Oregon Department of Environmental Quality

Working Evaluation of Materials

ORS 459A.913(3)

DRAFT – Updated April 21, 2022

Introduction

Section 22(3) of the Oregon Recycling Modernization Act (ORS 459A.914) requires the Environmental Quality Commission to consider multiple criteria when identifying materials that are suitable for recycling collection, and the methods for collection of those materials. Criteria are not weighted or treated as pass/fail criteria, but rather are considerations that can help guide a thorough consideration and examination of issues. This document provides a consistent platform for DEQ to seek feedback from members of a Technical Workgroup on specific materials and the criteria in Section 22(3). The document will evolve over time as DEQ completes internal preliminary evaluation, seeks feedback on batches of materials over the course of several Technical Workgroup meetings, and revises evaluation based on feedback from the Technical Workgroup and other information, including information provided in response to the agency's Request for Information.

Changes to text that was contained in the version of this document dated March 14 are shown using "Track Changes" format. New additions of materials to the evaluation matrix are noted with double asterisks (**) before the name of the material and formatted in *italics*.

Evaluation Rubric

Evaluation Criteria

Evaluation criteria are defined and interpreted as follows:

- Relating to responsible end markets:
    - "Stability" and "maturity" may consider both historic and anticipated near-term future considerations, and address both presence of the responsible end market (availability to use materials) and stability of prices. Further, a market with a single or limited number of buyers would be considered "less stable".
    - "Accessibility" is largely a measure of location and distance (and by extension, cost)
    - "Viability" is a summation of prior sub-criteria and any other relevant considerations.
- "Anticipated yield loss" may consider all stages of the recycling process (collection, processing/sorting, and end markets). It is evaluated from the perspective of materials that are properly separated and placed into the recycling system; "yield loss" does not account for materials that are lost to recycling because they are not separated and placed into the recycling system by the material user (waste generator). Yield loss is limited to loss of the targeted material (properly prepared) along with any original packaging that is adhered or attached to it, such as labels. It does not include "loss" of non-target material that accompanies the material, whether due to failure to properly prepare materials (e.g., ketchup in a ketchup bottle), or the addition of contaminants either by the user (e.g., limes in a beer bottle) or during the recycling process (e.g., rainwater in bales of paper stored outside).
- "Compatibility with existing recycling infrastructure" – statutory criteria is split here into two sub-criteria: compatibility with *commingled* collection and processing, and compatibility with *separate* (non-

commingled) material collection and processing. Note that drop-off collection can be either commingled or separated.

- "Amount of material available" considers the quantity of material *generated* as projected for the year 2025 by Cascadia Consulting Group in prior work (2019 – click on "Growth Rates" tab) prepared for the Oregon Recycling Steering Committee. It considers both the quantity of materials available as individual materials, as well as in potential combination with each other. In some cases, the amount of material is not evaluated because the information is not available at the granular level of certain materials as defined in individual rows; in some of these cases, materials are likely to be aggregated together with similar materials (e.g., polypropylene bottles and polypropylene tubs are likely to managed in the same way by a processing facility).
- "Practicalities of sorting material" relates primarily to the ease of separating the material from other materials if collected in a commingled collection system.
- "Practicalities of storing material" may consider the practicality of storing the material unbaled (e.g., volume requirements relative to weight/value), the ability of the material to be baled or otherwise densified, and the practicality of storing baled material (including how quickly the bales might move and whether they are subject to potential degradation during storage, such as due to moisture)
- "Contamination" includes two considerations. The first is the potential of a material to bring contamination with it (e.g., OCC often brings tape and/or staples; food containers may bring food into the system; the acceptance of some plastics may lead generators to include other plastics; etc.). The second consideration is the nature of the contamination, the potential for "look-alike" contamination, its ability to be removed in a commingled processing facility, and potential impacts downstream. For example, food that is included with aluminum foil is not practical for a MRF to remove.
- "Ability for waste generators to easily identify and properly prepare the material" relates to both identification and proper preparation of materials.
- "Economic factors" will be evaluated quantitatively at the level of whole scenarios (vs. individual materials), and will consider both transactional costs (such as fuel, labor, and capital) as well as externalized costs (such as economic damages resulting from pollution). Not all materials will be evaluated for economic factors (for example, if they score poorly against multiple other criteria are not considered viable for recycling).
- "Environmental health and safety" is primarily a qualitative measure that considers safety and health impacts for workers, and whether the end market(s) is (are) likely to properly manage contaminants.
- "Environmental factors from a life cycle perspective" will be evaluated primarily based on quantitative data (where available) concerning life cycle impacts such as greenhouse gas emissions, depletion of nonrenewable resources, air and water toxics, etc. Most of this evaluation will occur at the level of whole scenarios as opposed to individual materials, in parallel with the evaluation of "economic factors". Not all materials will be evaluated for environmental factors (for example, if they score poorly against multiple other criteria are not considered viable for recycling).
- "Policy in ORS 459.015(2)(a) and (b)": These criteria are not directly germane to recycling, and (a) will be considered as part of the quantitative evaluation of "environmental factors from a life cycle perspective" (described above).
- "Policy in ORS 459.015(2)(c)": For purposes of this evaluation, this relates to the ability of the material to be recycled via responsible end markets that result in the greatest reduction of net negative impacts on human well-being and environmental health, responsible end markets that displace the production of more impactful materials, and processes that best preserve the value and molecular structure of the

material being recycled. Where value and molecular structure is preserved (e.g., mechanical recycling), materials are given a "5" if displacing high impact materials (e.g., aluminum) or a "4" if displacing lower-impact materials (e.g., corrugated cardboard). Where value and molecular structure is not preserved (e.g., pyrolysis) materials are given a "3" if displacing higher-impact materials (e.g., styrene resin, diesel fuel) or a "2" if displacing lower-impact materials.

Ratings

Most materials are evaluated against criteria using a summary score using a range of 1 – 5, as follows:

1 = Material is rated against the stated criteria as generally negative from the perspective of an effective recycling system

2 = Material is rated negatively against the stated criteria, but concerns are not as strong as a "1" and/or are counterbalanced by some positive considerations

3 = Material is rated neutrally against the stated criteria, potentially due to the presence of both positive and negative considerations

4 = Material is rated positively against the stated criteria, but positive features are not as strong as a "5" and/or are counterbalanced by some negative considerations

5 = Material is rated against the stated criteria as generally positive from the perspective of an effective recycling system

"ES" = May be eEvaluated separately (as described above)

"NE" = Not evaluated

"SV" = Significant variability (for example, may depend on end market)

DEQ is not proposing to weight criteria or otherwise add scores together. Rather, these criteria and ratings are used for the purpose of summary communication, especially to highlight potential concerns. Further, the act of evaluating materials against criteria helps to ensure that materials are subject to a robust evaluation, and that the intent of ORS 459A.914 is met – that is, that DEQ and the Environmental Quality Commission consider the evaluation criteria defined in statute.

Materials in italics and noted with double asterisks (**) are newly added to this matrix (were not included in prior published versions). Changes to text contained in prior versions (March 14) are shown using "Track Changes".

Criteria → Material:	Stability and maturity of responsible end markets	Accessibility of responsible end markets	Viability of responsible end markets	Anticipated yield loss during recycling	Compatibility with existing recycling infrastructure: commingled collection and processing	Compatibility with existing recycling infrastructure: separated material collection	Amount of material available	Practicalities of sorting	Practicalities of storing	Contamination	Ability for waste generators to easily identify and properly prepare material	Economic factors	Environmental health and safety considerations	Environmental factors from a life cycle perspective	Policy in ORS 459.015 (2) (a)-(b)	Policy in ORS 459.015 (2)(c)	Other
Paper packaging (uncoated and coated)																	
Old corrugated containers (OCC) – uncoated, ex. pizza boxes	5	5	5	4	5	5	5	5	~~5~~4	4	4	ES	5	ES	ES	4	
Pizza boxes	5	5	5	4	5	5		5	4	3	4	ES	5	ES	ES	4	
***Old corrugated containers (OCC) – wax coated, not recycle compatible (as paper)*	*3*	*2*	*2*	*NE*	*1*	*2*	*4*	*1*	*3*	*1*	*3*	*NE*	*4*	*NE*	*NE*	*NE*	
***Old corrugated containers (OCC) – other coated, recycle compatible*	*5*	*5*	*5*	*4*	*5*	*5*	*5*	*5*	*4*	*4*	*4*	*ES*	*5*	*ES*	*ES*	*4*	
***Single-wall kraft packaging (e.g., grocery bags)*	*5*	*5*	*5*	*4*	*5*	*5*	*5*	*5*	*4*	*5*	*5*	*ES*	*5*	*ES*	*ES*	*4*	
***Other multi-layer kraft packaging (e.g., paper padded mailers)*	*5*	*5*	*5*	*3*	*5*	*5*		*5*	*4*	*5*	*5*	*ES*	*5*	*ES*	*ES*	*4*	
***Non-poly coated paperboard packaging (e.g., cereal, cracker, cosmetic, medicine boxes)*	*4*	*4*	*5*	*4*	*5*	*5*	*5*	*5*	*4*	*4*	*4*	*ES*	*3*	*ES*	*ES*	*4*	
***Molded pulp packaging (e.g., egg cartons, other protective packaging)*	*5*	*5*	*5*	*?*	*5*	*5*	*5*	*5*	*4*	*4*	*5*	*ES*	*3*	*ES*	*ES*	*4*	
***Molded pulp food serviceware (e.g., take-out "clamshells")*	*1*	*2*	*1*	*?*	*3*	*4*	*NE*	*5*	*3*	*1*	*2*	*NE*	*3*	*NE*	*NE*	*4*	
***Gable-top and aseptic cartons (in mixed paper bale)*	*4*	*3*	*4*	*2*	*4*	*5*	*3*	*4*	*4*	*4*	*4*	*ES*	*3*	*ES*	*ES*	*4*	
***Gable-top and aseptic cartons (in Grade 52 bale)*	*3*	*2*	*3*	*SV*	*3*	*5*	*3*	*2*	*3*	*4*	*4*	*ES*	*3*	*ES*	*ES*	*4*	
***Paper cups, coated and uncoated (in mixed paper bale)*	*4*	*3*	*4*	*3*	*4*	*5*	*3*	*3*	*4*	*3*	*4*	*ES*	*3*	*ES*	*ES*	*4*	
***Paper cups, coated and uncoated (in Grade 52 bale)*	*3*	*2*	*3*	*SV*	*3*	*5*	*3*	*2*	*3*	*3*	*4*	*ES*	*3*	*ES*	*ES*	*4*	
***Other polycoated packaging (e.g., freezer containers, butter boxes, poly-lined deli wrap, animal feed bags) (in mixed paper bale)*	*Consistent with gable top cartons and aseptics? – to discuss 4/28*																

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***Other polycoated packaging (e.g., freezer containers, butter boxes, poly-lined deli wrap, animal feed bags) (in Grade 52 bale)*	*Consistent with gable top cartons and aseptics? – to discuss 4/28*																
***Other polycoated food serviceware (e.g., take-out boxes, food boats, paper plates) (in mixed paper bale)*	*1*	*2*	*1*	*NE*	*2*	*3*	*NE*	*2*	*2*	*1*	*3*	*NE*	*3*	*NE*	*NE*	*4*	
***Other polycoated food serviceware (e.g., take-out boxes, food boats, paper plates) (in Grade 52 bale)*	*1*	*2*	*1*	*NE*	*2*	*3*	*NE*	*1*	*2*	*1*	*3*	*NE*	*3*	*NE*	*NE*	*4*	
***Tissue paper*	*5*	*5*	*5*	*2*	*5*	*5*	*NE*	*4*	*4*	*4*	*5*	*ES*	*3*	*ES*	*ES*	*4*	
***Non-metalized gift wrap*	*5*	*5*	*5*	*3*	*5*	*5*	*NE*	*4*	*4*	*2*	*2*	*ES*	*3*	*ES*	*ES*	*4*	
~~Additional materials forthcoming~~																	
Printing and writing paper, paper products (non-packaging)																	
High-grade office paper (uncoated)	*5*	*5*	*5*	*4*	*5*	*5*	*4*	*5*	*4*	*5*	*5*	*ES*	~~*5*~~*4*	*ES*	*ES*	*4*	
Newspaper, newsprint	*5*	*5*	*5*	*4*	*5*	*5*	*5*	*5*	*4*	*5*	*5*	*ES*	~~*5*~~*4*	*ES*	*ES*	*4*	
***Magazines and other coated paper (e.g., catalogs)*	*4*	*4*	*5*	*3*	*5*	*5*	*5*	*5*	*4*	*4*	*5*	*ES*	*3*	*ES*	*ES*	*4*	
***Telephone directories*	*4*	*4*	*5*	*3*	*4*	*5*	*5*	*4*	*4*	*5*	*5*	*ES*	*3*	*ES*	*ES*	*4*	
***"Low grade" printing and writing paper (e.g., bulk mail, envelopes)*	*4*	*4*	*5*	*3*	*5*	*5*	*5*	*5*	*4*	*4*	*5*	*ES*	*3*	*ES*	*ES*	*4*	
***Shredded paper*	*5*	*5*	*5*	*SV*	*2*	*5*	*?*	*2*	*4*	*3*	*5*	*ES*	*3*	*ES*	*ES*	*4*	
***Hardcover books (collected commingled)*	*4*	*4*	*5*	*2*	*2*	*N/A*	*2*	*1*	*4*	*1*	*1*	*1*	*3*	*NE*	*NE*	*4*	
***Paperback books*	*4*	*4*	*5*	*3*	*5*	*5*	*NE*	*5*	*4*	*4*	*5*	*ES*	*3*	*ES*	*ES*	*4*	
~~Additional materials forthcoming~~																	
Plastic packaging and products																	
Clear PET bottles ≥ 6 ounces	5	5	5	3	5	5	5	~~4~~	~~5~~4	4	4	ES	~~5~~4	ES	ES	5	
***Clear PET thermoform packaging, not food serviceware (e.g., produce boxes, egg cartons)*	*3*	*3*	*4*	*2*	*3*	*5*	*4*	*3*	*4*	*3*	*3*	*ES*	*4*	*ES*	*ES*	*5*	
Natural HDPE bottles ≥ 6 ounces	5	5	5	3	5	5	4	~~4~~	~~5~~4	4	4	ES	~~5~~4	ES	ES	5	
Colored HDPE bottles ≥ 6 ounces	4	5	4	3	5	5	4	4	~~5~~4	4	4	ES	3	ES	ES	5	
***PP bottles ≥ 6 ounces*	*5*	*4*	*5*	*3*	*4*	*5*	*NE*	*4*	*4*	*5*	*4*	*ES*	*3*	*ES*	*ES*	*5*	
***PP tubs and other containers ≥ 6 ounces*	*5*	*4*	*5*	*3*	*4*	*5*	*NE*	*4*	*4*	*4*	*4*	*ES*	*3*	*ES*	*ES*	*5*	

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***HDPE colored nursery containers (e.g., pots, trays, etc.)*	*3*	*4*	*3*	*?*	*3*	*5*	*?*	*3*	*4*	*4*	*4*	*ES*	*3*	*ES*	*ES*	*5*	
***LDPE colored nursery containers (e.g., pots, trays, etc.)*	*3*	*2*	*3*	*?*	*3*	*5*	*?*	*3*	*4*	*4*	*4*	*ES*	*3*	*ES*	*ES*	*5*	
***PP colored nursery containers (e.g., pots, trays, etc.)*	*3*	*4*	*3*	*?*	*3*	*5*	*?*	*3*	*4*	*4*	*4*	*ES*	*3*	*ES*	*ES*	*5*	
***PS colored nursery containers (e.g., pots, trays, etc.)*	*2*	*2*	*2*	*?*	*2*	*5*	*?*	*2*	*4*	*4*	*4*	*ES*	*2*	*ES*	*ES*	*5*	
Additional materials forthcoming																	
Metal - packaging and other																	
Aluminum beverage cans	5	4	5	5	5	5	4	5	5	4	5	ES	4	ES	ES	5	
Steel (tin) and bi-metal cans	5	5	5	5	5	5	5	5	5	4	5	ES	4	ES	ES	4	
Scrap metal (smaller than 30 inches and less than 30 pounds)	4	4	4	4	2	4	5	2	5	3	2	ES	2	ES	ES	5	
Scrap metal (larger than 30 inches or more than 30 pounds)	4	4	4	4	1	4		2	5	3	2	ES	2	ES	ES	5	
Small metal pieces (e.g., lids, screws and nails). Such items to be collected inside a metal can, which has been crimped tightly closed.	4	4	4	4	2	4		2	5	3	2	ES	2	ES	ES	5	
Additional materials forthcoming																	
Other materials																	
Motor oil	4	4	4	SV	1	5	5	1	2	2	4	3	2	3	2	2	5
***Metalized paper "cans"*	*Depends on pathway – discuss 4/28*					*4*	*2*	*3*	*4*	*4*	*4*	*ES*	*3*	*ES*	*ES*	*4*	
Additional materials forthcoming																	

Alternate formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.oregon.gov