Packaging Prohibition** ([RCW 70A.222.070](#)) states that certain types of food packaging that have per- and polyfluoroalkyl substances (PFAS) intentionally added to them may not be manufactured, sold, or distributed in Washington beginning in 2023.

## SUMMARY OF FINDINGS

Recent legislation addressing organic materials management in Washington has focused on reducing contamination, addressing food waste, and improving permitting and capacity of facilities. Most notably in 2022, the state passed HB 1799 to reduce organic waste disposal 75% by 2030 and widely expand collection. The law defines organic waste as manure, yard debris, food waste, food processing waste, wood waste, and garden waste, and works to change food waste collection and disposal statewide (Zero Waste Washington, 2021). Before this, the 2022 Washington Plastic Product Degradability Law set labeling requirements and declarations for compostable products to reduce misleading, confusing, and deceptive labeling practices. In addition, Washington's 2019 HB 1114 focuses on reducing food waste to minimize its environmental impacts and fight food insecurity statewide. With these and other recent legislative updates, Washington is joining a handful of states introducing legislation to work towards improving management of organic materials and increasing food donation, composting, and anaerobic digestion.

Four other states (Colorado, Minnesota, California, and Maryland) have also mandated third-party certification for compostable products sold or distributed in their state and prohibited misleading labeling terminology. Colorado and

California also have additional color and labeling requirements to distinguish certified compostable products like Washington state. In May 2023, Colorado also passed SB23-191, which jumpstarts composting infrastructure statewide by evaluating and creating a plan for organics diversion (Karidis, 2023). SB23-191 calls for the Colorado Department of Public Health and Environment to study the feasibility of mandating organic materials diversion from landfills and report its findings by August 1, 2024.

Further research is needed to assess the success, challenges, and barriers of these laws in other states and jurisdictions, as well as enforcement. Cascadia’s research team will interview solid waste planners, commercial composters, and other subject matter experts, as well as research policies implemented in the European Union and Canada to provide a comprehensive, international perspective.

## Work products from contemporaneous stakeholder advisory committees

### KEY FINDINGS

Findings	Notes
<p><b>U.S. Composting Council and Biodegradable Packaging Institute’s Compostable Labeling Task Force</b></p> <p>The goal of this Task Force is to ensure that compostable products make it to compost manufacturers, are easily identifiable, and break down in compost facilities. The Task Force developed a model bill meant to inspire legislation that will create uniformity across states, or national legislation to standardize labeling. This group was convened in response to the challenge of compost infrastructure and compostable product labeling varying greatly from state to state, and a need for consistent requirements for both producers and receivers of compostable products (The</p>	<p>Task Force members agreed on the following guiding principles for successful compostable labeling:</p> <ul style="list-style-type: none"> <li>• Limit composability claims to products that touch, contain or carry food products, scraps or other organic material accepted by compost manufacturers.</li> <li>• Prohibit misleading or unsubstantiated terms (“biodegradable,” “degradable”, “decomposable”).</li> <li>• Recommend field testing to ensure compatible facility conditions.</li> <li>• Require compostable products such as produce and food collection bags, and other foodservice ware to be labeled “compostable,” carry a certification mark, and distinguish themselves with specific coloring.</li> </ul>

Findings	Notes
<p>US Composting Council (USCC) and Biodegradable Products Institute (BPI) , 2023)</p>	<ul style="list-style-type: none"> <li>• Prohibit non-compostable food packaging and food service ware from using identical compostable colors, labeling, or marks.</li> <li>• Exempt compostable products from using resin ID codes to reduce consumer confusion.</li> </ul>
<p><b>Washington State Organics Contamination Reduction Workgroup Report and Toolkit</b></p> <p>The goal of this work group is to respond to the challenge of an increase in the types and amounts of physical contaminants mixed with incoming loads of organics. The increased volume and variability of contamination contributes to increased labor and equipment costs and, in some cases, makes the finished product more difficult to market. (Washington State Organics Contamination Reduction Workgroup, 2017)</p> <p>Specifically:</p> <ul style="list-style-type: none"> <li>• The Contractual Policies subcommittee was formed to research and recommend policy options and contractual best management practices to contribute toward the elimination of contaminants in the residential and commercial organics streams.</li> <li>• The Participant Education and Outreach subcommittee was formed to identify gaps in perceived versus actual contaminants and develop an Organics Educator Toolkit to aid in bridging those gaps.</li> </ul>	<p>To reduce contamination of organics in Washington, the work group developed the following key takeaways:</p> <ul style="list-style-type: none"> <li>• <b>Shared accountability.</b> All members of the composting industry must share accountability for maintaining compost quality by working together to reduce contamination. Contracts between municipalities, haulers, and composters are a crucial tool for building shared accountability and minimizing contamination.</li> <li>• <b>Jurisdictional inconsistencies contribute to confusion.</b> Variability within and between jurisdictions regarding cart design, accepted items, and audience creates participant confusion about what can and cannot be composted.</li> <li>• <b>Prevention should be the focus.</b> Contamination prevention through education and enforcement prior to collection is more effective than contamination removal during the composting process.</li> <li>• <b>Contamination management is important but costly.</b> Commercial composters need effective technologies to help them identify, remove, and dispose of contaminants. These methods are typically expensive and their effectiveness varies widely.</li> </ul>

Findings	Notes
<ul style="list-style-type: none"> <li>• The Upstream Systems subcommittee was formed to seek opportunities to connect the dots between known approaches while exploring new strategies across the entire product manufacturing supply chain, including but not limited to packaging design and related participant sorting behavior.</li> <li>• The Processing subcommittee was formed to identify and recommend contaminant removal best management practices at processing facilities.</li> </ul> <p>The work group believes Washington can lead organics contamination reduction efforts by:</p> <ul style="list-style-type: none"> <li>• Advocating for funding and resources, promoting regional collaboration, and building education, outreach, and assistance tools.</li> <li>• Building consensus around best management practices for packaging design and labeling.</li> <li>• Partnering with solid waste agencies, haulers, and composters.</li> <li>• Helping to develop implementation guidelines and best practices with solid waste jurisdictions.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>There are a wide range of contaminants.</b> The four most common contaminants in the organics stream are plastic film, plastic garbage bags, rigid plastics, and glass, and some contaminants (like glass), present more challenges than others.</li> <li>• <b>Growth of compostable packaging presents both opportunities and challenges.</b> Compostable foodservice packaging may lead to an increase in food scrap diversion but can also present challenges for composters, including: Difficulty in knowing the difference between compostable and non-compostable items that look alike; Non-compostable products that are mislabeled; Requirements that food distributors and vendors apply stickers to pre-packaged food containing nutrition and allergen information.</li> </ul>
<p><b>Closed Loop Partners Composting Consortium</b> (Composting Consortium, 2022)</p> <p>The Composting Consortium, managed by the Center for the Circular Economy at Closed Loop Partners, is a multi-year collaboration across the entire compostable</p>	<p>The demand for compostable packaging as an alternative to traditional plastics has surged, with a projected 17% annual growth between 2020 and 2027. However, despite its popularity, only 2% of composting facilities in the U.S. currently accept and process compostable packaging, revealing a significant gap between demand and the capacity</p>

Findings	Notes
<p>packaging value chain to pilot industry-wide solutions and build a roadmap for investment in technologies and infrastructure that enable the recovery of compostable food packaging and food scraps.</p> <p>The Consortium works to identify best practices for consumer understanding of compostable packaging labeling and collection; establishes when compostable versus reusable or recyclable packaging applications are most appropriate; collaborates on best practices to inform policy making; and aims to expand composting infrastructure to recover compostable packaging and food scraps.</p>	<p>to manage these materials effectively (Composting Consortium, 2022).</p> <p>To achieve a more resilient composting industry in the US, the Consortium outlined four steps:</p> <ul style="list-style-type: none"> <li>• <b>Economic incentives for composting facilities.</b> To address the increasing complexity and costs associated with diverse feedstocks, including food scraps and compostable packaging, there is a need to enhance economic incentives for composting facilities.</li> <li>• <b>Contamination management.</b> It is crucial for industry players, including product manufacturers and government agencies, to establish consistent communications and labels to mitigate physical and chemical contamination, particularly from non-compostable plastic packaging. Certification and packaging regulations defining labeling and food-contact requirements can play a key role in reducing confusion.</li> <li>• <b>Infrastructure transition and expansion.</b> Supporting the transition and expansion of composting infrastructure includes upgrading existing facilities to accept diverse feedstocks and developing new projects and facilities capable of processing a range of materials, such as certified compostable packaging and food scraps.</li> <li>• <b>Local, state, and federal legislation to incentivize organics diversion.</b> Recent developments highlight a</li> </ul>

Findings	Notes
	<p>shift in legislation addressing organics recycling, with California passing comprehensive laws such as SB-54 for plastic pollution prevention and Extended Producer Responsibility (EPR), along with SB-1383 mandating a 75% reduction in organic waste disposal by 2025. Colorado has also passed an EPR bill, along with other states, and major consumer goods brands have pledged to transition to recyclable, compostable, and reusable materials by 2030. Tools such as organics disposal bans, curbside and drop-off recycling services, and pay-as-you-throw schemes are crucial for improving the system. Policymakers must consider operational realities of composting facilities and provide economic incentives for necessary infrastructure upgrades.</p>
<p><b>Eco-Cycle</b> released the annual State of Recycling &amp; Composting in Colorado report (Eco-Cycle, 2023). The report aims to convey the following findings related to composting in Colorado:</p> <ul style="list-style-type: none"> <li>• Highlight the importance of composting to reduce climate pollution, reduce waste and strengthen local economies.</li> <li>• Make recommendations on needed composting infrastructure and policies at the state and local levels.</li> </ul> <p>Eco-Cycle summarized five key composting legislation and acceptance updates in Colorado:</p>	<p><b>SB23-253</b> (May 2023) - Sets strict labeling requirements on products sold as compostable and certain requirements around third-party certification (Karidis, 2023).</p> <ul style="list-style-type: none"> <li>• Producers can only represent products as compostable if they are certified as such by an independent, third-party verification body.</li> <li>• Products must comply with labeling standards that ensure they are easily distinguishable as certified compostable at point of sale, point of use, in public sorting areas, and processing facilities.</li> <li>• Makers of products that are not certified compostable cannot use tinting, colors, labeling, images, or words</li> </ul>

Findings	Notes
<ul style="list-style-type: none"> <li>• <b>SB23-253</b> (May 2023) - Sets strict labeling requirements on products sold as compostable and certain requirements around third-party certification (Karidis, 2023).</li> <li>• <b>SB23-191</b> (May 2023) - Jumpstarts composting infrastructure statewide by evaluating and creating a plan for organics diversion (Karidis, 2023).</li> <li>• <b>A1 Organics Material Acceptance Update</b> (March 2023) - A1 Organics, Colorado’s largest composter, changed its accepted materials list to only accept food scraps and yard and plant trimmings (Pyzyk, 2023).</li> <li>• <b>Producer Responsibility Policy HB22-1355</b> (2022) - An extended producer responsibility law for packaging passed in Colorado and included measures related to composting.</li> <li>• <b>Updates to Colorado solid waste regulations Section 14 pertaining to compost facilities</b> (2023) - addresses Colorado’s compost infrastructure, processing capacity, and hauling of materials (Eco-Cycle, 2023).</li> </ul>	<p>that are required for products with compost certification. Nor can they use similar visuals to imply the product will eventually break down.</p> <p><b>SB23-191</b> (May 2023) - jumpstart composting infrastructure statewide by evaluating and creating a plan for organics diversion (Karidis, 2023). The Colorado Department of Public Health and Environment must study the feasibility of mandating organic materials diversion from landfills and report its findings by August 1, 2024. The study must:</p> <ul style="list-style-type: none"> <li>• Identify needed organics diversion infrastructure and create an infrastructure development plan.</li> <li>• Recommend policies and regulations to enable diversion.</li> <li>• Identify opportunities for end-market development of organic materials.</li> </ul> <p><b>A1 Organics Material Acceptance Update</b> (March 2023) (Pyzyk, 2023) A1 Organics, Colorado’s largest composter, changed its accepted materials list to only accept food scraps and yard and plant trimmings. The goal is to reduce the amount of material they receive that is too contaminated to effectively process (currently at 10%).</p> <ul style="list-style-type: none"> <li>• Materials like paper towels, coffee filters, packaging or service ware will no longer be accepted — even if it is labeled “compostable.”</li> </ul> <p><b>Producer Responsibility Policy HB22-1355</b> (2022)</p>

Findings	Notes
	<p>An extended producer responsibility law for packaging passed in Colorado and included measures related to composting, including clarifying funding to support contamination reduction in composting and to support the processing of compostable packaging (Pyzyk, 2023). These changes include:</p> <ul style="list-style-type: none"> <li>• Clarified funding for composting to reduce contamination and support processing of compostable packaging.</li> <li>• Added definition of compostable.</li> <li>• Included capacity of composting facilities to process compostable packaging in needs assessment to inform funding.</li> </ul> <p><b>Updates to Colorado solid waste regulations Section 14 pertaining to compost facilities (2023)</b></p> <ul style="list-style-type: none"> <li>• The updates will be considered for formal adoption by the state’s Solid Hazardous Waste Commission in February 2024 (Eco-Cycle, 2023).</li> <li>• Responds to Colorado’s lack of compost infrastructure, lack of processing capacity, and reliance on long-distance hauling of materials.</li> </ul> <p>Updates regulations for permitting smaller and mid-sized compost infrastructure that will reduce costs to start-up businesses and smaller public facilities and enable expansion of compost infrastructure</p>



Findings	Notes
<p>California has implemented several legislative measures to transform its compost industry (Biodegradable Products Institute, 2023) :</p> <ul style="list-style-type: none"><li>• In 2016, the state set a goal to reduce organic waste landfill disposal by 75%, targeting short-term climate pollutants like methane from food waste.</li><li>• In 2018, a law mandated that disposable food packaging at state facilities must be recyclable or compostable. This includes bowls, cups, plates, containers, and trays, with CalRecycle maintaining a list of compliant materials.</li><li>• The 2021 passage of AB 1201 requires compostable products to be certified by third-party organizations, while also prohibiting misleading terms on plastic products. This aligns with similar measures in Washington and Maryland.</li><li>• In early 2022, after years of consideration, the state passed SB 54, a comprehensive bill establishing a statewide Extended Producer Responsibility (EPR) program. It includes specific targets for product and packaging reduction, recyclability, and compostability.</li><li>• Most recently, Governor Newsom signed a bill mandating that pre-checkout bags for produce and bulk items must be certified compostable, reusable, or made from recycled paper. Non-compostable alternatives are prohibited from being tinted green, brown, or beige."</li></ul>	

Findings	Notes
<p>The Minnesota Composting Council is the MN State Chapter of the United States Composting Council (Minnesota Composting Council, 2023).</p> <ul style="list-style-type: none"> <li>• The MNCC's Legislative Committee is very active and worked to pass the Compostable product labeling bill in the 2023 Legislative Session (HF 1315/SN 1321).</li> <li>• The MNCC has been working with composters, product manufacturers, local units of government and the Minnesota Pollution Control Agency (MPCA) to amend MN Stat. 325E.046 Standards for Labeling Plastics Bags to apply to food service products and other packaging claiming composability.</li> <li>• The goal of HF 1315/SF 1321 is to reduce contamination received at composting facilities and microplastics in soils.</li> <li>• Washington, Maryland and California have also adopted similar bills</li> <li>• The MNCC also developed a Compostable Products web page to make it easy for buyers, businesses, and residents to determine if a product is truly certified compostable and will be accepted by a compost facility in Minnesota.</li> </ul>	<p>Key components of the new bill include (Minnesota Composting Council, 2023):</p> <ul style="list-style-type: none"> <li>• Products can be labeled as 'compostable' if they:               <ol style="list-style-type: none"> <li>1. Are made solely of wood without coatings or additives.</li> <li>2. Are made solely of paper without coatings or additives, or</li> <li>3. Meet ASTM D6400 (bags/films) or ASTM D6868 (plastic or                   <ol style="list-style-type: none"> <li>1. plastic-lined items) standard.</li> <li>2. specifications for composting in an industrial compost facility</li> <li>3. By January 1, 2026, all products must be certified by a non-profit third party whose is capable</li> <li>4. of performing product analysis.</li> </ol> </li> </ol> </li> <li>• Products cannot be labeled 'biodegradable' until an industry adopted standard ASTM specification is developed and approved by the State Legislature.</li> <li>• Retailers must not knowingly sell misleading products. All retailers are given an additional year over manufacturers, distributors and wholesalers to come into compliance.</li> </ul> <p>Adoption of this bill will:</p> <ul style="list-style-type: none"> <li>• Reduce misleading product claims</li> <li>• Reduce resident, food establishment, etc. confusion on what products are accepted for composting</li> <li>• Reduce contamination at compost facilities resulting in them manufacturing a cleaner more sellable product</li> </ul>

## SUMMARY OF FINDINGS

Contemporaneous stakeholder advisory committees have produced work products and recommendations on similar organic materials management topics to this advisory group. These groups include but are not limited to the Washington State Organics Contamination Reduction Work Group, the US Composting Council + BPI Compostable Labeling Task Force, and the Closed Loop Partners Composting Consortium.

- **The Washington State Organics Contamination Reduction Work Group** responds to the challenge of an increase in the types and amounts of physical contaminants mixed with incoming loads of organics and developed key takeaways for meeting these challenges through regional collaboration and partnerships, consensus building around standards and best practices, and streamlining implementation guidance for jurisdictions (Washington State Organics Contamination Reduction Workgroup, 2017). Results from their 2017 report and toolkit are highlighted in the consumer confusion summary.
- **The U.S. Composting Council and Biodegradable Packaging Institute’s Compostable Labeling Task Force** developed a [model bill](#) to guide legislation that will create uniformity to standardize compostable labeling. This group was convened in response to the need for consistent requirements for both producers and receivers of compostable products (The US Composting Council (USCC) and Biodegradable Products Institute (BPI) , 2023).
- **The Closed Loop Partners Composting Consortium**, a group of national collaborators, studies best practices for consumer understanding of compostable packaging labeling and collection; collaborates on best practices to inform policy making; and aims to expand composting infrastructure to recover compostable packaging and food scraps. The Consortium provided recommendations on economic incentives for composting facilities, contamination management, infrastructure expansion, and legislation to incentivize organics diversion (Composting Consortium, 2022).

It is also important to note that in 2019, composters in Oregon signed a letter listing several reasons why they do not want “compostable” packaging and food service ware delivered to their facilities (Oregon Composters, 2019). These reasons include: 1) It does not always compost, 2) It introduces contamination, 3) It hurts re-sale quality, 4) The composters cannot sell to organic farmers, 5) It may impact human and environmental health, 6) It increases compost operators’ costs and makes our jobs harder, 7) Just because something can be composted does not mean that is necessarily better for the environment, 8) In some cases, the benefits of recycling surpass those of composting, and 9) Good intentions are not being realized. These signatories emphasized that Oregon needs to focus on recycling food

and yard trimmings into high-quality compost products, and that compostable packaging does not help them to achieve this goal.

CalRecycle has also recently convened the Plastic Pollution Prevention and Packaging Product Responsibility Act Advisory Board, which aims to identify barriers and solutions to creating a circular economy and to advise the department, producers, and producer responsibility organizations on implementation of this new Act (CalRecycle, 2023). The board consists of both voting and non-voting representatives of local government, environmental and environmental justice organizations, manufacturers, recycling and solid waste enterprises, and retail and grocery associations. Specifically, the board will include members from the composting industry in California and a producer of third-party certified compostable products. The advisory board has not yet produced work products for review.

## Downstream impacts of compost

### KEY FINDINGS

Findings	Notes
<p>Compostable packaging does not always result in better environmental outcomes when compared to non-compostable packaging that is either landfilled, incinerated, or recycled (Oregon DEQ, 2018).</p>	<ul style="list-style-type: none"> <li>A study by Oregon DEQ comparing the GWP of compostable packaging and non-compostable packaging found that on average, compostable packaging that is composted had a 46% higher negative environmental impact than products that were either landfilled, incinerated, or recycled. This is in large part due to the alternative benefits perceived through alternative means of disposal such as recycling.</li> </ul>
<p>The Department of Ecology is currently partnering with WSU to measure and study compost emission factors</p>	<ul style="list-style-type: none"> <li>During 2021-2023, research efforts between Ecology and WSU focused on improving understanding and</li> </ul>

which will ultimately be used in the design of a statewide study of emissions from commercial compost facilities in Washington (Karie Boone, 2023).

control of air emissions in state compost facilities, alongside advancements in solid waste-to-energy technologies. This research comes in response to the Climate Commitment Act and ongoing actions to address climate change and reduce greenhouse gas emissions.

- One of the specific research objectives of the partnership was to understand volatile organic compound (VOC) emission factors for Title V air emissions permitting for commercial compost facilities in WA. The study utilized a small-scale continuously aerated static pile (CASP) system at WSU Pullman for VOC measurements from green waste/food waste composting. The study also developed continuous VOC testing methods to determine emission rates for negatively aerated piles.
- The study concluded that modern CASP systems may exhibit significantly lower VOC emission rates compared to those determined in a California study 15 years ago for windrow composting. These results will ultimately be used in the design of a statewide study of emissions from commercial compost facilities in Washington (Karie Boone, 2023).

All certifications for compostable products require toxicity screenings, and many call out PFAS chemicals directly (Department of Ecology, 2021).

- BPI and CMA certified compostable products require that items contain 100 ppm or less of PFAS chemicals, and that any resulting fluorine is naturally found and not added in.
- While not a direct requirement, compostable items were used in the Department of Ecology’s AA study

	<p>and were found to be an adequate replacement to PFAS containing service ware.</p>
<p>Preliminary data shows that levels of PFAS chemicals in commercial organic residual products, including biosolids and non-biosolids compost, may be elevated when compostable serviceware is included in the feedstock (BioCycle, 2018).</p>	<ul style="list-style-type: none"> <li>• Concentrations of 17 PFAS compounds in food scraps compost, including compostable serviceware, ranged from 30-75 ppb, whereas composts made from just yard and leaf waste showed concentrations totaling up to 5 ppb (BioCycle, 2018).</li> <li>• A study by the U.S. EPA also found that food waste streams are a source of PFAS containing materials, with kitchen waste compost resulting in higher levels of PFAS compared to yard waste compost (U.S. EPA, 2021).</li> <li>• It's important to note that due to growing concern over PFAS contamination in composting streams, BPI initiated a strict policy that limits total fluorine content of 110 mg/kg (parts per million) for all compostable serviceware products. This requirement went into effect in 2019.</li> </ul>

## SUMMARY OF FINDINGS

### Greenhouse gas emissions

In 2017, the Oregon Department of Environmental Quality (DEQ) conducted a life-cycle analysis (LCA) of compostable packaging and other foodservice ware that evaluated raw materials used, manufacturing processes, transportation systems, and what happens to the waste. The results showed that in most comparisons, the production and use of compostable materials (and composting them) resulted in higher environmental impacts than that of either non-compostable materials, or compostable materials treated via recycling, landfilling, or incineration (Oregon DEQ, 2017). In response to this report, BPI members with expertise in LCA methodology found that the study did not account for how

compostable products are linked to value compost and the composting process which is essential for understanding the true environmental footprint of compostable materials. Flaws in the methodologies, such as outdated or misleading inputs were also noted (BPI, 2021).

The Department of Ecology is currently partnering with WSU to measure and study compost emission factors in response to the Climate Commitment Act and ongoing actions to address climate change and reduce greenhouse gas emissions. During 2021-2023, research efforts focused on improving understanding and control of air emissions in state compost facilities, alongside advancements in solid waste-to-energy technologies. One of the specific research objectives the partnership undertook was to understand volatile organic compound (VOC) emission factors for commercial compost facilities in Washington which will ultimately be used in the design of a statewide study of emissions from commercial compost facilities in Washington (Karie Boone, 2023).

#### Toxic chemical contamination

Per and polyfluoroalkyl substances (PFAS) chemicals have traditionally been used in foodservice ware and packaging as they provide oil and grease resistance, water repellency, and leak resistance (Department of Ecology, 2021). It is likely that finished compost from commercial compost facilities that accept food scraps and/or compostable foodservice packaging contain PFAS, however data is limited, and more research is needed. Preliminary data presented by Purdue University in 2018 showed levels of PFAS in a wide variety of commercial organic residual products, including biosolids and nonbiosolids compost. “It is important to note that the measurements were of the <2 millimeters (mm) fraction removed from materials with moisture contents of 5 to 55 percent (relatively dry materials), creating a high bias in the values in comparison to the actual materials. The combined total concentrations of 17 PFAS compounds ranged from about 35 to 200 ppb in biosolids-based products (including composts). In comparison, concentrations in food scraps composts (which included compostable serviceware as a feedstock) ranged from 30 to 75 ppb. Composts made from just yard and leaf waste showed concentrations of the same 17 PFAS totaling up to ~5 ppb” (BioCycle, 2018).

Similarly, the EPA released a paper in August of 2021 noting that the agency must “better understand the contribution of food waste streams to persistent chemical contamination in compost and digestate, the potential risks to human health and the environment posed by land applying compost and digestate made from food waste, and the most effective strategies to prevent or mitigate the risks and communicate these findings to affected stakeholders” (U.S. EPA, 2021). The paper also noted that while data on PFAS in food waste is limited, referenced several studies that revealed the presence of PFAS in food waste and compost, that PFAS concentrations were higher in kitchen waste compost than green (yard) waste compost, PFAS concentrations were higher in composts with compostable food packaging, and compostable food contact materials have higher PFAS concentrations than non-compostable samples (U.S. EPA, 2021).

It is also challenging to test for PFAS in compost as the EPA-approved laboratory procedures used are intended for drinking water. While the ASTM does have a standard (D7968-17a), commercial labs have developed their own modified method for testing and results vary from one lab to another and may not be comparable (BioCycle, 2020).

The good news is that over the past 15 years PFAS have been largely phased out of use in the U.S. and Canada, and concentrations should start diminishing. Washington State Department of Health (DOH) and Department of Ecology (ECY) established the Alternatives Assessment (AA) in accordance with legislation RCW 70A.222.070 which restricts the manufacture, distribution, and sale in WA of “food packaging in which PFAS chemicals have been additionally added in any amount”. The AA will evaluate less toxic chemicals and non-chemical alternatives for food packaging that comes in direct contact with food. While compostable products and compostability were not a direct concern in the AA, some of the alternative products tested were compostable. Certified compostable products, as certified by BPI or CMA, contain 100 ppm or less of PFAS chemicals (Department of Ecology, 2021).

## Current infrastructure related to compostable products management

### KEY FINDINGS

Findings	Notes
<p>A quarter of the 56 compost facilities reporting composting feedstock data to the Department of Ecology accept both yard debris and food scraps. Yard debris is the most common feedstock, as it is being collected in 28 of 30 counties with composting facilities (Zero Waste Washington, 2021). These composting facilities processed a total of 1.27 million tons of feedstock in 2022. Most of this weight came from yard debris and food scraps (~910,000 tons) (Ecology, 2022).</p>	<ul style="list-style-type: none"> <li>• Manure and agricultural organic material are accepted at facilities located in counties with significant agricultural activity in Puget Sound and central and eastern Washington. In addition, counties with high levels of forestry industry process wood waste.</li> <li>• A total of 10 counties accept more than five types of feedstock in their facilities: Snohomish, King, Whatcom, Pierce, Yakima, Klickitat, Lincoln, Thurston, Walla Walla, and Whitman (Zero Waste Washington, 2021).</li> </ul>



Findings	Notes
<p>There are 56 composting facilities in Washington state, which include exempt and permitted composting facilities, and biosolids management facilities (Ecology, 2022; Ecology, 2022).</p>	<ul style="list-style-type: none"> <li>• A compost facility may be exempt from permitting if it meets the conditions listed in Table 220-A and (a) through (e) of legislation WAC 173-350-220 (WA State Legislature, 2018).               <ul style="list-style-type: none"> <li>○ Facilities accepting all organic feedstocks and operating at a volume no more than 5,000 gallons or 25 cubic yards of material on-site at any time, may be granted permit exemption with no additional testing/reporting.</li> <li>○ Facilities accepting all organic feedstocks and operating at a volume greater than 25 but no more than 250 cubic yards of material on-site at any one time, not to exceed 1,000 cubic yards in a calendar year must provide notice 30 days prior to operation.</li> </ul> </li> <li>• A compost facility accepting all organic feedstocks and is larger than 250 cubic yards of material on-site at one time/ 1,000 cubic yards of material in a calendar year must attain a permit. Permitting requirements are detailed in sections (3)-(11) of WAC 173-350-220 (WA State Legislature, 2018).</li> <li>• Of these 56 composting facilities, 38% are in the Northwest region, 30% in the southwest region, 16% in the eastern region, and 16% in the central region (Ecology, 2022)</li> </ul>
<p>More research is needed to confirm what composting facilities accept compostable products and how many use a pick line to remove inbound compostable products.</p>	<ul style="list-style-type: none"> <li>• The information will be requested in organic materials management interviews completed by the Cascadia research team in January and February 2024.</li> </ul>
<p>In the US, nearly 50% of food waste facilities are located in California (35), New York (14), Colorado (13), Pennsylvania (10), Washington</p>	<ul style="list-style-type: none"> <li>• In the US, smaller-scale, independent operations are important players in establishing organic waste processing across the country, with the West Coast leading in number of full-scale facilities (BioCycle, 2023).</li> </ul>

Findings	Notes
<p>(9), Texas (9) and North Carolina (9) (BioCycle, 2023).</p>	<ul style="list-style-type: none"> <li>• Of the 200 US facilities surveyed by BioCycle, 151 are commercially owned, 43 are owned by a municipality, four are run by nonprofits and two are employee-owned (BioCycle, 2023). More than half self-finance, over a quarter receive bank loans, and just under a quarter are financed through state or federal grants (BioCycle, 2023).</li> </ul>
<p>2022 waste characterization data from the City of Seattle and King County reveal that yard debris comprises a majority of the organics stream. Detailed statewide organics characterization data will be available in January 2024 and will provide more insights into the composition of inbound organics by specific material types and region.</p>	<ul style="list-style-type: none"> <li>• 2022 waste characterization data for the City of Seattle reveals that 69.1% of the organics stream is yard waste, 20.3% is food waste, 8.6% is other accepted compostable material, and the remaining 2.1% is contamination (Cascadia Consulting Group, 2023b).</li> <li>• Similarly, 2022 King County organics composition data shows that 69% of the organics stream is yard waste, 10% is food waste, 6% is contaminants, 3% is compostable paper, and 0.3% is compostable plastic (Cascadia Consulting Group, 2023).</li> </ul>
<p>In the US, the majority of composting facilities reporting are permitted to accept yard waste and food waste, similar to WA.</p> <p>Of all 200 facilities reporting in 2023, 142 (71%) accept compostable food-contact packaging and 58 (29%) do not (BioCycle, 2023).</p>	<ul style="list-style-type: none"> <li>• In the food waste category, over 90% of facilities in the US accept pre-consumer vegetative food waste (e.g., from supermarkets, restaurants); close to 80% accept commercial and institutional source separated pre and postconsumer food waste (BioCycle, 2023).</li> <li>• The largest generators of organic waste are commercial landscapers and tree trimmers, followed by commercial food waste generators.</li> </ul>

Findings	Notes
<p>In WA, the most common composting methods are aerated static pile and turned windrow. Aerated static pile is most common in western WA, while turned windrow method is most common in central and eastern WA. This difference is most likely due to the larger volumes of compost material needing to be processed in western WA (see Figure 2) (Zero Waste Washington, 2021).</p>	<ul style="list-style-type: none"> <li>In the US, the majority of the 200 facilities surveyed use the windrow composting method (75), 46 use aerated static piles (ASP), and 11 use both windrow and ASP (BioCycle, 2023).</li> </ul>
<p>During 2016-2018, post-consumer food scraps feedstocks increased across WA, with Lincoln and Walla Walla counties increasing the most (Zero Waste Washington, 2021).</p>	<ul style="list-style-type: none"> <li>Snohomish and King counties recorded the highest increase of mixed composting streams that included yard debris and food scraps (70.1 and 65.5 thousand tons, respectively) (Zero Waste Washington, 2021).</li> <li>In WA, feedstock is generally processed locally (within the County where it was produced), but significant inter-county material transport occurs in the Puget Sound and inter-state transport between Oregon and Idaho.</li> </ul>
<p>WA has a total of 43 anaerobic digesters producing biogas from organic materials, which can be used to process various types of organic waste, including manure, food scraps, sewage sludge and industrial organic residues (Zero Waste Washington, 2021).</p> <p>WA also uses vermiculture and black soldier fly, land application, and incineration and energy recovery methods to process organic waste.</p>	<ul style="list-style-type: none"> <li>Most of these facilities (33) are related to wastewater treatment facilities and nine are farm-based, which aligns with national distribution (only 255 out of 1500 anaerobic digestion facilities in the US are farm-based).</li> <li>There are five units in the Monroe Correctional Complex which use vermiculture and black soldier fly methods, processing nearly 15 tons of food waste a month (Zero Waste Washington, 2021).</li> <li>There are 15 land application sites holding a solid waste permit in WA.</li> </ul>

Findings	Notes
	<ul style="list-style-type: none"> <li>Energy recovery facilities processed between 334 and 876 thousand tons of organic materials per year during the period of 2006 to 2017.</li> </ul>
<p>A study completed by Zero Waste Washington in 2021 found that the barriers to expanding organic materials management facilities in WA include:</p> <ul style="list-style-type: none"> <li>Logistical challenges (cost of transportation, physical space needs for siting or expanding facilities, unclear zoning)</li> <li>Financial burden and risks from relying on government incentives and competition with landfills.</li> <li>Regulatory challenges, and variability in application of state regulations, reflecting overburdened staff and lack of needed data.</li> <li>Operational issues, including seasonal variation of feedstock types and quantities, nutrient loads of certain organic materials like food waste to composting operations (low-quality products and nuisance odors), and high maintenance costs (anaerobic digesters).</li> <li>Physical contamination from municipal sources and chemical contamination from herbicides.</li> <li>Moderate to weak demand for end products results from highly competitive</li> </ul>	<p>WA state organic materials management barriers align with those reported nationally:</p> <ul style="list-style-type: none"> <li>Operational: In the US, 26 facilities noted that improvements or upgrades to their systems were needed – through an improved composting pad and/or working surface. 51/127 facilities have no plans to expand, 48 plan to expand their existing site, and 28 said they will be opening additional food waste composting facilities.</li> <li>Retrofits: Most composting operations in the U.S. accept yard trimmings only, processing leaves, grass clippings, and woody debris. Many of these sites may be candidates to upgrade to process food waste. Retrofitting existing yard trimmings-only facilities is one path forward to close the infrastructure gap for food waste and food-contact compostable packaging in the U.S (BioCycle, 2023).</li> <li>Permitting: The permitting process to transition to also accepting food waste can be costly and challenging, creating a meaningful barrier to scaling food waste composting in the U.S. Similar to yard trimmings composting, the permitting requirements vary by state, in some cases quite dramatically. Retrofitting existing facilities may be challenging because of the cost to upgrades, ease of permitting process, time needed to upgrade, and state food waste disposal bans (BioCycle, 2023).</li> <li>Contamination: Contamination thresholds vary across facilities; some have zero tolerance (45 out of 145 facilities);</li> </ul>

Findings	Notes
<p>prices of standardized chemical soil amendments and fertilizers.</p> <ul style="list-style-type: none"> <li>• Under current regulations by the U.S. Department of Agriculture regulations for the National Organic Program, compostable products cannot be accepted as feedstock for certified organic compost.</li> <li>• Knowledge gaps and local governments hampered by limited budgets and staff to regulate the industry (Zero Waste Washington, 2021).</li> </ul>	<p>some report less than 5% (66); less than 10% (15); less than 15% (2); and other reported no set threshold (17) (BioCycle, 2023).</p>

### SUMMARY OF FINDINGS

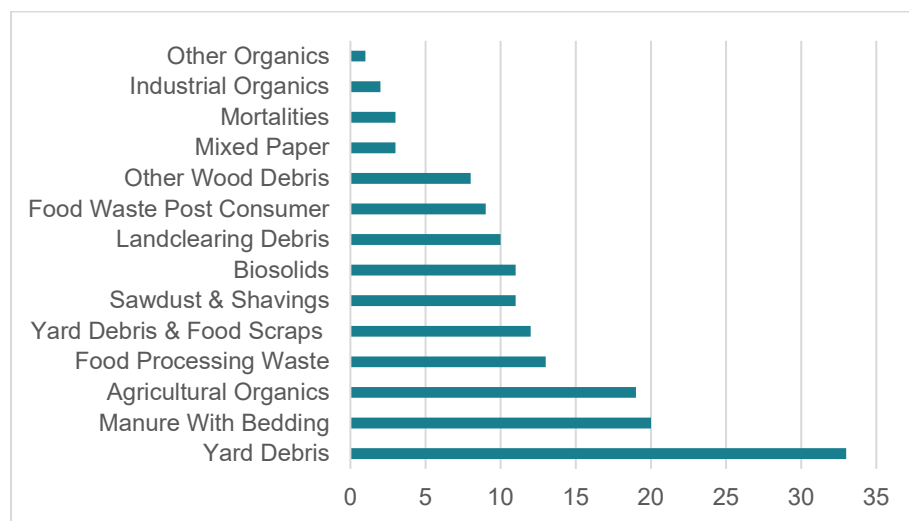
To understand how compostable products are currently managed in Washington state, it is helpful to know what organic materials management facilities are operating across the state and related infrastructure information, such as accepted feedstocks and the amount and types of material processed. In 2022, there were 56 permitted and permit-exempt industrial organic materials management facilities in Washington. Of those facilities, the majority were in the western half of the state, with 21 facilities located in the northwest region and 17 facilities in the southwest. These facilities account for 72% of processed organic material across the state, with nearly half (49%) processed by facilities in the northwest region alone (see Table 1).

**Table 1: Washington organic materials management facilities (number & percentage of total facilities) and materials processed annually (tons & percentage of total tons)**

Region	Number of facilities	Annual feedstock total tons
Central	9 (16%)	170,512 (13%)
Eastern	9 (16%)	180,851 (14%)
Northwest	21 (38%)	626,322 (49%)
Southwest	17 (30%)	291,443 (23%)
<b>Total</b>	<b>56</b>	<b>1,269,127</b>

In terms of accepted feedstocks, 21% of facilities reported that they accept yard debris and food scraps, 16% reported that they accept post-consumer food waste, and 5% reported that they accept mixed paper (Figure 1 for detailed breakdown).

**Figure 1: Number of facilities accepting feedstock types**



By weight, yard debris and food scraps represent nearly half (41%) of all processed material at 525,075 tons annually. This information is provided by Ecology’s annual report data from organic materials management facilities, and yard debris and food scraps tonnages are reported together. Post-consumer food waste represents less than 5% of all material processed annually at 53,367 tons and mixed paper at 22,367 tons. Appendix A provides the Department of Ecology’s annual report data for organic materials management facilities in the state from 2022.

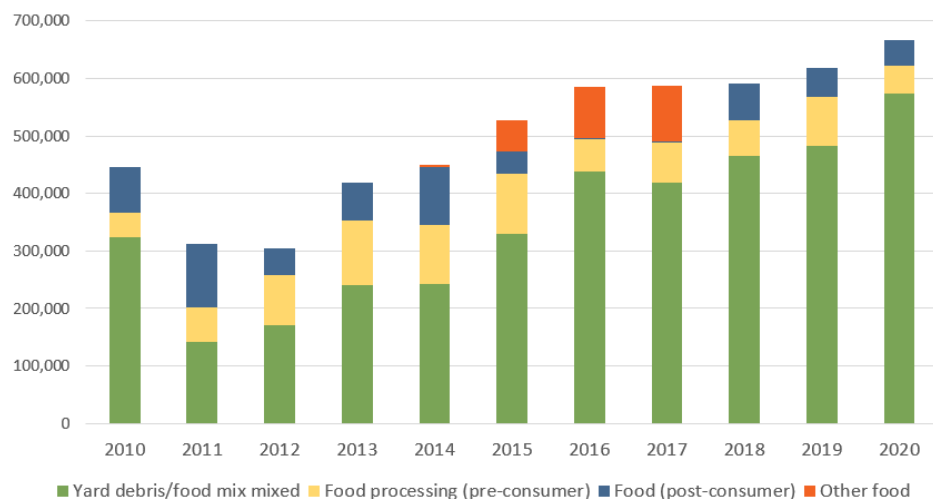
Detailed statewide organics characterization data will be available in January 2024 and will provide more insights into the composition of inbound organics by specific material types and region.

2022 waste characterization data for the City of Seattle reveals that 69.1% of the organics stream is yard waste, 20.3% is food waste, 8.6% is other accepted compostable material, and the remaining 2.1% is contamination (Cascadia Consulting Group, 2023b). Similarly, 2022 King County organics composition data shows that 69% of the organics stream is yard waste, 10% is food waste, 6% is contaminants, 3% is compostable paper, and 0.3% is compostable plastic (Cascadia Consulting Group, 2023).

The amount of food composted in Washington has steadily increased over the past decade, with tons increasing by over 200,000 annually. This increase is directly driven by mixed yard debris and food waste (which does not include post-

consumer food waste only). This trend continued in 2022 with mixed yard debris and yard debris and food scraps representing 71% of all processed material at 909,781 tons annually (Ecology, 2022).

**Figure 2: Food composted in Washington state (tons), by type**



**Food processing (pre-consumer):** From 2010 through 2016 the amounts shown were Food Processing + pre-consumer veg categories. In 2017 "pre-consumer" was moved to "Other Food" category. Then in 2018 began calling this "Food Process (pre-consumer)."

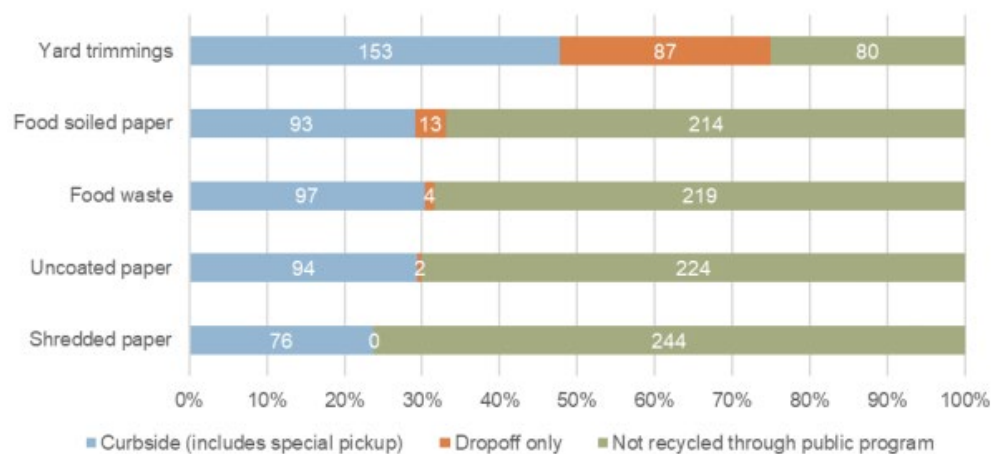
**Other Food:** Some compost facilities may have used this category for their food that had compostable packaging.

Source: Washington State Department of Ecology

The type of local organics collection programs available varies across the state. In 2019, 75% of jurisdictions had access to yard trimmings collection through either curbside collection or drop-off, while between 23% and 33% of jurisdictions had access to expanded organics collection including food soiled paper, food waste and food soiled paper. Please refer to Figure 3 for details (Zero Waste Washington, 2021).



**Figure 3: Availability of organics collection by jurisdiction (count & percentage of jurisdictions)**



Source: Zero Waste Washington

The most common composting methods in the state are actively aerated static piles and turned windrow. Aerated static piles is the most common system in Western Washington and turned windrow is most common in the Central and Eastern regions (Zero Waste Washington, 2021). Eleven out of Washington’s 39 counties do not have a commercial organics facility (Ecology, 2022).

Noted barriers for expanding organic materials management facilities in Washington include logistical challenges, such as cost to transport materials, lack of space for expanding facilities, or unclear zoning; competition with landfills and financial burden; regulatory barriers and overburdened staff; operational issues like variation in feedstock quantity and type; physical contamination; and weak demand for end product (Zero Waste Washington, 2021). Similarly, these challenges echo those reported at composting facilities nationally, who note difficulties operating and upgrading facilities due to the cost and time to upgrade, lack of ease of permitting process, high contamination levels, and state food waste disposal bans (BioCycle, 2023).

At the national level, a reported 2% of composting facilities in the U.S. accept and process compostable packaging (Composting Consortium, BPI, 2022). Of facilities that accept food waste, 71% (142 out of 200) report that they also take compostable food-contact packaging. In terms of the types of compostable products accepted, the majority take soiled

paper and pizza boxes (83%) followed by certified compostable bag liners (66%) and compostable food-contact bioplastics packaging, such as foodservice ware (62%). Acceptance of these products is a growing trend, which is up 13% from five years ago.

What is currently missing from the literature is information on the status of acceptance of compostable products and the development of pick lines for removing compostable products at commercial compost facilities in Washington state. The research team will be conducting facility interviews to gather this information to present to the Advisory Committee.

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## Appendix A: 2022 Department of Ecology Annual Commercial Compost Facility Data

County	Region	Facility name	Agricultural Organics	Biosolids	Food Processing Waste	Food Waste Post Consumer	Industrial Organics	Landclearing Debris	Manure With Bedding	Mortalities	Sawdust And Shavings	Mixed Paper	Other Wood Debris	Yard Debris Food Scraps	Yard Debris	Other Organics	Facility Feedstock Total (tons)
Benton	Central Regional Office	City of Richland Horn Rapids Composting Operation**		x											x		4,422.00
Chelan	Central Regional Office	Stemilt World Famous Compost Facility			x				x						x		22,435.00
Chelan	Central Regional Office	Winton Compost Facility			x	x		x					x	x	x		4,523.00
Kittitas	Central Regional Office	Kittitas County Compost Facility													x		2,545.14
Klickitat	Central Regional Office	Dirt Hugger LLC			x	x		x					x	x	x		52,329.50
Okanogan	Central Regional Office	Brown to Green Composting												x			17.00
Yakima	Central Regional Office	Colonial Lawn & Garden, Inc.													x		291.20
Yakima	Central Regional Office	Natural Selection Farms Composting Facility	x		x		x				x				x		47,949.28
Yakima	Central Regional Office	Sunnyside Dairy	x						x		x						36,000.00
All State	Eastern Regional Office	PCA Compost Facility					x		x				x				38,841.00
Grant	Eastern Regional Office	Ovenell Farms Composting Facility			x				x				x				22,719.90
Grant	Eastern Regional Office	Quincy Compost													x		166.40
Lincoln	Eastern Regional Office	Barr-Tech Composting Facility**	x	x	x	x					x	x	x	x			99,742.00
Spokane	Eastern Regional Office	CHENEY WWTP*		x											x		2,781.87
Stevens	Eastern Regional Office	Smokey Ridge Meats			x				x								316.85
Walla Walla	Eastern Regional Office	Envirocom Compost Facility	x						x								794.50
Walla Walla	Eastern Regional Office	Sudbury Landfill Compost Facility	x						x						x		6,150.19
Whitman	Eastern Regional Office	WSU Compost Facility	x		x				x	x			x				9,338.00
Island	Northwest Regional Office	LANGLEY WWTP*									x				x		454.40
Island	Northwest Regional Office	Mailliard's Landing Nursery													x		4,250.00
King	Northwest Regional Office	Cedar Grove Composting Co. Maple Valley	x			x								x	x		194,427.00
King	Northwest Regional Office	Seattle University Onsite Composting			x										x		14.10
King	Northwest Regional Office	University of Washington Seattle Campus Compost Facility			x										x		37.99
King	Northwest Regional Office	Woodland Park Zoo							x								800.00
Kitsap	Northwest Regional Office	Olympic Organics LLC			x				x					x	x		18,230.35
San Juan	Northwest Regional Office	Midnight's Farm	x						x	x					x		458.16
Skagit	Northwest Regional Office	Dykstra Farm	x						x						x		562.39
Skagit	Northwest Regional Office	LA CONNER WWTP*		x					x				x		x		20,286.20
Skagit	Northwest Regional Office	Skagit Soils Inc	x											x			22,495.00
Snohomish	Northwest Regional Office	Bailand Farms Yardwaste (Bailey) Compost	x											x			13,000.00
Snohomish	Northwest Regional Office	Cedar Grove Composting, Inc.	x			x						x		x			96,763.00
Snohomish	Northwest Regional Office	GRANITE FALLS WWTP*	x	x							x						3,132.00
Snohomish	Northwest Regional Office	Lenz Enterprises Inc							x					x			134,631.00
Snohomish	Northwest Regional Office	Pacific Topsoils - Maltby						x							x		66,581.00
Snohomish	Northwest Regional Office	Riverside Topsoil Inc						x	x		x				x		3,403.32
Snohomish	Northwest Regional Office	Thomas Farm Agricultural Composting	x								x						15,222.00
Whatcom	Northwest Regional Office	Green Earth Technology (Compost)	x		x	x		x	x			x	x	x	x		27,062.70
Whatcom	Northwest Regional Office	LYNDEN WWTP*									x				x	x	1,318.50
Whatcom	Northwest Regional Office	Smit's Compost							x								3,192.75
Clallam	Southwest Regional Office	City of Port Angeles Compost Facility**	x	x													612.00
Clallam	Southwest Regional Office	Lazy J Tree Farm													x		3,000.00
Clark	Southwest Regional Office	H & H Wood Recyclers													x		312.00
Cowlitz	Southwest Regional Office	Cowlitz Valley Compost													x		19,542.84
Grays Harbor	Southwest Regional Office	Stafford Creek Corrections Center				x											15.98
Jefferson	Southwest Regional Office	Port Townsend Biosolids Compost Facility**		x											x		4,693.95
Jefferson	Southwest Regional Office	WA DOC OLYMPIC WWTP*		x		x		x									168.28
Lewis	Southwest Regional Office	Centralia Composting	x														17.03
Lewis	Southwest Regional Office	CENTRALIA WWTP*		x							x				x		11,970.00
Mason	Southwest Regional Office	North Mason Fiber Co						x		x					x		19,636.74
Pacific	Southwest Regional Office	LONG BEACH WWTP*									x						2,000.00
Pierce	Southwest Regional Office	Green Pet, LLC									x						110.08
Pierce	Southwest Regional Office	LRI Compost Factory						x	x						x		121,996.00
Pierce	Southwest Regional Office	Pierce County (Purdy) Composting Facility						x	x						x		41,211.00
Thurston	Southwest Regional Office	Cedar Creek Corrections Center WWTP**		x		x											49.88
Thurston	Southwest Regional Office	Dancing Goats and Singing Chickens Organic Farm	x					x	x						x		734.81
Thurston	Southwest Regional Office	Silver Springs Organics Composting LLC	x		x									x	x		65,372.00
<b>Feedstock totals (tons)</b>			24,759.33	10,955.19	62,727.86	53,367.62	19,814.60	39,275.64	92,919.01	852.74	22,089.74	22,367.16	9,795.83	525,075.64	384,704.92	422.00	<b>1,269,127.28</b>

Note: The facilities above reported composting the materials indicated on this chart to the WA Department of Ecology. They are permitted under WAC 173-350-220 or WAC 173-308\* (or both\*\*), or they are exempt but still required to report.