

Appendix F: Contamination Reduction and Outreach Plan

Introduction

RCW 70.205.045 requires that each county and city comprehensive solid waste management plan includes a contamination reduction and outreach plan (CROP) that addresses reducing the contamination of materials accepted as part of the recycling program.

RCW 70.205.045 requires that the CROP includes:

- Identifying key contaminants and their financial and other impacts on the collection system
- A list of actions for reducing contamination
- A schedule and details on how outreach will be conducted

These requirements follow from China's 2018 closure of what was the largest market for recyclable materials from the U.S. due to a high contamination rate.

This CROP is made part of the SWMP as **Appendix F: Recycling Contamination Reduction and Outreach Plan**. It is a working document and will be revised over time as necessary to keep it current. SWAC will assist staff in incorporating the CROP into the SWMP as part of the revisions scheduled for 2022.

Background

The Jefferson County Solid Waste Advisory Committee (SWAC) is a broad stakeholder group that includes representation from: citizens; the solid waste and recycling industry; the agricultural sector (Jefferson County Conservation District); the City of Port Townsend, and; Jefferson County Board of County Commissioners. Department of Ecology staff regularly attend SWAC meetings. Public Works engaged the SWAC in analyzing the County's recycling program at ten (10) regular meetings and one (1) special meeting convened exclusively for the purpose of this work. A SWAC subcommittee was formed to review and make improvements to a final draft.

Additionally, an action group of the Jefferson County-based non-profit Local 20/20 called Beyond Waste assisted Public Works staff with the refinement of its analysis of the performance of the material types collected as part of the recycling program.

Public Health staff provided "real time" data on the contamination level at several collection sites and within curbside collection in the City of Port Townsend through audits conducted by Public Health, Beyond Waste members, and volunteer high school students.

Staff reviewed program analysis, including initial contamination data, with the Board of County Commissioners (BoCC).

When work on the CROP began, the service agreement for recycling services with a private sector contractor had been extended beyond its original term to provide time to develop a Request for Proposals (RFP). The RFP process has been an integral part of developing the CROP with both processes informing the other.

A new recycling contract is nearing completion and the analysis of the current program, particularly the rate of contamination identified in the audits conducted by Public Health, will provide baseline data by which to measure changes to the contamination rate brought about by program revisions under the new service agreement.

CROP Development

The following steps were undertaken in the development of the CROP.

Step One – Program Analysis

Staff developed analysis of the recycling program and reviewed and refined this analysis with input from the SWAC and Beyond Waste action group. Materials reviewed with SWAC, Beyond Waste and the BoCC included:

- an inventory of current recycling collection services and programs
- an inventory of recycling program ordinances and policies
- a service-level comparison with other regional jurisdictions
- considerations of regional harmonization of accepted materials and multi-county facility and equipment sharing
- contamination data provided by Public Health’s audits
- data on the level of greenhouse gas emission reduction for each of the current materials in the recycling program and as a program whole and performance indicators for each material type
- an inventory of current marketing options
- the current alignment of accepted materials and processing of the materials with the Basel Convention Plastic Waste Amendments

Current Service Level

The Washington State Association of Counties Solid Waste Managers Affiliate, the Washington State Refuse and Recycling Association, and the Department of Ecology have supported the establishment of regional, and if possible, statewide uniformity in what materials are accepted for recycling and how they should be prepared. More harmonization across programs reduces customer confusion and contamination. To that end, they identified these four priority materials for statewide recovery:

1. Paper (including office and notebook paper, newspaper, mail, catalogues, magazines, and cereal or cracker boxes)
2. Cardboard
3. Plastic bottles and jugs (clear, colored, and natural)
4. Steel and aluminum cans

Jefferson County currently includes the above materials as well as glass in its source separated recycling program and will continue to for the foreseeable future. Curbside recyclables collection service is available by subscription to all residents in unincorporated Jefferson County and is included in curbside collection services within the City of Port Townsend as part of utility services.

All county residents may self-haul the above materials to collections sites in:

- Quilcene Rural Drop Box Facility
- Port Ludlow
- Port Hadlock
- Kala Point
- Port Townsend Transfer Station

The Port Ludlow and Port Hadlock sites are open to the public 24 hours a day, every day of the year. These sites see high levels of illegal dumping with the Port Hadlock site requiring the most maintenance of all sites. Security cameras and signage notifying customers of the cameras were installed at the Port Hadlock site with no discernable effect on illegal dumping.

Additional materials may be recycled at the Quilcene Rural Drop Box, Transfer Station and Moderate Risk Waste Facility. A comparison of Jefferson County’s recycling program to those of King County and Seattle was made in 2020 with the results shown in **Table 1** below:

Table 1: Recycling Service Level Comparison: Jefferson County, King County & Seattle

Service Options	Propane/Gas Cylinders	Computers/ Monitors	Televisions	Cans (aluminum, steel, tin)	Paper	Cardboard	Plastics	Glass	Scrap Metal	Automotive/ Marine Batteries	Household Batteries - Alkaline	Household Batteries - Lithion Ion	C&D	Clean Wood Waste	Sharps	Mercury Containing Lights	Major Appliances-Refrigerants	Major Appliances-Non-refrigerant
King County Facilities																		
Algona Transfer Station	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Tukwila Transfer Station	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
North Bend Drop Box	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Enumclaw Transfer Station	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Factoria Transfer Station	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Kirkland Transfer Station	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Renton Transfer Station	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Shorline Transfer Station	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Skykomish Drop Box	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Factoria MRWF	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Seattle Facilities																		
North Transfer Station (Wallingford)	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
South Transfer Station (Georgetown)	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
North Transfer MRWF (Wallingford)	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
South MRWF (Georgetown)	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Auburn Wastemobile (Mobile MRWF)	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Jefferson County Facilities																		
Quilcene Drop Box	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Jacob Miller Road Transfer Station	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
Boat Haven MRWF	♻️	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
KEY																		
♻️	RECYCLED																	
ⓧ	NOT ACCEPTED																	
♻️	DISPOSED OF AS MUNICIPAL SOLID WASTE																	

Key Findings

Public Works staff considered the potential for regional harmonization of accepted materials and multi-county facility and equipment sharing and contracting. Jefferson County is one of only a few counties that source separate recyclable materials and presently enjoys a lower contamination rate and higher commodity value relative to neighboring single or dual stream counties. Therefore, an adjustment of Jefferson County’s program to a single- or dual stream collection scenario would like increase contamination and program costs, making a regional approach counter-productive. This can be seen in the results of the Request for Proposal for Recycling Services which follows in **Step 2** of the CROP development process.

Public Works staff, in concert with Clallam County and Kitsap County staff, surveyed three Puget Sound area Material Recovery Facilities on the top five most problematic contaminants. These contaminants are listed in **Table 2** below:

Table 2: Top Five Problematic Materials Ranked			
	<i>Pioneer</i>	<i>JMK Tacoma</i>	<i>Republic</i>
1	Needles	Clothing/ Bedding	Batteries
2	Batteries	Diapers	Needles
3	Plastic Bags or Wraps	Flammables	Diapers
4	Diapers	HHW	Plastic Bags or Wraps
5	Tanglers	Needles	Flammables

Follow up communications with MRF operations managers revealed that the highest contamination load was in bales of commingled tin, aluminum and plastic (TAP).

The survey jointly conducted by Jefferson, Clallam and Kitsap Counties differs slightly from the one conducted by The Recycling Partnership (TRP) in 2019, in which MRFs and cities in Washington identified the following recycling contaminants as the most problematic and costly to manage:

- Plastic bags and film
- Tanglers including rope, cords, chains, and hoses
- Food and liquids
- Shredded paper
- Bagged garbage
- Non-program plastics
- Hypodermic needles

Recycling contamination can cause the following impacts:

- Slow down the sorting and processing of materials
- Reduce the quality and value of secondary material feedstocks
- Result in costly shutdowns
- Damage collection, processing, and remanufacturing equipment
- Cause serious injuries to collection and processing facility staff

According to The Recycling Partnership, the greatest costs associated with managing a contaminated recycling stream at MRFs nationally come from the following and represent 80% of total contamination-related costs:

- 40% for disposal of residuals
- 26% in value lost from contaminated recyclables
- 14% in labor to remove contamination from sorting equipment, etc.

In December, 2020, Public Health staff conducted an initial audit of recyclable materials from three self-serve collection sites and found the contamination rate of the co-mingled tin, aluminum and plastic as high as 35% with non-accepted plastics constitute the highest contaminant load in both the co-mingled tin, aluminum and plastic bin and in all other materials.

A second audit in June, 2021 found even higher rates of contamination despite targeted outreach to communities with high contamination rates. The results of that audit can be found in **Table 3** below:

Table 3: Contamination Rates by Collection Sites			
	Recycling Center	Port Ludlow	Quilcene
Mixed Paper	Dec. 2020 - 7%	Dec. 2020 - 5%	Dec. 2020 - 5%
	June 2021 - 4%	June 2021 - 6%	June 2021 - 9%
OCC	Dec. 2020 – 13.5%	Dec. 2020 - 17%	Dec. 2020 - 2%
	June 2021 - 8%	June 2021 - 22%	June 2021 - 20%
TAP	Dec. 2020 – 30%	Dec. 2020 - 30%	Dec. 2020 - 15%
	June 2021 - 16%	June 2021 - 35%	June 2021 - 28%
			** 61% with bagged garbage
Glass	Dec. 2020 – 10%	Dec. 2020 – 5%	Dec. 2020 – 4%
	June 2021 - 3%	June 2021 - 4%	June 2021 - 7%

Public Health also canvassed two neighborhoods in the City of Port Townsend to identify rates of contamination in curbside collection bins. The survey included 47 homes in one neighborhood and 50 in a second. TAP, Glass and Paper bins were inspected and contaminants for each bin tabulated. **Table 4** below shows the percentage of total homes in the neighborhood that had the type of contaminant found in the bins.

Table 4: Curbside Collection Contamination Survey			
Material Type	Contaminant	Howard Street (% of the 47 homes with contaminant)	Sheridan Street (% of the 50 homes with contaminant)
TAP	Lids on bottles	13%	16%
	Clamshells, tubs, etc.	49%	70%
	Drink lids	32%	56%
	Food contamination	9%	20%
	Other plastics (#'s 3-7)	17%	2%
	Other contamination	15%	42%
Glass	Blue glass	2%	0%
	Metal lids on bottles	19%	16%
	Light bulbs	0%	0%
	Food contamination	6%	0%
	Other contamination	0%	2%
Paper	Cartons	2%	4%
	Drink cups	0%	0%
	Other	2%	0%

Visual audits of collection bins show that paper, cardboard and glass are generally free of most contaminants but non-accepted plastics constitute the highest contaminant load in both the co-mingled tin, aluminum and plastic bin and in all other materials

Public Works staff used the Environmental Protection Agency’s Waste Reduction Model to calculate the greenhouse gas (GHG) reduction created by recycling each of the materials currently accepted in the

program and developed a cost per metric ton of CO2 emission (MTCO2E) reduction for each, allowing for a measure of return on investment. These calculations can be seen in **Table 5** as follows:

Material	2020 Material Tons Shipped	Percent of Total Tonnage	Base MTCO2E (Landfill)	Alternate MTCO2E (Recycled)	Change (Alt - Base) MTCO2E	Change in MTCO2E by Material Ton	Cost to Recycle (Direct Expense + General + Admin.)	Cost per MTCO2E Reduced
Corrugated Containers	1234	33.5%	-237	-3969	-3731	-3.02 \$	206,615 \$	55
Mixed Paper (primarily residential)	1001	27.2%	-316	-3788	-3471	-3.47 \$	167,560 \$	48
Mixed Paper (primarily from offices)	18	0.5%	-10	-182	-172	-9.29 \$	3,095 \$	18
Mixed Plastics	128	3.5%	9	-106	-115	-0.90 \$	21,378 \$	186
Aluminum Cans	192	5.2%	13	-1595	-1608	-8.39 \$	32,067 \$	20
Steel Cans	192	5.2%	13	-318	-331	-1.73 \$	32,067 \$	97
Glass	922	25.0%	79	-275	-354	-0.38 \$	154,248 \$	436
Totals	3686	100%	-450	-10232	-9782		617,029	

Public Works staff worked with the Beyond Waste group to compare each recycled material by five areas of performance which included: annual MTCO2E reduction; lowest cost per MTCO2E reduction; lowest rate of contamination; lowest subsidy (difference between cost to deliver to market and market value), and; value retention (the ability to be recycled more than once). The results of the comparison are found in **Table 6** below:

Tons of GHG Reduction		Lowest Cost per Ton of GHG Reduction		Lowest Rate of Contamination		Lowest Subsidy		Value Retention	
Measured as the total metric ton of CO2 reduction in 2020 caused by recycling vs. landfilling.		The sum of direct costs, general and administrative costs, plus County labor applied to ea. material as a percentage of the total tonnage.		Contamination rate established by 2020 audit of 3 sites. Aluminum Cans, Steel Cans and Mixed Plastic are ranked together because of their combined processing.		"Subsidy" is the difference between the commodity price paid for the materials and the actual cost to collect, process and deliver the materials to buyers. Aluminum Cans, Steel Cans and Mixed Plastic are ranked together because of their combined processing.		"Value Retention" is the ability of the material to retain its properties in the manufacturing process and to replace virgin materials.	
Corrugated Containers	7	Mixed Paper (primarily from offices)	7	Mixed Paper (primarily from offices)	7	Mixed Paper (primarily from offices)	7	Glass	7
Mixed Paper (primarily residential)	6	Aluminum Cans	6	Corrugated Containers	6	Aluminum Cans	6	Aluminum Cans	7
Aluminum Cans	5	Mixed Paper (primarily residential)	5	Mixed Paper (primarily residential)	5	Steel Cans	6	Steel Cans	7
Glass	4	Corrugated Containers	4	Glass	4	Mixed Plastics	6	Corrugated Containers	4
Steel Cans	3	Steel Cans	3	Aluminum Cans	3	Corrugated Containers	3	Mixed Paper (primarily residential)	2
Mixed Paper (primarily from offices)	2	Mixed Plastics	2	Steel Cans	3	Glass	2	Mixed Paper (primarily from offices)	3
Mixed Plastics	1	Glass	1	Mixed Plastics	1	Mixed Paper (primarily residential)	1	Mixed Plastics	1
Total Scores									
Mixed Paper (primarily from offices)	26								
Corrugated Containers	24								
Aluminum Cans	27								
Mixed Paper (primarily residential)	19								
Steel Cans	22								
Glass	18								
Mixed Plastics	11								

Identifying whether MRFs are operating in accord with the Basel Convention Amendments for mixed plastic was challenging because the final disposition of materials is considered by the MRFs to be confidential business information and MRFs maintain confidentiality agreements with local health jurisdictions and the Department of Ecology which make this information exempt from public disclosure.

Step 2 – Recycling Services RFP

Staff solicited an RFP for the Collection, Processing and Marketing of recyclable materials. This RFP yielded two (2) proposals. The proposals and staff’s analysis of the responses were reviewed with SWAC and the BoCC.

The current service provider, Skookum Contract Services, proposed a program essentially the same as the current source separated program but with the exclusion of any plastic beyond bottles and jugs. Other items labeled #1, such as clam shells and to go containers, are not accepted.

The County’s only G-Certificate Hauler, Waste Connections, Inc., proposed a curbside-only program that would provide a single bin for all materials (OCC, TAP and mixed paper) except glass, with glass to be collected at the Port Townsend Transfer Station and Quilcene Rural Drop Box facility.

Staff found a larger cost/benefit in the Skookum Contract Services proposal and has begun to negotiate a contract for services.

The RFP asked for annual costs for a proposal with plastics “in” and “out” of the accepted materials list with the hope that this would demonstrate the costs and other impacts on the recycling system from contamination. However, the pricing structure offered by regional Material Recycling Facilities (MRFs) assumes a level of contamination found in the single or dual-stream (glass “out”) programs that are the regional standard. As such, both proposals offered no difference in annual fees for a program that did or did not collect plastic, the largest contributor to contamination found in the County’s recycling stream.

The RFP also asked that the proposer list the June 2021 average per ton cost or revenue for OCC, TAP, glass and mixed paper from the MRF or other buyers to be used in the proposal. Staff applied the commodity values as submitted to the County’s previous three (3) year tonnage average for each commodity to forecast potential revenue.

The Skookum Contract Services proposal (source separated) was estimated to produce an annual revenue of \$357,767 whereas the Waste Connections, Inc. proposal (dual stream) was estimated to produce an annual revenue of \$148,618.

This discrepancy between estimated commodity values may be as close as the County will be able to identify the actual cost and impact to contamination for Jefferson County. Surveys conducted by The Recycling Partnership have identified costs regionally.

Both proposers were able to provide information for the domestic markets used by MRFs for sale of #1 and #2 plastics.

Step 3 – Program Revisions

The Skookum Contract Services proposal includes the following program revisions which will address contamination:

- A shift to redefining the plastics accepted from the currently accepted #1, #2 and #5 labeled plastics to an easier to describe “bottles and jugs” only
- The provision of a full time, on-site recycling coach to assist customers at collection sites on proper recycling

These revisions will be made to the program pending recycling contract ratification and following the following the schedule in **Table 7** as follows:

Table 7: Contamination Reduction Action Items and Schedule			
Completion Date	Contamination Reduction Action Item	Responsible Party	Estimated Cost
Q4 2021	Develop messaging about the shift to bottles and jugs	Public Works & Public Health	\$2,500-\$3,000
Q1 2022	Distribute messaging via press releases, social messaging, web site, sandwich boards at drop off sites and mailers	Public Health	\$42,567
Q1 2022	Remove and replace signage at collection sites	Public Works	\$10,000
Q1 2022	Begin on-site customer education per recycling services contract	Skookum Contract Services	As part of the service agreement
Q3 2022 – Q4 2023	Measure contamination rate and adjust contamination reduction education and outreach strategies accordingly with input from SWAC	Public Health	\$14,189
Q2 2024	Provide SWAC with an evaluation of the anti-contamination strategies and develop next steps	Public Works & Public Health	\$2,500 - \$3,000
Total estimated cost for CROP implementation:			\$71,756-\$72,756