



Protocol for the Determination of Contamination Rates and Resulting Actions

This document provides an overview of Circular Materials’ process for auditing, determining contamination rates and contamination reduction plans.

This approach has been tested and proven successful in jurisdictions such as British Columbia where overall contamination rates have seen improvements since the start of the program.

Audit Sampling and Security Protocol

Circular Materials will collect audit samples from a municipality or First Nation community (Entity). The audit samples will be determined using the following considerations:

- Size of entity – number of households;
- Single stream vs two stream – split by tonnes collected in the province; and
- Single family households vs multi-family dwellings – based on counts provided by Entities.

A sample schedule will be provided to each Receiving Facility (RF) or Pre-Conditioning Facility (PCF) acting as an RF a minimum of one week prior to the beginning of the month. The schedule will be similar to the following:

Single Family or Multi-Family	Collection Category	Receiving Facility Name	Facility Code	Collector Name	Municipality	Week	Date or Truck of Week	Time
Single Family	Single Stream	Receiving Facility #1	RF1	Fero	Entity 98	07/01 to 07/05	2024-07-02	13:10
Multi-Family	Single Stream	Receiving Facility #1	RF1	Fero	Entity 98	07/01 to 07/05	anytime	
Single Family	Fibre Materials	Receiving Facility #1	RF1	Miller	Entity 80	07/15 to 07/19	2024-07-15	10:51
Single Family	Container Materials	Receiving Facility #1	RF1	Miller	Entity 80	07/15 to 07/19	2024-07-16	15:56
Single Family	Single Stream	Receiving Facility #1	RF1	Southern Sanitation	Entity 92	07/22 to 07/26	2024-07-24	12:26
Multi-Family	Fibre Materials	Receiving Facility #1	RF1	Fero	Entity 98	07/22 to 07/26	2nd	
Multi-Family	Container Materials	Receiving Facility #1	RF1	GFL	Entity 106	07/22 to 07/26	3rd	

Training on how to read and take samples will be provided to RF employees.

Audit Process

1. A sample will be immediately taken upon arrival of the single family/multi-family dwelling truck. The identified truck will be directed to a clear opening on the tip floor where the contents will be emptied.
2. A 100kg sample will be taken as per Circular Materials’ requirements.
3. Materials from the truck will first be mixed with a front-end loader/skidsteer. Once mixed, material will be dropped into a specialty audit sample supersac. Any material which falls over the side of the supersac and onto the ground is not to be picked up to avoid selection bias in the samples. A second bucketload can be added if necessary to fill the supersac.
 - a. Generally, one supersac is needed for single stream and fibre samples and two supersacs for container samples that reach the required 100kg.
 - b. At no time are more than two supersacs to be used.
4. Each supersac is zipped closed and sealed with a Circular Materials-provided serialized zip tie. The supersac sample will be clearly marked with a tag identifying the source (route, truck

number, municipality, collection service provider), the material sampled (i.e., fibre material, container material, single stream), date and time of the audit sample and the zip tie number.

5. The individual in charge of the audit sampling will film the audit sampling process and keep the file for a minimum of 45 days after the end of the month, available for viewing by Circular Materials. The file name will be associated with the time and location of the audit sample taking the unique serial identification number zip tie and the tag.
6. The weight of each supersac will be taken and recorded for each sample right on the identification tag.
7. Once the sample is taken and sealed, the sample will be placed in a secure area until it is picked up for transport to the auditing centre.

Audit Sorting Protocol

1. A full-time audit team will be stationed at the auditing centre to complete audits in real-time. Upon arrival at the auditing centre, the supersacs will be removed from the truck and taken to the secure sample storage area.
2. The samples will be sorted in a large, secure room where sorting tables and sorting bins are clearly marked with each material category.
3. A unique serial identification number zip tie will be removed at the start of the audit of each sample and will be retained for future reference.
4. Each sample will be sorted individually. Scales will be certified for trade with the certificates stored at the site for ease of review by the Circular Materials representative. The tare weights of all bins will be clearly marked right on the bin which will be reset each week.
5. All samples will be completely sorted and all materials weighed with all bins emptied before moving onto the next audit.
6. The information from each audit sample will be immediately entered into a computer and the total weight tallied. This weight will be compared to the audit sample weight to ensure consistency between the total sample weight and the total weight of the categorized materials.

Audit Verification

To support sufficient coverage and accuracy, Circular Materials will set up at least two cameras at the audit centre to view the auditing process as it occurs. If there is any discrepancy over the results of the audits, this process will ensure the audit process can be reviewed to confirm accuracy.

Having all the audits completed at one location provides a number of key advantages:

- Higher quality audits with consistency in the auditing approach;
- Ability to consistently train and oversee all staff at the same time;
- Support back-ups to oversee audits if an auditor needs to depart from one of the RFs/PCFs or other designated audit sampling locations,
- Provide real time data with the sampling of each audit – no month end rush of data points;
- Less likelihood of a “lost” or “contaminated” sample resulting from having to store samples for a month at a time prior to sorting;
- Ability to oversee each and every audit daily;



- Ability to see first-hand and provide for proper distribution and assignment of new and emerging packaging into the proper categories (and to see new possibly difficult-to-manage packaging types);
- Ability to see all types of non-PPP received to support the development of targeted public education and promotion programs and feedback to collectors;
- Cost effective and efficient – doesn't require sending representatives to oversee audits at various locations every month; and
- Enables efficiencies thereby reducing the risk associated with statistically insufficient data particularly as collector report cards must have accurate data in support of any conclusions.

Extrapolating Results to Entities and Collectors

The results of the audits are known by collector and by day of the week (i.e., in effect by route). Circular Materials will not use single data points for the purpose of extrapolating contamination rates for any Entity.

Report cards on contamination are based on all audits taken for an Entity/Collector over a period of six months. All audits will be combined on a normalized basis, i.e., the contamination rate is determined not by averaging each sample, but because sample sizes vary, the contamination rate is calculated at percentage per 100kg. A bare minimum of two (preferably three or more, respecting size of community will be a factor, for example, small communities may only be randomly selected infrequently) will be taken before a report card will be generated.

The results of the calculations will be presented by material category to each Entity/Collector, with an accounting of the overall contamination rate for the period.

Entities/Collectors Exceeding Contamination Targets

Circular Materials' overall goal for contamination is 4%. Note any packaging or paper material designated under the Stewardship Plan, regardless if it is considered recyclable at this time or not (e.g., multi-material, multi-laminated pouches), are not considered contamination for the purposes of calculating the overall contamination rate.

The focus will be on starting with those Entities/Collectors which are the farthest from the target. Where an Entity/Collector is identified as having a contamination rate which needs attention, a meeting will be arranged with the Entity/Collector to review the results in more detail. The Contamination Reduction Plans will be implemented in phases as necessary.

Phase 1: Initial Contamination Reduction Plan

Where warranted, Circular Materials will request the Entity/Collector to develop a Contamination Reduction Plan to address the contamination issue. As the audit results will be broken down into more than 50 categories, the results will likely point to where attention is needed to reduce the contamination rates. This will give the Entity/Collector an area of focus to support behaviour change and further public promotion and education. Circular Materials will support Entities in developing their Contamination Reduction Plan, as well as develop and deploy educational materials for commonly occurring contaminants in the audits.

The Entity will submit its Contamination Reduction Plan for review by Circular Materials. Upon approval by Circular Materials, the Entity/Collector will implement the plan. A further six months of samples will be taken and, perhaps, if warranted, additional samples will be taken to evaluate the effectiveness of the



Contamination Reduction Plan. The results of the next six months of audits will be shared with the Entity/Collector.

If the contamination rates show significant improvement, e.g., moving from 20% to 15%, Circular Materials will ask the first Contamination Reduction Plan to be continued, but no Service Level Failure Credits will be applied.

Phase 2: Follow-up Contamination Reduction Plans

Where contamination rates have not improved or improved only marginally, a second Contamination Reduction Plan will be required from the Entity/Collector. The expectation will be for an enhanced approach with more frequent or targeted communication for a route, greater effort to sort out contamination ahead of collection (e.g., leaving materials behind with “oops” stickers). At this point, no Service Level Failure Credits will be applied.

The cycle will continue as necessary where continuous improvement in the contamination rates is not seen. If after a third round of preparing and implementing a Contamination Reduction Plan fails to show improvement in the contamination rates, only then, and at the discretion of Circular Materials, will Service Level Failure Credits will be applied.

Overall, from the beginning of the process until the completion of three rounds of Contamination Reduction Plans, the process will take between 18 and 24 months. The critical factor in avoiding any Service Level Failure Credits, even if 4% is not achieved after this period, is Circular Materials seeing continuous improvement.

Circular Materials will support the development of effective Contamination Reduction Plans.

Through its promotion and education plans, Circular Materials will employ strategies and tactics aimed at educating and influencing recycling behavior. This includes, but is not limited to, educating consumers on the material accepted within the collection system, how to prepare materials for placement in the blue box collection system, and where collection systems can be accessed. A number of communication tools will be deployed to address contamination and maximize reach.

Once Circular Materials establishes a consistent the blue box recycling program across the province with a harmonized list of acceptable materials, promotion and education will be implemented at a larger scale.

Questions

If you have questions about this process, please contact us at NBoperations@circularmaterials.ca.