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THERMOSTAT RECYCLING

Annual Report to the Director

2023 Calendar Year
BRITISH COLUMBIA

Submitted to:

Director, Extended Producer Responsibility Programs
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June 14, 2024

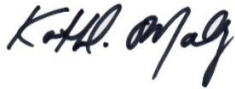


Thermostat Recovery Program 2023 Report to Director, Waste Management

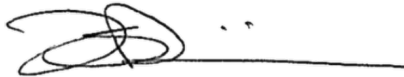
June 14, 2024

This annual report is issued by the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) in accordance with the British Columbia Recycling Regulation (Reg. 449/2004). The 2023 annual report documents the Thermostat Recovery Program's activities and results in British Columbia from January 1 to December 31, 2023.

Any questions or comments about this report as well as the Thermostat Recovery Program operations should be directed to HRAI at:



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Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI)
Date: June 14, 2023

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TABLE OF CONTENTS

1. Executive Summary	3
2. Program Outline	4
3. Public Education Materials and Strategies	5
3.1. Initiatives	5
3.2. Resources.....	6
4. Collection System and Facilities.....	7
4.1. Collection System Overview	7
4.1.1. Collection Facilities	8
4.1.2. Collection Points	8
4.2. Coverage in Regional Districts	9
5. Product Environmental Impact Reduction, Reusability and Recyclability.....	10
6. Pollution Prevention Hierarchy and Product / COMPONENT Management	11
7. Product Sold and Collected and Recovery Rate.....	14
8. Summary of Deposits, Refunds, Revenues and Expenditures	14
9. Plan Performance	14
9.1. Progress toward Collection Targets.....	15
9.2. Amount Collected by Regional District.....	16
Appendix A - Media.....	17
RCBC Recyclepedia.....	17
City of Penticton Collection Calendar	18
City of Mission Collection Calendar	18
McBride Recycling Round-Up Event	19
HPAC Magazine Ad (Industry Publication).....	19
TRP Marketing.....	20
HRAI Newsletter Ads.....	21
Appendix B – Third Party Assurance	22

1. EXECUTIVE SUMMARY

Products within plan	Thermostats (electronic and mercury-containing)
Program website	www.hrai.ca/trp *

Reference		Summary (5-bullet maximum)
Recycling Reg. 449/2004	TRP Annual Report 2023	
Part 2, Section 8(2)(a)	3. Public Education Materials and Strategies	<ul style="list-style-type: none"> • Print ads and e-blasts with the HPAC magazine; ads in regional district and municipal recycling calendars • Outreach through HRAI’s Weekly Newsletter • Collaborations through Stewardship Agencies of BC (SABC) • Recycling Council of British Columbia (RCBC) hotline and Recyclepedia
Part 2, Section 8(2)(b)	4. Collection System and Facilities	<ul style="list-style-type: none"> • 368 total collection points • 3 new collection points • 1 main collection facility • Collection points in 27 Regional Districts
Part 2, Section 8(2)(c)	5. Product Environmental Impact Reduction, Reusability and Recyclability	<ul style="list-style-type: none"> • 3,838 mercury-containing vessels collected[†] • 3,823 electronic thermostats collected • 67 kilograms of metals recycled • 194 kilograms of plastics from thermostat housings collected, but not recycled due to low-quality plastic and no global end markets (See Section 6 for details). • 0 new mercury-containing thermostats sold into the market.
Part 2, Section 8(2)(d)	6. Pollution Prevention Hierarchy and Product / Component Management	<ul style="list-style-type: none"> • Recovered thermostats are not suitable for reuse • New thermostat designs do not contain mercury, and are more energy efficient than older mercury-containing models • Over 99% of metal components are recycled with a high degree of certainty • Over 99% of the batteries are recycled with a high degree of certainty • In 2023, approximately 76% of all collected materials (i.e. mercury, glass and plastics) were not recycled due to global market changes, market demand, environmental concerns, or quality impurities (See Section 6 for details)

* In 2016, HRAI took full management of Scout Environmental’s *Switch the ‘Stat (S.T.S.)* program, fully re-branding it and renaming it Thermostat Recovery Program (TRP), website found at www.hrai.com/trp.

[†] Although mercury-containing thermostats can contain anywhere between 1 and 4 switches, a study conducted by Veolia on behalf of the U.S.’s Thermostat Recycling Corporation found the average number of mercury switches per thermostat to be 1.4. This continues to be the industry standard weight conversion factor used to estimate mercury-containing vessels collected as all thermostats manufactured since 2008 have not included mercury components in their designs.

Thermostat Recovery Program 2023 Report to Director, Waste Management

Reference		Summary (5-bullet maximum)
Recycling Reg. 449/2004	TRP Annual Report 2023	
Part 2, Section 8(2)(e)	7. Product Sold and Collected and Recovery Rate[‡]	<ul style="list-style-type: none"> Collected 3,432 mercury containing thermostats, 3,823 electronic thermostats, and 161 loose mercury vessels Adjusted total: 3,432 mercury-containing thermostats and 3,823 electronic thermostats, for a total of 7,255 collected (26% increase from 2022 collection results)
Part 2, Section 8(2)(e.1)	9. Plan Performance	See 9.2 for breakdown per regional district.
Part 2, Section 8(2)(f)	8. Summary of Deposits, Refunds, Revenues and Expenses	N/A
Part 2, Section 8(2)(g)	9. Plan Performance[§]	N/A

2. PROGRAM OUTLINE

The Thermostat Recovery Program (TRP) is the designated program for managing all types of thermostats, both electromechanical (mercury-containing) and electronic models, in British Columbia. The British Columbia Stewardship Plan for Thermostats is the unofficially approved five-year plan for recovering these products, and spans a timeline of July 1, 2015 to June 30, 2020. A new five-year plan will be submitted by February 18, 2025 for a timeline of July 1, 2025 to June 30, 2030.

- Electromechanical thermostats (also referred to as “mercury-containing thermostats”), which contain internal mercury switches (mercury in a sealed glass bulb) or snap switches to control the flow of electrical current; and
- Electronic thermostats (also referred to as “programmable thermostats”), which use sensors instead of switches to detect temperature levels and control the flow of electrical current.

The Thermostat Recovery Program is funded by thermostat manufacturers who have sold thermostats into Canada and a complete list of registered thermostat manufacturers is available online at: <https://www.hrai.ca/program-facilitators>. The program is fully administered by the Heating, Refrigeration, and Air Conditioning Institute of Canada (HRAI) on behalf of the manufacturers and supported by the Canadian Institute of Plumbing and Heating (CIPH).

In accordance with the program plan, the TRP collects thermostats in the province of British Columbia through one primary collection channel (HVAC contractors/wholesalers) and two secondary collection channels (drop-off locations and a send-back option). Based on estimates that 85 to 90% of thermostats sold in British Columbia are done through contractors and wholesalers in the HVAC industry, this group

[‡] Thermostat Recovery Program does not report on Product Sold or Recovery Rate; see [Section 7](#) for details.

[§] Targets specified in the approved product stewardship plan are not applicable to the 2022 reporting year, therefore program performance will not be reported in relation to targets throughout this annual report.

adopts the primary channel through which all types of thermostats are recovered. Some manufacturers do not sell to retail.

The collection process for 2023 remained the same as 2022. The program registration process is completely automated into a short online form on the TRP's website. This allows registrants to click a checkbox to read and agree to the terms of the *Transportation of Mercury-containing Thermostat Agreement*. All participants have the option to register as a public drop-off location, an option often used by wholesalers, recycling centres, regional districts, and municipal depots. The TRP website offers an up-to-date public drop-off location lookup directory, which lists all participating TRP drop-off locations within a 50 km radius of a Canadian postal code. This drop off location tool is available online at: <https://www.hrai.ca/public-drop-off-locations>.

Upon registering as a Collection Point or a Public Drop-Off Location, participants receive a 5.0-gallon collection pail and pre-paid Purolator return shipping waybill delivered to their location for thermostat collections. Once returned for recycling, these participants automatically receive replacement materials for continued collections. Those who register under the program's Send-it Back option (often residents and consumers unable to reach a Public Drop-Off Location) receive a smaller 1.25-gallon collection pail and pre-paid Purolator return waybill to be used to return a small amount of thermostats on a one-time basis. Together, these channels comprise all of the programs participants, or collection points, as they shall be referred to throughout this report (see [Section 4](#) for term definitions).

As per the requirements under the British Columbia Recycling Regulation, this report has been prepared to summarize the program activities undertaken during the calendar year of 2023, and will be posted on the program website at <https://www.hrai.ca/program-results-trp>.

3. PUBLIC EDUCATION MATERIALS AND STRATEGIES

3.1. Initiatives

Thermostat Recovery Program operates by collecting thermostats through existing businesses and infrastructure, referred to in the program plan as "collection channels." As described in [Section 2](#), the program uses one main collection channel (HVAC contractors/wholesalers) and two secondary collection channels (drop-off locations and send-back option) to recover end-of-life mercury-containing and electronic thermostats.

Continuing to build on the foundation laid since 2011, in 2023 the TRP team began closely collaborating with HRAI's Creative, Communications and Marketing Director to develop a 2023 TRP Marketing Plan. This strategic plan identifies challenges and areas of improvement in current marketing and outreach initiatives, and details a project management plan and critical path with the goal of lifting the visibility and awareness of the program while promoting uptake and engagement with manufacturers and participating collection points. Key areas of focus in 2023 were:

- To strengthen communication efforts with registered participants, maintaining commitment to the program and increasing thermostat collections;
- To broaden the reach and variety of communication channels used, improving program accessibility and raising awareness on responsible thermostat;
- To engage thermostat manufacturers to commit to building visibility to their audience for their involvement with the TRP;

Thermostat Recovery Program 2023 Report to Director, Waste Management

- To extend outreach efforts to the general public, encouraging new participants to register and further expanding program reach and awareness, in turn diverting more thermostats from landfill.

To achieve these goals, the following initiatives were undertaken:

Initiative	Details	Audience/ Channel	Type of Outreach
Ongoing outreach with HRAI National Office	HRAI's Spring and Fall review magazines, as well as several editions of the bi-weekly newsletter featured TRP program updates and information to register and participate.	HVACR Contractors, Wholesalers	Industry outreach (print)
Outreach in HRAI weekly newsletter	New in 2023, a plan was created to place regular ads in the HRAI newsletter. 18 ads were placed including 2 Earth Day ads in April, 3 Waste Reduction Week ads in October and 5 Pail Sweep Campaign ads in November.	HRAI members, HVACR Contractors, Wholesalers	Industry outreach (Online)
BC Stewards Stewardship Agencies of BC (SABC)	Formalized association of all BC Stewardship Associations, allowing stewards to present a united front and communicate collaboratively with various stakeholder groups <ul style="list-style-type: none"> • BC Recycles website provides an overview of each product stewardship organization (including TRP) • Recycling Handbook, provides an overview of each product stewardship organization (including TRP) • Action Plan developed by SABC to ensure the success of all programs, investigate potential gaps, and address feedback from BC Ministry of the Environment Climate Change Strategy 	General Public	Print media (Online)
Recycling Council of BC (RCBC)	Info about the program (materials accepted at nearest drop-off locations) made available to the public through a hotline, website and online tool (the Recyclepedia app). In 2023: <ul style="list-style-type: none"> • 43 phone hotline inquiries • 220 website searches • 105 app searches 	BC Waste Management Industry General Public	Online & Phone
Regional District/Local Gov't Media	<ul style="list-style-type: none"> • TRP ad and link to drop off locations included in the City of Mission and City of Penticton. • TRP participated in the City of McBride's Recycling Round Up event 	General Public	Print Media (Online)
Industry Magazines	<ul style="list-style-type: none"> • TRP advertisements included in the February, October and December issues of the Heating, Plumbing and Air Conditioning (HPAC) Magazine 	HVACR Contractors, Wholesalers	Print Media (Online)

In addition to the efforts listed above, the program is promoted through various voluntary channels. The outcomes of the program's outreach initiatives will be used along with collection trends to inform future program performance targets. For examples of outreach initiatives, please refer to [Appendix A](#).

3.2. Resources

To support these initiatives, many of the program's promotional and educational materials were redesigned to further guide and support program participants. These materials are described below.

Thermostat Recovery Program 2023 Report to Director, Waste Management

1. **Program Website:** The program's website www.hrai.ca/trp continues to be one of the primary educational tools, featuring content designed to educate contractors, wholesalers, and the general public. The site features a program overview, a description of mercury and its associated impacts, an online program registration form, and more. Other noteworthy features on the website are the Public Drop-off Locations lookup tool and an up-to-date cumulative collections counter that indicates the total thermostats and mercury vessels collected, as well as the weight of mercury recovered, in kilograms. The website content was updated in 2023.
2. **Program Information Documents:** The program information document used in 2023 was an updated version of that used in previous years, containing the pertinent information for new registrants; next steps and collection guidelines. Upon registering, participants receive a *Welcome Letter* via email, including the *Program Information Document*, confirming receipt of their registration form and the order of their program collection kit. This letter helps new registrants manage expectations, address program inquiries and develop commitment to the program.
3. **Posters:** Newly-registered participants designated as drop-off locations are automatically sent a poster upon registration, along with their collection kits. These colourful, eye-catching promotional posters are available to all participants for on-site display.
4. **Brochures:** Printed promotional brochures are sent to new participants upon registration. These are also available at request for distribution to participants, and includes information about the Thermostat Recovery Program and contact information, what's accepted/not-accepted, and instructions on how to participate.
5. **Collection Container Labels:** All of the TRP's collection pails are labeled with the program logo and branding, with warnings to restrict collections to intact thermostats only and not to dispose of with regular waste. This serves as a visual reminder for participants and helps ensure compliance with program goals.
6. **E-mail Pail Sweeps:** During the 2023 calendar year, the TRP sent an e-blast on November 8th with an eye-catching campaign urging program participants to continue collection efforts and a call to action for participants to return collection pails that are more than half full (refer to Appendix A).

4. COLLECTION SYSTEM AND FACILITIES

4.1. Collection System Overview

The Thermostat Recovery Program collection system is comprised of the following:

1. Collection points (program participants)
 - Comprised of the aforementioned 3 collection channels (details in [Section 4.1.2.](#))
 - Participants collect thermostats in program-provided pails before returning them to the collection facility
2. Collection facility
 - Aevitas Inc. continues to be the program's sole collection facility, receiving and processing the contents of thermostat collection pails from all participants
3. Consolidation points
 - All mercury-containing vessels are shipped to a retort facility at least once a year

4. Retort facility

- Final processing site of Hg vessels
- Bethlehem Apparatus Co. Inc., located in PA, USA

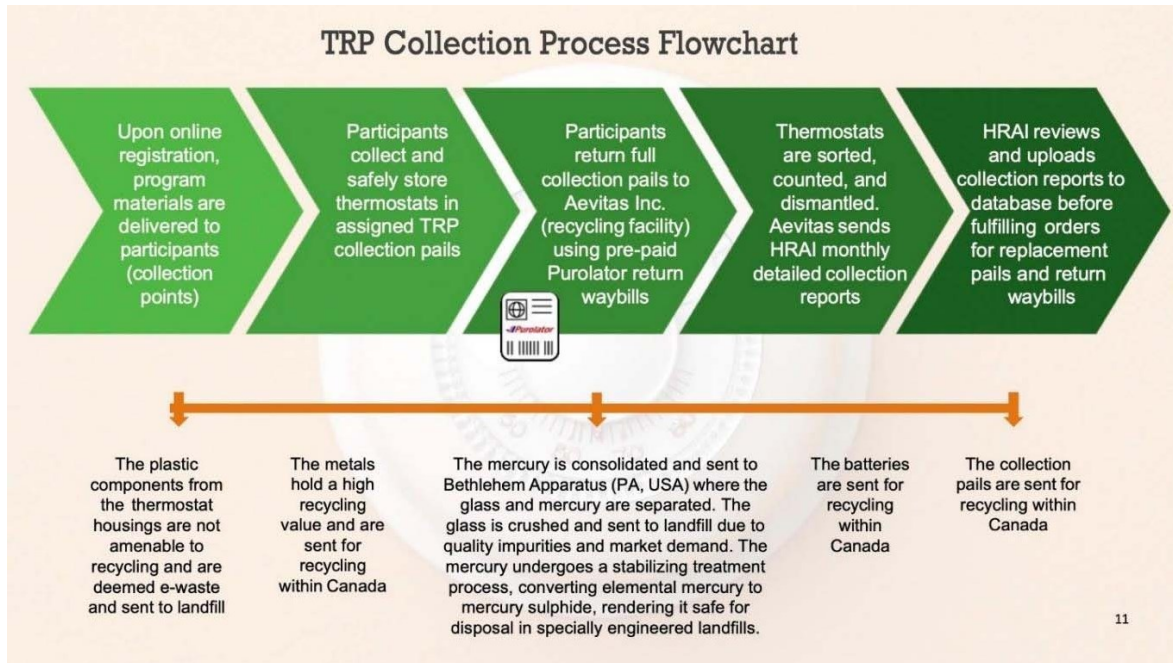


Figure 1. Thermostat Recovery Program collection process in Canada (incl. British Columbia)

4.1.1. Collection Facilities

In 2023, Aevitas Inc. located in Ayr, Ontario continued to serve as the TRP’s sole consolidation point for all thermostat collections from BC, housing Canada’s only approved mercury retort facility ([Aevitas’ website](#)). Upon receiving collection pails from participants across the country, including BC, Aevitas processes the materials returned, keeping detailed monthly records of the pail contents and properties. These reports include the source company and contact as indicated on the return waybill, the total number of thermostats in each pail (including a breakdown by type and brand-holder), the number of mercury vessels, number of batteries, the weight of plastic, metal, glass and mercury, as well as any off-spec materials included in the pails. These monthly collection reports are reviewed and uploaded into the TRP’s database for record keeping and performance tracking.

4.1.2. Collection Points

The Thermostat Recovery Program uses three collection channels: the contractor/wholesaler channel, public drop-off locations, and the send-back channel. Individual program participants in each of the channels are referred to as “collection points” or “participants”. These participants play an integral role in the program’s collection operations, accumulating end-of-life thermostats in TRP-provided collection containers until they are full, at which point they use their pre-paid Purolator return waybill to return the thermostats to Aevitas Inc. This process is illustrated below:



The total number of registered participants in 2023 was 368, across all collection channels. Through the outreach initiatives described above, 3 new businesses registered as collection points for end-of-life thermostats in 2023. BC’s registered participants are made up of 290 contractors/wholesalers, representing 79% of all BC participants, 76 regional district/municipal drop off collection sites, representing approximately 20% of all BC participants, and two consumer send-back, representing approximately 1% of all BC participants.

The TRP is accessible to residents of the province of BC through the use of our free send-back channel, if they are unable to reach a registered collection point. The free send-back channel service is not restricted and is open to those who request it.

The following table lists the 3 new collection points that registered in 2023, indicating the type of business, whether they opted to be a drop-off location and the city where the business is located.

Company Name	Type	Drop Off	City
Ron’s Heating and Colling	Contractor	No	Agassiz
BC Care Heating Services	Contractor	No	Burnaby
Pacific Controls	Wholesaler	No	Victoria

4.2. Coverage in Regional Districts

During 2023 database housekeeping practices, the TRP team identified program participants that are no longer actively collecting/returning thermostats for various reasons (e.g. no longer in business, new ownership, etc.), flagging their participant profiles as “inactive”. This helps maintain an accurate list of collection points and drop-off locations that are actively participating in the program. Combining new participants with existing collection points as of December 31, 2023, there were 368 active collection points in British Columbia.

Thermostat Recovery Program 2023 Report to Director, Waste Management

The breakdown of collection points per regional district is as follows:

Region	Number of Collection Points
<i>Alberni–Clayoquot Regional District</i>	2
<i>Capital Regional District</i>	42
<i>Cariboo Regional District</i>	4
<i>Columbia–Shuswap Regional District</i>	18
<i>Comox Valley Regional District</i>	10
<i>Cowichan Valley Regional District</i>	13
<i>Fraser Valley Regional District</i>	33
<i>Metro Vancouver Regional District</i>	120
<i>Central Coast Regional District</i>	1
<i>Peace River Regional District</i>	11
<i>qathet (Powell River) Regional District</i>	4
<i>Bulkley–Nechako Regional District</i>	5
<i>Central Kootenay Regional District</i>	5
<i>Central Okanagan Regional District</i>	15
<i>East Kootenay Regional District</i>	7
<i>Fraser – Fort George Regional District</i>	9
<i>Kitimat–Stikine Regional District</i>	7
<i>Kootenay Boundary Regional District</i>	4
<i>Mount Waddington Regional District</i>	2
<i>Nanaimo Regional District</i>	11
<i>North Okanagan Regional District</i>	9
<i>Okanagan–Similkameen Regional District</i>	10
<i>North Coast (Queen Charlotte) Regional District</i>	3
<i>Squamish–Lillooet Regional District</i>	4
<i>Strathcona Regional District</i>	4
<i>Sunshine Coast Regional District</i>	5
<i>Thompson–Nicola Regional District</i>	10
Total	368

As demonstrated in this table, TRP collection points are currently present in 27 of British Columbia’s 28 regions. The region in which TRP does not yet have participants is the Stikine Region.

5. PRODUCT ENVIRONMENTAL IMPACT REDUCTION, REUSABILITY AND RECYCLABILITY

Historically, all components recovered through the Thermostat Recovery Program have been recycled, including the plastics, metals, glass, and any electronics associated with the thermostat. Plastics from the thermostat housings recovered through the program during the 2023 calendar year were not recycled due the low quality not being amenable to recycling and no market value. All other components, except glass, collected through the program were recycled as per the approved plan.

The breakdown of materials recovered from the province of British Columbia during 2023 included:

- 3,838 total mercury-containing vessels (there can be anywhere between 1 to 4 mercury vessels contained in each thermostat)
- 3,823 electronic thermostats
- 9.5 kg of mercury (calculated based on 2.5 grams of Hg per vessel) (not recycled)
- 3.8 kg of glass (calculated based on 1 gram of glass per vessel) (not recycled)

Thermostat Recovery Program 2023 Report to Director, Waste Management

- 67 kg of metals
- 194 kg of plastic (thermostat housing) (not recycled)
- 664 batteries

The recyclability of mercury-containing thermostats cannot be improved, nor can the reusability of these obsolete products. New electronic programmable thermostats are more eco-conscious as they do not contain mercury and demonstrate higher energy efficiency than its mechanical mercury-bearing predecessor. Furthermore, there are dangers associated with the reuse of mercury-containing thermostats due to incompatibility with some new HVAC systems. For this reason, responsibly recycling older thermostats and replacing them with newer electronic models continues to be the best practice to reduce environmental impacts in program operations.

TRP will continue to participate in ongoing discussions with recycling and waste processing facilities, as well as other stewardship organizations, in hopes to derive a joint solution to divert e-plastics from landfill. Investigations into potential solutions will consider all developments within the plastics market, along with any government developments directly affecting the Chinese National Sword Policy.

Efforts to continually reduce environmental impacts within the scope of the program have centered on improving the program's collection processes. To avoid collecting non-thermostat materials through the program, all of the TRP's collection pails are labeled with the program logo and branding, with warnings to restrict collections to intact thermostats only (as described in [Section 3](#)), and participants are routinely reminded to limit collections to thermostats and related materials. In addition, the TRP team sends a monthly "Unaccepted Collections Notice" via email to those participants that returned collection pails containing one or more item(s) that the TRP does not accept in our recovery stream (including thermometers, barometers, batteries, CFL bulbs, liquid/elemental mercury, etc.).

The Thermostat Recovery Program continues to explore additional practices to reduce environmental impacts to ensure the program delivers positive outcomes for the environment and British Columbia's citizens.

6. POLLUTION PREVENTION HIERARCHY AND PRODUCT / COMPONENT MANAGEMENT

As per the stewardship plan for thermostats, pollution prevention efforts have continued to focus on recycling, rather than reduction/redesign or reuse. The breakdown as to why recycling is the preferred management technique out of the four "Rs" is provided below.

Reduce/redesign: The main environmental concern with thermostats is the mercury contained in many older models. While many of these thermostats remain in use, the last known date of manufacture for these mercury-containing thermostats in Canada was 2008 and they are no longer sold in Canada. New thermostats have been redesigned to eliminate the mercury component and improve energy efficiency.

Reuse: The plan does not encourage the reuse of old thermostats collected through this program for the following reasons:

- Our primary goal is to collect old mercury-containing thermostats and ensure that the mercury and other components are properly recovered from the environment and managed responsibly, not to see them in continued use;

Thermostat Recovery Program 2023 Report to Director, Waste Management

- Old non-mercury-containing thermostats may not meet the technical/safety specifications of new HVAC systems and consume more energy than electronic programmable models.

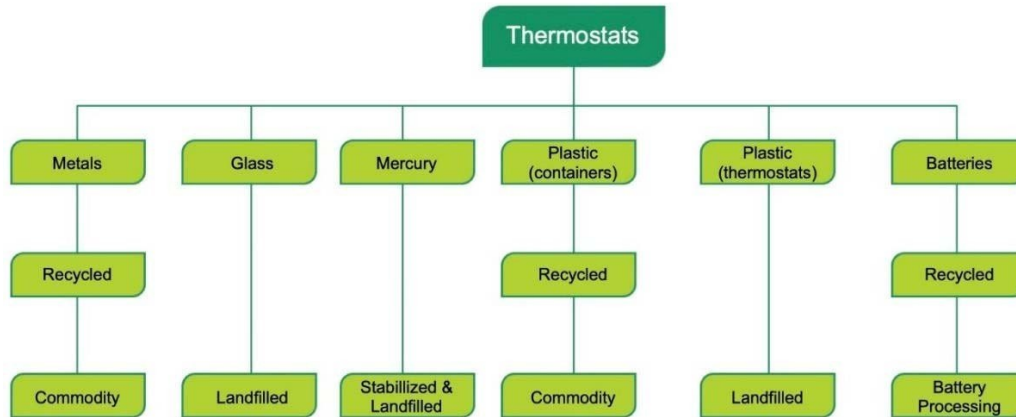
Recycle: As per the program plan, the thermostats recovered from the Province of British Columbia are counted, documented, dismantled, and recycled where possible. The thermostat components are handled as follows:

- The metals collected are a mix of iron, nickel and aluminum, all holding high reuse/recycling value. Metals collected are consolidated with like materials at the collection facility and sent to recycling within Canada.
- The glass vials containing the mercury are consolidated with others from Canada and shipped to Bethlehem Apparatus located in PA, USA, at least once per year, where the glass and mercury are separated.
 - The glass is crushed and sent to landfill due to quality impurities and low market demand.
 - The mercury undergoes a stabilizing treatment process, converting elemental mercury to mercury sulphide, rendering it safe for disposal in specially engineered landfills. Once the mercury is processed by Bethlehem, it is shipped back to Canada for Disposal at Stablex located in Quebec. The mercury recovered from thermostats and other manufactured products are no longer processed for reuse in new product manufacturing due to environmental concerns.
- The plastic components recovered through the program are deemed “e-waste plastics” and are comprised of mixed types. Until the end of 2017, when received by Aevitas Inc., the plastics were baled together and sent to be prepared for resale at one of the program’s downstream recycling processors, either Durham Shred and Recycle or West Coast Plastics. Since the 2018 ban on imported global waste plastics in China, no amount of plastics recovered through TRP were sent for recycling. This ban significantly limits the types of plastics accepted by recycling facilities, stripping e-waste plastics of economic viability. Therefore, until an appropriate alternative solution is made available, Aevitas, along with other waste processing facilities, have been disposing of collected e-plastics in landfill. TRP has touched base with Aevitas numerous times in 2023 inquiring about alternatives for the e-waste plastics.
- The plastic collection pails are made of high-density polyethylene (HDP). This material is an easily recyclable valuable product, which can be pelletized and reused as a feedstock for plastics manufacturing. Broken and damaged collection pails at the end of life are sent to RPM Environmental Inc. located in Burlington, ON for recycling.
- The batteries are sent to Port Colborne, ON for recycling.

TRP will continue to participate in ongoing discussions with recycling and waste processing facilities, as well as other stewardship organizations, in hopes to derive a joint solution to divert e-plastics from landfill. Investigations into potential solutions will consider developments within the plastics market. Recent conversations with Aevitas indicate that they continue pursuing a solution to the plastics.

The Thermostat Recovery Program products management is described in the following chart:

TRP Products Management Flow Chart



The following table describes the acceptable end fates for each of the components of a thermostat:

Component	Reuse	Recycle	Material or Energy Recovery	Landfill	Other
Plastics (thermostat housings)	X	Preferred	X	X	See comment below
Metals	X	Preferred	X	X	N/A
Mercury Vessels (glass)	X	Preferred	X	X	N/A
Mercury Vessels (mercury)	No	X	X	X	N/A

Greater than 99% of all collected metal components are recycled, and were managed in accordance with the program plan and principles of pollution prevention in 2023. Although collected, plastic components were not recycled due to changes in end-markets, solutions to rectify this issue continue to be pursued. HRAI will discuss material or energy recovery options for the e-plastic’s with Aevitas.

The following table describes the final disposition of the components of a thermostat:

Component	Processing Method	Downstream Process & Final Disposition
Plastics (thermostat housings)	The plastic from the thermostat housings are a mix of low grade plastic and not amenable to recycling and there are currently no end markets.	Landfill
Metals	The metals are a mix of iron, nickel and aluminum, all holding high reuse/recycling value. Metals collected are manually separated from the thermostat and consolidated with like materials at the collection facility (Aevitas) and sent to recycling within Canada.	Recycle – smelting
Mercury Vessels (glass) [±]	The glass is crushed and sent to landfill due to quality impurities and low market demand.	Landfill
Mercury Vessels (mercury) [±]	The mercury undergoes a stabilizing treatment process, converting elemental mercury to mercury sulphide, rendering it safe for disposal in specially engineered landfills. Once the mercury is processed by Bethlehem Apparatus located PA, USA, it is shipped back to Canada for disposal at Stablex located in	Landfill (after stabilization)

Thermostat Recovery Program 2023 Report to Director, Waste Management

Quebec. The mercury recovered from thermostats and other manufactured products are no longer processed for reuse in new product manufacturing due to environmental concerns.

± The glass vials containing the mercury are consolidated with others from Canada and shipped to Bethlehem Apparatus located in PA, USA, at least once per year, where the glass and mercury are separated.

The following table describes processing pathways and criteria used to assess product end fate by product component:

Nature of Processing	Component (% sold or transferred for processing)			Basis of evidence for product treatment
	Plastics	Metals	Hg Vessels (incl. glass)	
Transfer to direct processor (BC or ON)	0%	>99%	0%	<ul style="list-style-type: none"> • Due diligence process for supplier selection (incl. detailed qualification of downstream suppliers by Aevitas) • Detailed contracts with collection facility • Monthly reporting from collection facility • Site visit to review processes at local collection facility • Official shipping manifest with product weights • Certificate of Destruction/ Recycling provided by retort facility
Transfer to direct processor elsewhere in North America	0%	0%	0%	
Transfer to direct processor outside of North America	0%	0%	0%	
Multi-step processing (BC or ON)	0%	0%	0%	
Multi-step processing elsewhere in North America	0%	0%	100%	
Multi-step processing outside of North America	0%	0%	0%	

7. PRODUCT SOLD AND COLLECTED AND RECOVERY RATE

Mercury-containing thermostats are no longer sold into the Canadian market and with no sales to report, the amount of product sold is not currently tracked. With respect to newer programmable models, thermostat sales are neither tracked on a provincial, nor federal level, therefore insufficient data is available to report on the matter. Although thermostats can have a lifespan of 20-30 years, renovations can reduce this lifespan by roughly 7-10 years. This further challenges the process of determining any correlation between the amount of product sold and that recovered.

For the reasons stated above, the TRP does not use recovery rate as a metric for program performance, but rather measures the total amount of product collected against targets set in the approved program stewardship plan (see [Section 9](#)).

8. SUMMARY OF DEPOSITS, REFUNDS, REVENUES AND EXPENDITURES

As the Thermostat Recovery Program does not charge deposits, this section does not apply.

9. PLAN PERFORMANCE

Typically, the Thermostat Recovery Program measures performance and communication efforts for a given year against targets set out in the approved product stewardship plan for that calendar year. Since

Thermostat Recovery Program 2023 Report to Director, Waste Management

the most current approved stewardship plan for thermostats does not include targets for the 2023 reporting year, the TRP will not be reporting progress made towards approved targets.

9.1. Progress toward Collection Targets

The following table depicts program performance results during the period of January 1 to December 31, 2023, compared to results from the same period in 2022.

Metrics	Program Results		Percent Change from 2022
	2022	2023	
Collection Metrics			
Adjusted Total Mercury-Containing Thermostats	2,854	3,432	+ 20 %
Intact Hg Vessels	3,096	3,677	+ 19 %
Loose Hg Vessels	209	161	- 23 %
Electronic Thermostats	3,061	3,823	+ 25 %
Collection points	395	368	- 7 % [±]
Communication Metrics			
	2022	2023	Percent Change from 2022
Program Website Visits	3,696	3,338	-10%
Printed Brochures Distributed	227	71	-69%
Printed Drop-Off Posters Distributed	5	8	+ 60%
Industry-Facing Ads	4	21	+ 425%
[±] Difference in collection points between 2022 and 2023 is a result of database cleanup removing participants that were no longer active.			

Although all participating collection locations are instructed to return only intact thermostats, mercury vessels are occasionally returned as well. Using the industry-accepted standard of 1.4 switches per thermostat, the number of loose switches returned in 2023 is equivalent to roughly 115 thermostats (161 loose hg vessels/1.4 = 115). The adjusted total number of thermostats collected in 2023 is then 3,432. Continued efforts will be made in 2024 to increase program awareness and education to ensure participants understand and follow program instructions. Programmable electronic thermostats are becoming the standard across Canadian buildings, resulting in an anticipated decline in the number of mercury-containing thermostats available for collection with time.

Dedicated to continuous improvement, in 2023, the TRP endeavored to continue achieving successful performance outcomes and providing Canadians with an easy, safe and free solution for the collection and recycling of thermostats. In 2023, to achieve desired outcomes, the TRP performed a strategic review of the TRP's marketing and outreach initiatives, working with HRAI's Creative, Communications and Marketing Director.

The TRP will continue exploring new ways to improve program participation and engagement in 2024. Through ongoing efforts and improvements, HRAI is confident that the program will remain successful in the coming years.

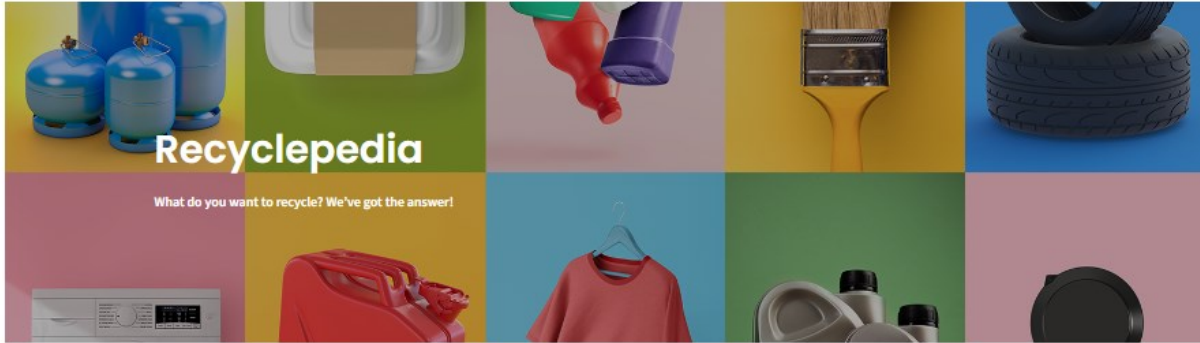
9.2. Amount Collected by Regional District

The following table demonstrates the number of thermostats collected in each regional district in 2023.

Region	Sum of Electronic	Sum of Mercury Thermostats
<i>Alberni–Clayoquot Regional District</i>	0	0
<i>Capital Regional District</i>	827	507
<i>Cariboo Regional District</i>	0	0
<i>Columbia–Shuswap Regional District</i>	0	0
<i>Comox Valley Regional District</i>	25	46
<i>Cowichan Valley Regional District</i>	0	28
<i>Fraser Valley Regional District</i>	14	69
<i>Metro Vancouver Regional District</i>	2652	2222
<i>Central Coast Regional District</i>	0	0
<i>Peace River Regional District</i>	29	38
<i>qathet (Powell River) Regional District</i>	16	19
<i>Bulkley–Nechako Regional District</i>	0	0
<i>Central Kootenay Regional District</i>	0	49
<i>Central Okanagan Regional District</i>	20	86
<i>East Kootenay Regional District</i>	1	32
<i>Fraser – Fort George Regional District</i>	0	27
<i>Kitimat–Stikine Regional District</i>	0	17
<i>Kootenay Boundary Regional District</i>	24	6
<i>Mount Waddington Regional District</i>	0	0
<i>Nanaimo Regional District</i>	0	0
<i>North Okanagan Regional District</i>	0	0
<i>Okanagan–Similkameen Regional District</i>	0	0
<i>North Coast (Queen Charlotte) Regional District</i>	0	0
<i>Squamish–Lillooet Regional District</i>	0	0
<i>Strathcona Regional District</i>	157	81
<i>Sunshine Coast Regional District</i>	51	27
<i>Thompson–Nicola Regional District</i>	1	75
<i>Unidentified Regional District</i>	6	103
Total	3823	3,432

APPENDIX A - MEDIA

RCBC Recyclepedia



What are you recycling?

Mercury Containing Thermostats

Where are you recycling?

Vancouver

Find Locations

Item not listed? Make a suggestion here

We didn't find any results for your search combination, try searching for a nearby community for additional options or contact the Recycling Council of BC for assistance.

Mercury Containing Thermostats











Thermostats including electrical, mechanical, and mercury-containing thermostats are collected through the Heating, Refrigeration and Air-Conditioning Institute of Canada (HRAI)'s province-wide [Thermostat Recovery Program \(TRP\)](#). They are accepted free-of-charge at TRP depots provided that they are fully intact.

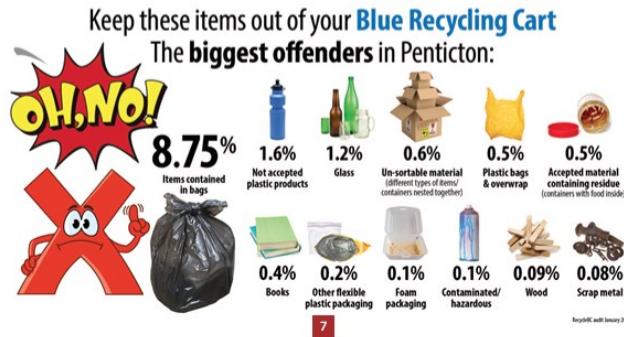
For areas without a permanent drop-off depot, a free mail-in option exists. For additional information on the program and to locate the nearest drop-off depot, please visit www.hrai.ca/trp or call the RCBC Recycling Hotline.



City of Penticton Collection Calendar

B.C. Product Stewardship Programs 2023-2024

PRODUCT	STEWARD	PROGRAM	For more details and depot locations
 <p>Paint and Household Hazardous Waste</p>		<p>Recycle leftover household paint, empty paint cans, and household hazardous waste including flammable liquids, pesticides, and gasoline at several locations in the province. Please ensure products are in their original containers, with intact labels and a tight seal.</p>	<p>Visit productcare.org/bc for a full list of accepted products and recycling locations, or call the Recycling Council of B.C. Hotline at 1-800-667-4321.</p>
 <p>Major Appliances</p>		<p>Responsibly recycle your old, major appliances including ovens, dishwashers, washers/dryers, range hoods, and more - including appliances with refrigerants like fridges, freezers, and air conditioners. Find a free, certified collection site near you plus a full list of accepted products at marbc.ca</p>	<p>For more details and depot locations: marbc.ca/collection-site-locator or 1-888-252-4621.</p>
 <p>Lights, Bulbs and Fixtures</p>		<p>Recycle your light bulbs and light fixtures at hundreds of recycling locations in the province. Common accepted products include CFLs, LEDs, fluorescent tubes, and fixtures like lamps, flashlights, string lights, chandeliers, and more.</p>	<p>Visit productcare.org/bclights for a full list of accepted products and recycling locations, or call the Recycling Council of B.C. Hotline at 1-800-667-4321.</p>
 <p>Thermostats</p>		<p>Bring your thermostat in for safe recycling and disposal to keep all its components, especially mercury, out of the waste stream. Includes all mercury-containing, electronic and mechanical thermostats.</p>	<p>To participate in the program or find Public Drop-Off locations near you, please visit hra1.ca/trp or contact the TRP team at 1-800-267-2331 x108 or 905-602-4710 or send an email to trp@hra1.ca</p>
 <p>Smoke or Carbon Monoxide Alarms</p>		<p>Bring your smoke or carbon monoxide alarms to your nearest recycling location for safe recycling.</p>	<p>Visit productcare.org/bcalarms for a full list of accepted products and recycling locations, or call the Recycling Council of B.C. Hotline at 1-800-667-4321.</p>



City of Mission Collection Calendar

Going to the Depot?

Here's How to Enhance the Experience

- **Make your trip worthwhile.** Adding to traffic and lineups to drop off one spent toaster and a light bulb is not a good idea.
- **Sort your load at home.** Sorting recyclables at the counter takes time and holds up other depot customers.
- **Follow depot staff's direction,** they are there to keep things running and safe.
- **Direct program-related questions to the City** (engineering@mission.ca or 604-820-3736).

Sorting Recyclables for Drop-off

- Sort your clean, dry, everyday recyclables into the following categories at home:
- **Paper products** (newspaper, flyers, magazines, office paper, envelopes & cardboard)
 - **Rigid retail containers** (soup & pet food cans, metal lids, plastic cups, tubs, pails & jugs, plastic clam shells, tin takeout trays)
 - **Retail container glass** (jam & pickle jars, marinade & ketchup bottles)
 - **Styrofoam™** (trays & boards, sorted into white and coloured) – no flexible foam or "peanuts"
 - **Flexible plastic packaging** (chip & dry pasta bags, pet food bags, candy wrappers, produce netting, Ziploc™ bags, and Saran™ wrap, shopping & bread bags, case lot overwrap)

Other Recyclables

For a list of other recyclables accepted at the Mission Recycling Depot or elsewhere, please consult the Guide on page 5 of this calendar.




McBride Recycling Round-Up Event

RECYCLING Round Up

Saturday September 23, 10 am - 2 pm

Steve Kolida Village Park & Playground

Main Street & 2nd Avenue, McBride



Items Accepted

- **Batteries** automotive & household
- **Tires** residential tires
- **Thermostats**
- **Small Appliances** vacuums, microwaves, blenders, portable fans
portable heaters, portable A/Cs, dehumidifiers, water coolers, trash compactors
- **Electronics** TVs, computers, musical instruments
- **Power Tools** drills, circular saws, electric sanders, band saws
- **Electric Outdoor Equipment** electric leaf blowers,
electric weed whackers, electric chainsaws, *NO GAS-POWERED ITEMS*



HPAC Magazine Ad (Industry Publication)

February, October and December 2023 Issues

NIBCO has appointed Steve Main the new chairman and CEO. Main has been with NIBCO since 1996 and has served as president and COO from 2006 to 2018 and president and CEO since 2018. He will now oversee the overall vision, mission, strategy and performance of the company. In addition, Ashley Martin has been promoted to president and COO. She joined the company in 2012 and has been executive vice president since 2021. Martin represents the fifth generation of family leadership since 1904. Rex Martin will assume the title of chairman emeritus, having served as chairman since 1995. Rex has been with the company for over 48 years and will continue to be an advisor.

Also, Dawn Bloch has been promoted from vice president, customer engagement, to chief people officer (CPO). Bloch is the first woman to be named to NIBCO's executive leadership team who is a nonfamily member. She joined the business in 2009 as a customer service representative.

dahl Valve Ltd. has appointed Jon Kronmeyer as president following the retirement of Don Watt. A seasoned executive with sales leadership and product development experience, Kronmeyer was most recently COO with Bjork Floors.

Rardon Supply has named Matt Golden as the new branch manager for their Belleville location. Golden first joined the company as a co-op student in the warehouse in 2002. Over the past 20 years he has expanded his industry knowledge and held many roles including inside sales, estimating and purchasing.

Richard Kutzner has joined COOL ESTATE as technical director, training and education. Kutzner brings over 35 years of industry expertise in residential and commercial HVAC, ductless systems, cold climate heat pumps, as well as controls. He'll be tasked with in-person training and education as well as national field service assistance.

Barclay Sales has added Darryl Morrow to its technical sales team. A journeyman with 30 years of experience in the HVAC profession, most recently on the distribution side, Morrow is now responsible for expanding Barclay's technical sales into Saskatchewan and Manitoba. Over the years he has developed a strong reputation among contractors, builders, and developers.

Cairiff North America has hired Tina Gulickson as Chief Operating Officer to take on a leadership role as Mark Olson, company CEO, has announced he will be stepping down. Bringing 20 years of experience in the plumbing and hydronic industries, Gulickson began in sales but moved to business development and leadership positions within Weil-McLain, then Bannaflores, most recently as general manager of the OEM division for North America.

Wolansky Canada has named Mark Evans as director of sales, planning HVAC in Western Canada. Most recently Evans was senior director of corporate development at Viaga. Prior to Viaga, Evans worked in the wholesale, agency and manufacturing sectors for companies including Danfoss and Wilo.

Smith Energy has announced Matthew Reid has joined the team as outside sales representative, based at the company's Richmond Hill, Ont. office. Most recently Reid was technical sales specialist for Equipco covering all of Ontario.

Bring your mercury or smart electronic thermostats in for SAFE DISPOSAL

1,775 Wholesaler & Contractor participants, and growing!

MORE INFO
hrai.ca/trp
1-800-263-7731
1-708-771-7313
trp@trp.ca

TRP Marketing Thermostat Recovery Program Website:



Industry

- Membership
- Training
- News & Events
- Refrigerant Management Canada
- Thermostat Recovery Program
 - About the Program
 - RAD
 - Facts & Info
 - Stewardship Plans & Approvals
 - Program Results
 - Program Facilitators
 - Participate
 - Register
 - Public Drop Off Locations
- Refrigerant Transition in Canada
- HVACR Quarterly Statistics
- HRM & OPH Quarterly Economic Review
- Rebates
- HRM's Climate Action Statement
- Budget Submission



The Thermostat Recovery Program (TRP) is a stewardship program focused on recovering and recycling thermostats that are no longer in use across Canada.

We accept mercury-containing, electronic and mechanical thermostats and ensure that all the components, especially the mercury, are kept out of the waste stream.

It is an easy, safe and FREE way to help reduce the human health and environmental threats posed by mercury. Register [below](#).

Does your thermostat contain mercury?

> Find out here: [RESPONSIBLE THERMOSTAT RECYCLING](#)

Contact the TRP Coordinator:

trp@trpa.ca | (905) 602-4710 | (905) 267-2231 ext58

Staff contacts:

[Nancy Larsen](#), Program Coordinator, Environmental Services
(905) 267-2231 ext40

[Kathleen O'Malley](#), Manager, Environmental Services
(905) 267-2231 ext40

TRP Promotional Brochures (PDF):

> [MAKE THE RIGHT SWITCH \(CONSUMER-FOCUS\)](#)

> [EASY, SAFE, FREE, THERMOSTAT RECYCLING \(INDUSTRY-FOCUS\)](#)

[Click here to learn about your options.](#)

Register

To become a TRP Collection Point, or to return your thermostat(s) on a one-time basis, for FREE!

[Public Drop Off Locations](#)

TRP Counter

Number of mercury vessels	Number of thermostats	Weight of mercury in kg
343,847	225,412	859.62

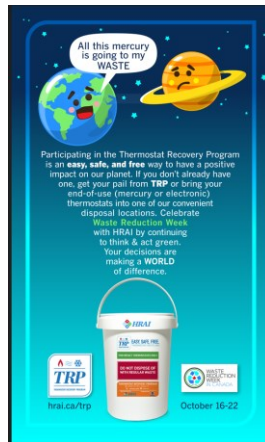
[Newsletter Sign up](#)

HRAI Newsletter Ads

Earth Day Ad April 2023



Waste Reduction Week
Oct 5, 12 and 19, 2023



Pail Sweep Campaign
November 2023 + Email blast sent to all TRP Participants on Nov 8/23



June 14, 2023

APPENDIX B – THIRD PARTY ASSURANCE

Independent practitioner’s reasonable assurance report on Heating, Refrigeration and Air Conditioning Institute of Canada’s Annual Report to the Director of Extended Producer Responsibility Programs at the Ministry of the Environment and Climate Change Strategy, Government of British Columbia

To the Management of Heating, Refrigeration and Air Conditioning Institute of Canada (“HRAI”)

We have undertaken a reasonable assurance engagement on the subject matter detailed in Appendix A as presented in HRAI’s Annual Report to the Director (the “Report”) of the British Columbia Ministry of Environment and Climate Change Strategy (the “Ministry”) as hosted on the HRAI’s website¹ for the year ended December 31, 2023.

Management’s responsibility

Management is responsible for the preparation of the subject matter in accordance with the sections 8(2)(b), 8(2)(d), and 8(2)(e) of the British Columbia Recycling Regulation 449/2004 (the “criteria”) detailed in Appendix A. Management is also responsible for such internal control as management determines necessary to enable the preparation of the subject matter that is free from material misstatement, whether due to fraud or error.

Our responsibility

Our responsibility is to express a reasonable assurance opinion on the subject matter based on the evidence we have obtained. We conducted our reasonable assurance engagement in accordance with the Canadian Standard on Assurance Engagements (CSAE) 3000, *Attestation Engagements Other than Audit or Reviews of Historical Financial Information*. This standard requires that we plan and perform this engagement to obtain reasonable assurance about whether the subject matter is free from material misstatement.

Reasonable assurance is a high level of assurance, but is not a guarantee that an engagement conducted in accordance with this standard will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the decisions of users of our report. The nature, timing and extent of procedures selected depends on our professional judgment, including an assessment of the risks of material misstatement, whether due to fraud or error, and involves obtaining evidence about the preparation of the subject matter in accordance with the applicable criteria.

Our reasonable assurance procedures included, but were not limited to the following:

- making enquiries to obtain an understanding of the overall governance and internal control environment and risk management processes relevant to the management and reporting of the Report;
- analytical reviews and trend analysis of reported data;
- testing the processes, documents and underlying data on a sample basis;

¹ The maintenance and integrity of the HRAI’s website (<https://www.hrai.ca/program-results-trp>) is the responsibility of HRAI; the work carried out by Grewal Guyatt LLP does not involve consideration of these matters and, accordingly, Grewal Guyatt LLP accepts no responsibility for any changes that may have occurred to the reported information or criteria since they were posted on the website.

- recalculating quantitative data on a sample basis as it pertains to the subject matter information; and
- evaluating the presentation and disclosure of the subject matter information in the Report.

We believe the evidence we obtained is sufficient and appropriate to provide a basis for our opinion.

Our independence and quality management

We have complied with the relevant rules of professional conduct/code of ethics applicable to the practice of public accounting and related to assurance engagements, issued by various professional accounting bodies, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

The firm applies Canadian Standard on Quality Management 1, *Quality Management for Firms that Perform Audits and Reviews of Financial Statements, or Other Assurance or Related Services Engagements*, which requires the firm to design, implement and operate a system of quality management, including policies or procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Opinion

In our opinion, HRAI's subject matter as presented in the Report for the year ended December 31, 2023 is prepared, in all material respects, in accordance with the applicable criteria.

Emphasis of matter

We draw your attention to Appendix B, which describes why certain items required by the Assurance Requirements have been excluded. Our opinion is not modified in respect of this matter.

Purpose and restriction of use

The subject matter has been prepared in accordance with the applicable criteria to report to the Ministry. As a result, the subject matter may not be suitable for another purpose. Our report is intended solely for HRAI.

We acknowledge the disclosure of our report, in full only, by HRAI at its discretion, to the Ministry without assuming or accepting any responsibility or liability to the Ministry or any other third party in respect of this report.



Grewal Guyatt LLP

Chartered Professional Accountants, Licensed Public Accountants

Richmond Hill, Ontario

June 14, 2024

Appendix A – Results and criteria

1. The location of collection facilities, and any changes in the number and location of collection facilities from the previous report as presented on page 3 of HRAI's 2023 Annual Report to the Director.

Result:

There is one main collection facility as of December 31, 2023.
Reference: Page 3 of HRAI's 2023 Annual Report to the Director.

Method of reporting:

- Reporting Period: January 1 to December 31, 2023.
- HRAI considers Aevitas Inc. to be the only Collection Facility, because "Collection Points" are more of a mechanism of recovery that increases access to the public similar to the function of a Canada Post or Courier outlet.
- The number of Collection Facilities is reported on the basis of the number of Collection Facilities who have a signed contract with HRAI to collect, process, ship, and report on collected program products during the reporting period.
- The changes in number and location of Collection Facilities are calculated by tracking the additions and removals of Collection Facilities throughout a given reporting year. This information is further compared with the equivalent data from the end of the prior year.

Definitions:

- "Program Products" are all products included in the program as listed in the revised product stewardship plan 2015-2020, Section 2.4.
- "Collection Facilities" are considered to be locations with a signed contract with HRAI for the purpose of collecting, processing, shipping, and reporting on Program Products at any point during the reporting year.
- "Collection Points" are mechanisms for collection. This term was new to the program as of the 2012 reporting year. In prior years, the collection points were considered the collection facilities. Collection Points may include the following types of businesses (also known as 'participants') and have either signed a formal document or had a verbal discussion outlining their agreement with the Agency to take part in the program:
 - Contractors
 - Wholesalers
 - Local or regional government recycling centers or transfer stations
 - Direct send-back

2. The description of how recovered product was managed in accordance with the pollution prevention hierarchy in accordance with 8(2)(d) of the Recycling Regulation as presented on pages 3, 11, 12, 13, and 14 of HRAI's 2023 Annual Report to the Director.

The descriptions of how components (i.e., plastic, metals, glass vials containing mercury) are processed, is presented in a list on pages 11-14 of the 2023 Annual Report for Aevitas Inc.

The acceptable end fates for each of the components of a thermostat is presented within the table on page 13 of the 2023 Annual Report.

Component	Reuse	Recycle	Energy recovery	Landfill	Other
Plastics	X	Preferred	X	X	See page 13
Metals	X	Preferred	X	X	NA
Mercury Vessels (glass)	X	Preferred	X	X	NA
Mercury Vessels (mercury)	No	X	X	X	NA

Reference: Pages 3, 11, 12, 13, and 14 of HRAI's 2023 Annual Report to the Director.

Processor due diligence:

- i. HRAI satisfies itself with the sufficiency of all downstream processors of Program Products, up to and including end of fate, based on an established due diligence process including qualification by primary processors and/or annual site visits.
- ii. The due diligence process is administered or overseen by HRAI and considers the qualifications and capabilities of the processors, in line with the goals of the Program as set out in the revised product stewardship plan 2015-2020.
- iii. If the due diligence process is administered by the processors (i.e., a primary processor assessing a secondary processor), the results of the due diligence are assessed by HRAI for sufficiency.
- iv. The rigour of the due diligence process is tailored using a risk-based approach to assess the likelihood that, and impact of, the associated Program Products/materials will enter a waste stream.
- v. Processors are responsible for designing and maintaining their own system of internal control over the Program Product reporting process, as well as assessing the system of internal control of the downstream processors as part of the selection and ongoing due diligence process.

Processor reporting:

- The Primary Processors are responsible for maintaining the records for Program Products processed, for each separately identifiable commodity of Program Products, and reporting the results, including those from downstream processors, up to and including end of fate, on a consistent and timely basis to HRAI. Reporting includes both quantitative and qualitative end of fate data for Program Products.

Method of reporting:

- Reporting Period: January 1 to December 31, 2023.
- Program Products collected are reported by end of fate both by commodity and by process on the Pollution Prevention Hierarchy:
 - Reuse: N/A – No Program Products are reused per the revised product stewardship plan 2015-2020.
 - Recycle: Products are reported by each separately identifiable end of fate commodity (e.g., metals, glass, etc.) either based on the number of units for the mercury vessels; or based on weight in kilograms for the plastics, metals, mercury and glass:
 - ✓ The weight in kilograms of glass is calculated by multiplying the total number of mercury vessels by the industry standard of 1 gram of glass per vessel;
 - ✓ The weight in kilograms of mercury is calculated by multiplying the total number of mercury vessels by the industry standard of 2.5 grams of mercury per vessel
 - Recovery: N/A – No Program Products are recovered.
 - Waste: In 2023, the plastics generated from the TRP thermostats were disposed of into landfills.

Definitions:

- The Pollution Prevention Hierarchy includes the following:
 - “Reuse” includes all Program Products that are refurbished or can be reused “as is” through either resale, return to inventory, or given away as a donation.
 - “Recycle” includes:
 - Any Program Product that cannot be Reused;
 - Any Program Product where the sales agreement strictly prohibits the reuse of that product or requires its destruction;
 - Any Program Product that is harvested for parts;
 - Any commodities that are captured from the recycling process.
 - “Energy Recovery” relates to processing activities after the recycling stage and includes any element of the Program Product that is harvested to generate energy.

○ “Waste” includes any products not captured in the three streams above.

- “End of fate” is defined as the final processed state of each commodity before entering a re-use stream or shipment to landfill/sequestration.

3. The total amount of the producer’s product sold and collected and the recovery rate as presented on pages 4, 10, 15, and 16 of HRAI’s 2023 Annual Report to the Director.

Total amount of producer’s product collected in 2023 is:

- Collected 3,432 mercury containing thermostats, 3,823 electronic thermostats, and 161 loose mercury vessels.
- Adjusted total: 2,705 mercury containing thermostats and 3,823 electronic thermostats, for a total of 7,255 collected.

Adjusted total mercury containing thermostats are estimated as follows:

Using the industry-accepted standard of 1.4 switches per thermostat, the number of loose switches returned in 2023 is equivalent to roughly 115 thermostats. The adjusted total number of thermostats collected in 2023 is then 3,432.

Reference: Pages 4, 10, 15, and 16 of HRAI’s 2023 Annual Report to the Director.

Method of reporting:

- Reporting Period: January 1 to December 31, 2023.
- Quantification of Product Collected is based on the number of Thermostats and Hg vessels reported by the Collection Facilities as having been received/collected and diverted during the reporting year.
- These amounts are monitored on a monthly basis through information collected that includes the number of thermostats and Hg vessels collected by geographic location.
- Although all participating collection points are encouraged to return only intact thermostats, loose vessels (which have been clipped out of thermostats) are occasionally returned as well. The equivalent number of thermostats is calculated by dividing the number of loose vessels by the industry-accepted standard of 1.4 vessels per thermostat (determined through averages provided by the industry and confirmed during a pilot study conducted by the Agency in 2006).
 - The “Adjusted total number of thermostats” collected is calculated by summing the total number of thermostats collected and the equivalent number of thermostats calculated above.
- Additional information is also collected for internal tracking purposes such as:
 - Weight of plastics and metals collected;
 - Brand of the thermostat collected; and
 - Details of the mechanism used for collection (e.g., name and location of the Collection Point/Participant).

Definitions:

- "Program Products" are all products included in the program as listed in the revised product stewardship plan 2015-2020, Section 2.4.
- "Product Collected" is the amount of all Program Products collected from sources known to be located within the province of BC that occurred through the Collection Facilities. The amount of Product Collected is reported as the total number of thermostats, adjusted total number of thermostats, total number of Mercury ("Hg") vessels, and number of loose Hg vessels received by the Collection Facilities during the reporting year.

4. The performance for the year in relation to targets in the approved stewardship plan under Section 8(2)(b), (d) and (e) in accordance with Section 8(2)(g) of the Recycling Regulation are not presented in HRAI's 2022 Annual Report to the Director.

Result:

HRAI has not reported its performance for the year in relation to approved targets in their approved stewardship plans under 8(2)(b), (d) and (e) in accordance with 8(2)(g) of the Recycling Regulation for the year ended December 31, 2023 as HRAI is not required to report this to the Director as there are no targets set in the approved stewardship plan for these sections applicable to the reporting year.

Appendix B– Exclusions

HRAI has not reported the recovery rate for the year in accordance with 8(2)(e) of the Recycling Regulations for the year ended December 31, 2023 as the approved stewardship plan does not outline the requirement to report recovery rates. If the stewardship program does not report a recovery rate in the approved plan, assurance for producers' product sold data is not required as outlined in the Assurance Requirements.

HRAI has not reported its performance for the year in relation to targets under 8(2)(b) and (d) in accordance with 8(2)(g) of the Recycling Regulation for the year ended December 31, 2023 as HRAI is not required to report this to the Director as there are no targets set in the revised stewardship plan for these sections applicable to the reporting year.