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call2recycle® Recharging the planet. Recycling your batteries.

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November 30, 2009

The Honourable Barry Penner
Minister of the Environment
P.O. Box 9047
STN PROV GOVT
Victoria, British Columbia
V8W 9E2

Dear Minister Penner,

On behalf of battery and cell phone stewards represented by the Rechargeable Battery Recycling Corporation of Canada's ("RBRCC") Call2Recycle® program, we are pleased to submit a collection and recycling program to meet our obligations in response to the December 2008 amendment to the British Columbia Recycling Regulation of October 7, 2004, adding primary and rechargeable batteries, and cell phones to the regulation's waste management requirements.

This plan draws upon RBRCC's 12+ years of experience in British Columbia in promoting recycling, collecting batteries through our 1200+ sites throughout the province, and ensuring tens of thousands of tonnes of batteries are properly disposed at end of life. This plan culminates almost one year of work of development, seeking support of industry, input from a broad range of stakeholders and drawing upon the "best practices" of battery and electronics recycling programs from around the world. We have worked closely with your staff to ensure that this plan has been thoroughly designed, thoughtfully crafted and with ambitious goals.

We are prepared to be fully operational under the framework of this plan by July 1, 2010 as the British Columbia regulations prescribe. We urge your quick review and approval so we can put the necessary pieces into place to ensure a successful launch.

Please do not hesitate to contact me if you have any questions or comments.

Regards,

Carl E. Smith, CEO / President
Rechargeable Battery Recycling Corporation of Canada

MINISTRY OF ENVIRONMENT
CORRESPONDENCE UNIT
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Cc: David Lawes, MOE
Teresa Conner, MOE

P.O. Box 236 Station E Toronto, ON M6H 4E2 T. 1.888.224.9764 F. 1.888.902.7272 www.call2recycle.org

call2recycle®

An All-Battery and Mobile Phone Collection and Recycling Plan for British Columbia

Submitted to the Ministry of the Environment by:
Rechargeable Battery Recycling Corporation of Canada (RBRCC)

December 1, 2009

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APPENDICES (CONTINUED)

PART A – STEWARDSHIP PLAN OUTLINE

1. EXECUTIVE SUMMARY

This stewardship plan has been developed by the Rechargeable Battery Recycling Corporation ("RBRC") and the Rechargeable Battery Recycling Corporation of Canada ("RBRCC") in response to the December 2008 amendment to the British Columbia Recycling Regulation of October 7, 2004, adding primary and rechargeable batteries to waste management. A stewardship plan is required for primary and rechargeable battery producers (manufacturers, distributors, importers) to show responsibility for the life-cycle management of their products.

RBRCC has been appointed as the agency to meet the stewardship obligations for battery manufacturers, manufacturers whose products contain batteries, including cell / mobile phones, and certain distributors and retailers of products as may be appropriate. Under this appointment, RBRCC's Call2Recycle® program is charged with collecting dry cell batteries under 5 kilograms and cell / mobile phones.

This plan was developed in collaboration with the battery manufacturing and retail industries, local government representatives, non-profit and environmental groups, other stakeholders and the general public. This plan is also based on meeting the requirements of the Regulation, experience gained in other jurisdictions and a desire for harmonisation with similar programs in other Canadian and U.S. jurisdictions.

In addition, RBRCC accepted and responded to written comments submitted by October 31, 2009, and held public consultations in 3 cities in the Province:

Monday October 5, 2009 – Vancouver***
Time: 1:30 – 3:30 pm
Location: The Coast Vancouver Airport Hotel
1041 SW Marine Drive
Vancouver, BC V6P 6L6
*** Webcast was also available for those unable to travel to any of the meeting locations listed

Tuesday October 6, 2009 - Nanaimo
Time: 10:30 am – 12:30 pm
Location: The Coast Bastion Inn
11 Bastion Street
Nanaimo, BC V9R 6E4

Wednesday October 7, 2009 – Kelowna
Time: 10:30 am – 12:30 pm
Location: Delta Grand Okanagan
1310 Water Street
Kelowna, BC V1Y 9P3

The proposed plan has been available for the general public and other interested stakeholders at www.call2recycle.ca/bcstewardship.

The results of the consultations, as well as responses to all written input are available to review in *Appendix 1.1* of this document.

Main Program Elements

Based on this collective input, the program will be developed as follows:

1. Convenient Collection Systems

Actual collection points and methods will be determined through assessment of such matters as:

- proximity to population
- cost-effectiveness
- environmental health and safety
- ease of access
- facilities available

Collection systems will be designed with user convenience and flexibility in mind.

Major collection methods expected to be used include:

- The Call2Recycle® program offers battery and cell phone recycling plans for retailers, communities, public agencies, and businesses completely free of charge.

- Call2Recycle® provides all collection containers and collateral materials, and pays all shipping and recycling costs, so there is ***no cost to the public to participate.***

- Recycling Council of British Columbia (RCBC) and the RBRCC have partnered to provide an online resource for rechargeable battery recycling facts and collection locations.

2. *Processing and Recycling*

- The program will not ship any used batteries or cell phones to a processor that has not been qualified by Call2Recycle®. Work to qualify potential processors by Call2Recycle® has not yet been completed due to disruptions at a potential processing facility. Nonetheless, processors will be selected through a competitive process that will require compliance with applicable environmental, health and safety and transportation regulations including (but not limited to) the following:
    - Basel Action Network (BAN) qualification and ISO certification
    - Final destination receipt and disposal documentation/certification, downstream processing material management; and residual material management and residual waste management.
    - Recycling processor standards as adopted by the Electronic Stewardship Association of British Columbia (ESABC)
- Retailers, businesses, communities and public agencies will send the collected batteries and cell phones to a recycling facility for processing. Participation as a collection location is purely voluntary. A thermal recovery process will reclaim the metals (nickel, iron, cadmium, lead, and cobalt) from the batteries and prepare them for use in new products such as new batteries and stainless steel. Cell phones will be refurbished and resold when possible with a portion of the proceeds received from the resale of phones benefits select charities. No battery or cell phone waste will be disposed outside of North America.

  Depending on the outcome of pending discussions with the Ministry of Environment over permits for collection locations, the breadth of sites available to the public may be significantly affected.

3. *Public Awareness and Education*

The public awareness program will include all identified audiences with messages that, among other topics, will cover:

- The importance of battery collection and recycling
- Identification of materials covered by the program
- Where to take materials
- Where to get additional information
- Disposition of recycled material

Call2Recycle® conducts a national public education campaign to generate awareness and enlist support of the Call2Recycle® program. Through public service announcements, national advertising, and tradeshows, Call2Recycle®'s message reaches a diverse audience.

4. *Accountability and Transparency*

RBRCC is a non-profit, public service organization dedicated to rechargeable battery recycling in Canada. It is a wholly owned subsidiary of the Rechargeable Battery Recycling Corporation (RBRC). RBRC's financial statements are audited by an independent CPA firm annually that fees collected have been applied to recycling and public education program costs in both the USA and Canada.

RBRCC long has employed, and as part of the RBRCC plan in British Columbia will continue to employ, several different audit procedures to assure compliance with required laws and regulations and general efficiency, including:

- Compliance with all local, provincial and federal regulatory agencies
- Independent 3rd party verification of program accomplishments
- Periodic environmental audits of its recycling facilities
- Certificates of recycling to program participants requiring documentation
- Basel Action Network (BAN) qualification for all processors of batteries

5. *Financing Mechanism*

The Call2Recycle® program has been financed by rechargeable battery manufacturers and product manufactures (whose products are powered by rechargeable batteries for approximately a dozen years. A licensee fee is assessed for units and weights sold into North America. In British Columbia, financial support also will be provided by primary battery manufacturers using a cost plus reimbursement budget allocated to each manufacturer based on its market share. Over time, as more data and collection experience is collected, Call2Recycle® will consider transitioning to a charge per unit sold in the province. However, this will not occur during the first two years of operation in the province.

This plan does not require or speak to any charges that a retailer may or may not choose to impose on consumers to supplement the price of its products. In other words, there is no environmental handling fee required, proposed or recommended in this plan. Participation in this plan is free and voluntary to those collecting and returning batteries.

2.0 PROGRAM PRINCIPLES

A stewardship program will be introduced which will:

- Be consistent with the Canadian Council of Ministers of the Environment Canada-Wide Principles for Product Stewardship (CCME Principles) including harmonisation with other Canadian provinces. (www.ccme.ca/assets/pdf/eps_principles_e.pdf)
- Be consistent with British Columbia stewardship principles as defined in the Ministry of Environment Business Plan, the Recycling Regulation and the Recycling Regulation Guide

- Provide a level playing field and, in the longer term, provide the necessary research and development process to explore and define how environmentally responsible producers might be rewarded in the market place
- Achieve a high level of compliance and minimize the potential for free-riding product manufacturers
- Ensure the program is delivered with the lowest possible cost while achieving maximum environmental efficiency
- Ensure materials are processed and recycled in a responsible manner that safeguards the environment and worker health & safety as well as preventing illegal export to developing countries
- Ensure the program reflects a shared responsibility model with appropriate roles for the provincial government, local government, consumers, industry, and other stakeholders
- Ensure the program provides adequate coverage to all areas of the province including rural areas
- Strive for continuous improvement in environmental and economic performance

3.0 ORGANIZATION STRUCTURE AND MANAGEMENT

RBRCC is a not-for-profit corporation organized under Ontario law. It has operated the Call2Recycle® program in British Columbia since 1997. The Call2Recycle® program has collected used rechargeable batteries and used cell phones. With the approval of this plan in British Columbia, the Call2Recycle® program in the Province will be expanded to also include used primary batteries.

RBRCC operates under the direction of a Board of Directors. With the expansion of the Call2Recycle® in several Provinces to cover primary batteries, it has established an *Expanded Program Operating Committee* to supervise those programs. This *EPOC* includes the President of RBRCC and representatives of rechargeable battery manufacturers, rechargeable product manufacturers, nonrechargeable battery manufacturers, and selected outside members based on expertise and experience.

This *EPOC* also oversees the operations of all-battery collection and recycling programs initiated elsewhere in Canada and serves as a mechanism to strive for hamonisation across programs. Harmonisation will help to keep collection and processing costs down, while enabling clear and compelling communications to all stakeholders.

3.1 Management and Administration

RBRCC is responsible for the management and administration of the program. This includes, but is not limited to, the following tasks:

- Management of the public consultation process required for the stewardship plan
- Identification, registration, and auditing of obligated stewards
- Collection and disbursement of fees through a process which ensures confidentiality of data

- Management of program communications
- An interface for the public and with parties contracted under the program
- Preparing and distribution of an annual report
- Defining and meeting the performance management targets for the program, including the plan for continuous improvement
- Overall day-to-day management of the program, including liaison with other stakeholders and the British Columbia provincial government
- Ensuring compliance with all applicable federal, provincial and municipal requirements
- Management of contracts with the collection, sorting, processing and recycling service provider(s) and the audit functions
- Setting and adhering to operating budgets

4.0 PUBLIC EDUCATION AND AWARENESS

Call2Recycle® has an extensive public education program designed to both encourage all British Columbians to recycle their used batteries and inform them how they can participate in our recycling program. This will provide the foundation for the promotion, education and awareness activities of the Call2Recycle® program in British Columbia.

Batteries are commonly used at home, work and play. Therefore, all aspects of BC society are considered part of the communication outreach strategy for the existing and expanded Call2Recycle® program.

Building on our existing program's dynamics, our target groups will be categorized along the following dimensions:

- Program licensees (the approximately 175 companies that currently fund the RBRCC) and product stewards (6 primary battery companies that have committed to date to participate in this program).
- Collection sites (retail, community, public agency and business participants).
- Battery users (residents, business, community locations such as schools).
- Media (industry and consumer).

In 2009, Call2Recycle® will invest approximately $100,000 for BC outreach and promotion activities. Based on anticipated 2010 collections of 251,000 kilograms, RBRCC anticipates the promotion and education budget to be $200,000.

At the core of the Call2Recycle® public education program is the focus on information accessibility. This is accomplished through both electronic services and staff availability.

RBRCC maintains (and will continue to maintain) two websites (www.call2recycle.ca; www.appelarecycler.ca; *Appendix 2*) and two toll-free information lines: 877-2-RECYCLE (recorded) and 888-224-9764 (staff monitored). The websites provide comprehensive program information of relevance to all interests/support groups: retail, municipality, public agency, business, consumer, and media. Program participants (both existing and potential) as well as consumers can access information about the location

of nearby retail collection sites, extensive details on the operational dynamics of the Call2Recycle® program as well as sign-up guides for retailers/municipalities/public agencies and businesses. These guides provide a registration application and detail recycling guidelines, including storage, safety, packing and shipping including necessary documentation for non- Call2Recycle® containers (*Appendix 3*). Program participants can also download support materials such as web banners (*Appendix 4*), signage, and other communication support materials from Call2Recycle®'s website. Upon approval of the Call2Recycle® program in the Province, BC-specific information will be added to these information sources.

In addition to the information provided on Call2Recycle®'s website, awareness of the Call2Recycle® "all battery" program will be promoted in many ways and through a variety of mediums.

For years, Call2Recycle® has maintained and increased involvement by program participants, and this effort will continue. Support initiatives will continue to involve direct phone calls, postcard mailings and updates on collection results, all designed to inform and remind existing collection sites of their vital roles. In-store/organization signage is and will continue to be provided with collection box shipments (*Appendix 5*). Upon approval of the Call2Recycle® "all battery" program, this signage will be updated to promote an all battery collection and acknowledge BC's leadership role in this initiative.

Call2Recycle® purchases advertising space in select publications such as *Harrowsmith, Municipal World, Solid Waste & Recycling, Hazardous Materials Management, PhotoLife* and *Canadian Home Workshop/Mon Chalet,* and this will continue upon approval of the Call2Recycle® "all battery" program. Examples of recent advertising outreach may be found in *Appendix 6.* The directness of our communication message will be even more pronounced once Call2Recycle® expands to all battery recycling program.

Supplementing purchased advertising will be the distribution and airing of a series of radio and television Public Service Announcements (PSAs) encouraging battery recycling (*Appendix 7*). RBRCC will cooperate with the Ministry of Environment in preparing new PSAs upon approval of the Call2Recycle® "all battery" program.

Presence at targeted consumer and trade shows are additional components of Call2Recycle®'s outreach campaign. In 2008/2009, Call2Recycle® has exhibited at *Canada Blooms, Federation of Canadian Municipalities, Recycling Council of British Columbia Conference*, and this will continue. At these shows, Call2Recycle® answers inquiries and provides handout materials to support awareness and drive program participation. In addition, Call2Recycle® has established a partnership with home improvement expert Shell Busey and his *HouseSmart Referral Network* to promote battery recycling through radio, print, electronic media and appearance schedules. A series of "how to" info-videos also have been developed, tied in with Call2Recycle's battery recycling for distribution electronically and in Public Service Announcements (*Appendix 8*).

Call2Recycle® expects to continue for at least the near future as a prime sponsor of the *Old Timers' Hockey Tour* to outreach in communities across British Columbia and Canada. During winter 2009, Call2Recycle®'s tour sponsorship involved specific events in 8 cities in British Columbia (Fort St. John, Kamloops, Kelowna, Nanaimo, Penticton, Prince George, Vancouver and Victoria). Call2Recycle®'s in-game presence is significant as evidenced through postcard handouts, PSA airings, arena announcements and interviews, rink board advertising, program advertising and the sponsorship of the *Hockey Tykes* (*Appendix 9*).

The inclusion of primary batteries in our already well-established battery recycling program provides an excellent opportunity to improve the simplicity of our recycling message and program, streamlining the communication from a "rechargeable batteries" focus to "recycle batteries". Our already extensive roster of communication vehicles and forums will be able to incorporate this streamlined and heightened message right from the program's outset, enabling us to invigorate our collection partners to deliver exponential program growth and collection results.

The specific communication outreach objectives and strategies by target group are and will continue to be as follows:

i. *Program Licensees / Product Stewards*

Objectives

- To encourage RBRCC Licensees / Stewards to inform their sales base and target groups to recycle the battery post use and how this can be done.
- To involve RBRCC Licensees / Stewards in our recycling program at their place of business.

Strategies

- RBRCC Licensees generally must include the RBRCC Recycling Seal on their products within 6 months of program sign-up and will be encouraged to include the expansion of the program in BC in their promotional activities and advertising. RBRCC Stewards will similarly be urged to promote their participation in this program in BC within 6 months of program introduction.
- Specific section on websites: www.call2recycle.ca developed for Licensee training and program information.
- Toll-free information line (1-888-224-9764) to access support staff for inquiries and supply requirements/replenishment.
- Continued issuance of annual report, as well as yearly update reviews with RBRCC Licensees and product stewards regarding recycling performance and program outreach advances.
- RBRCC to host industry training meeting concerning the expansion of the Call2Recycle® program, key participation requirements and in-house participation

- Individual phone calls to RBRCC Licensees/Key Contact by Company within 2 months of program implementation to reinforce program requirements and encourage in-house participation.
- All battery program successes will be highlighted in Call2Recycle®'s Quarterly e-newsletter distributed to Licensees and program participants.

ii. *Collection Sites*

Objectives

- To inform existing Call2Recycle® collection sites about the expansion of the program, and reinforce their roles and responsibilities within the program
- To secure additional collection sites within retail, business, municipality, public agency, and community locations

Strategies

- Detailed instructions are provided in the sign-up guide advising of overall Call2Recycle® program and the steps involved in collecting and shipping Call2Recycle® containers for recycling
- Specific section on websites: www.call2recycle.ca developed for collection site training and program information
- Toll-free information line (1-888-224-9764) to access support staff for inquiries and supply requirements/replenishment
- Series of correspondence and phone calls to existing Call2Recycle® sites (1150+) to inform and remind them of their program participation and responsibilities (*Appendix 10*)
- Re-designed Call2Recycle® collection containers to accommodate and inform about expanded battery chemistry collection
- Adjustments to existing sign-up guides to reflect expanded chemistry
- Training video development for participants explaining program dynamics and outreach requirements
- Distribution of posters in collection containers for use in-store/at work to promote recycling program and participation details
- Presence at trade shows via presentation as well as exhibits to announce expansion and encourage added participation
- Semi-annual updates on individual site location collection results, including suggestions for further collection gains
- Advertising in select trade publications (retail, business, public agencies) to build awareness and participation
- Dedicated sections on www.call2recycle.ca for program information and training as well as availability of pre-developed communications materials that can be customized for individual needs
- Ongoing phone calls and postcard mailings to program participants to confirm program delivery and participation

- All battery program successes will be highlighted in Call2Recycle® Quarterly e-newsletter distributed to program participants.
- Development and implementation of co-promotion opportunities with collection partners to promote their involvement and the availability of battery recycling at their site.

iii. *Battery and Mobile Phone Users*

Objectives

- To inform and encourage all battery and cell phone users to recycle their used product

Strategies

- Licensee/steward-developed communication with product sale explaining the need to recycle their battery post-use (*Appendix 12*)
- Use of www.call2recycle.ca including a Postal Code-driven locator to inform of nearby collection drop-off locations
- Availability of bilingual toll-free 1-877-2-RECYCLE to inform of participating retail drop-off locations
- Articles and ongoing press releases advising of specific collection initiatives and events as well as the "for more information" vehicles: www.call2recycle.ca/,www.appelarecycler.ca and 1-877-2-RECYCLE
- Development and implementation of location-specific and provincial events (e.g. *Battery Recycling Week*) to encourage battery "round-ups" and ongoing participation. At the centerpiece of these events will be the Call2Recycle® Mobile Educational Unit – an interactive education and entertainment vehicle used to raise awareness about the importance and ease of battery recycling.
- Release of Public Service Announcements (PSAs) and targeted advertising campaigns to inform and encourage battery recycling
- Partnership with *Old Timers' Hockey* and *Kids Help Phone*, specific events and BC-specific tours to highlight battery recycling

iv. Media

Objectives

- To raise awareness of the dynamics of our collection and recycling program for used batteries and cell phones

Strategies

- Monthly press releases advising of initiatives and recycling successes
- Distribution of contributed articles for community newspapers

- Dedicated media newsroom on www.call2recycle.ca featuring background information, photos and other relevant support materials to assist in media coverage
- Development of newsworthy location-specific and provincial events/ announcements
- Leverage social media (e.g. Facebook) outlets to educate and promote program events and support.
- All battery program launch media event to announce program expansion

Program Support Vehicles/Tactics

In addition to the specifics identified above, *Appendix 13* provides samples of existing Call2Recycle® initiatives that have been used to communicate and support our collection program. Building on 12-years of BC and Canadian experience, these recognized examples of comprehensive marketing campaigns, involving both grassroots and consumer-oriented efforts, will be the foundation of the expansion of our all battery recycling focus. RBRCC and Call2Recycle® look forward to working with the BC Ministry of Environment to further develop these materials and take advantage of joint communication opportunities.

4.6 EVALUATION

The program will periodically evaluate public awareness of the program and report on its results. RBRCC uses the Call2Recycle® brand as the primary means to communicate with its stakeholders. In this regard, RBRCC periodically measures the awareness of this brand and its ability to communicate appropriate behaviors and actions. Baseline data was compiled in 2009 and will update annually to gauge increases in awareness.

Call2Recycle® also routinely assesses the accessibility of its collection sites, which is a critical dimension in maximizing collection. By comparing collection sites with demographics of the British Columbia population, Call2Recycle® can identify underserved areas and populations. In this regard, while Call2Recycle®'s current 1150 collection locations serve as an effective foundation for this program, Call2Recycle® anticipates significant growth in sites, particularly during the first few years of implementation of an all-battery plan.

5.0 COLLECTION, PROCESSING AND RECYCLING

Retailers, businesses, communities and public agencies send the collected batteries and cell phones to a recycling facility for processing. A thermal recovery process reclaims the metals (nickel, iron, cadmium, lead, and cobalt) from the batteries and prepares them for use in new products such as new batteries and stainless steel. Cell phones are refurbished and resold when possible. All rechargeable batteries from cell phones are recycled. A portion of the proceeds received from the resale of phones benefits selected charities.

5.1 Collection

The Call2Recycle® BC Plan will build upon and expand Call2Recycle®'s existing 1,150+ collection locations. These and future sites implement and will implement one or more of the following programs, all of which impose no charges to the collection site participant or used battery generators:

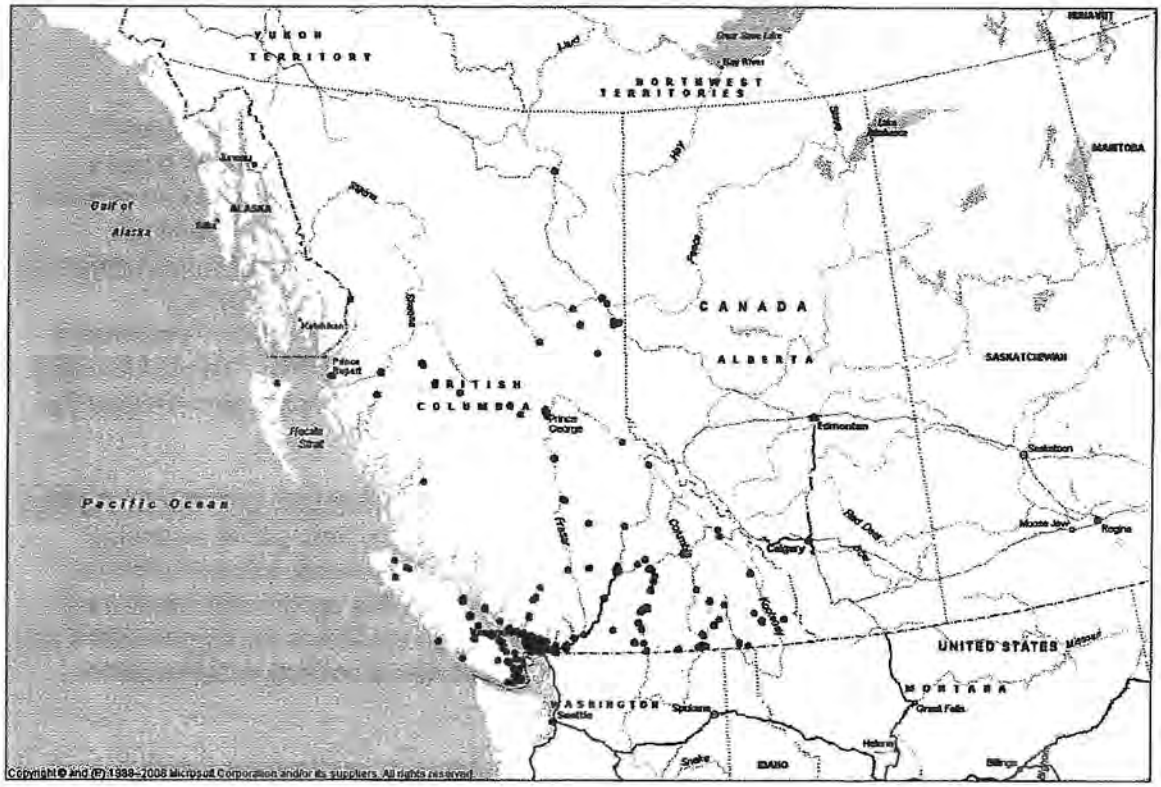
- *Retail Recycling Plan*: This program, a principal focus of the Call2Recycle® education program, aims at reaching consumers through retailers who sell batteries and battery-powered products. Participating retailers who serve British Columbia include Battery Experts, Canadian Tire, Future Shop, The Home Depot, London Drugs, Makita Factory Service Centers, Personal Edge/Centre de Rasoir, and The Source by Circuit City, Sears, Sony Style and Zellers. In addition to these national retail chains, however, the Call2Recycle® program is available to independent retail stores and regional retail chains. The full listing of BC retail sites that have signed up with the Call2Recycle® program are listed in *Appendix 14.*

- *Community & Public Agency Recycling Plan*: The Community and Public Agency Recycling Plan are targeted to municipalities, communities, public agencies (such as hospitals, police and fire departments), institutions and government agencies. The 147 BC sites already participating in this program are listed in *Appendix 15.* Included among the many collection initiatives for communities and public agencies are curbside collection, special waste collection events and household recycling centre collection.

- *Business Recycling Plan:* The Business Recycling Plan helps structure and manages the collection of qualified non-household batteries in the workplace, including bar code readers, laptop computers, two-way radios, cordless power tools, portable printers and PDAs. Approximately 80 businesses in BC are currently participating in the Call2Recycle® program. (*Appendix 16*).

The scope of collection locations indicated below may be significantly affected by the Ministry of the Environment's ultimate interpretation of what constitutes a hazardous waste collection site.

Map of British Columbia Collection Sites (As of September 1, 2009)



The Call2Recycle® British Columbia plan will expand this existing collection base using both RBRCC's existing resources and the additional contacts that will arise by virtue of its new support from non-rechargeable battery stewards. Participating as a collection location is purely voluntary for all organizations and companies. It is important to note that RBRCC operates in both official languages, with all-inclusive support from customer service to the full array of communication and support material.

The expansion of British Columbia's e-waste collection program also should contribute to increased battery collection locations by RBRCC in the province. RBRCC has well established working partnership with e-waste recyclers across the province, from which it already accepts rechargeable batteries through the Call2Recycle® program. This relationship will be further intensified to ensure that all batteries collected through e-waste initiatives are channeled in the Call2Recycle® program for recycling. Any e-waste depots or other battery collection and recycling processors who are not Call2Recycle® participants / partners will be asked to provide their collection data for inclusion in RBRCC's annual report of overall battery collection results in British Columbia.

To become a collection site, interested program participants are provided instructions and required to complete a sign-up application form *(Appendix 17).* Upon completion of the application, each new participant is then assigned a unique identification number. These numbers, like those assigned to existing participants ('sites"), allow tracking of all materials assigned and returned by the site. The site will then receive collection boxes (including plastic bags in which to place the individual battery to ensure safe storage and shipping as well as the "site I.D." marked on the box along with a pre-paid/pre-addressed return label), posters and safety/handling instructions to begin their collection initiative (*Appendix 18*).

The collection containers, made of corrugated cardboard with 92% post-consumer / 8% pre-consumer recycled content, are currently and will continue to be available in two sizes: one capable of holding approximately 9 kilograms of batteries (primarily used for collection at retail) and the other capable of holding approximately 18 kilograms (primarily used with higher quantity generators such as municipalities and business). These materials, along with transportation and recycling services, are and will be provided free-of-charge.

Larger quantity generators also have and will continue to have the option to utilize their own shipping containers, utilizing pre-approved labeling *(Appendix 19)* and adhering to the same preparation requirements (i.e. use of plastic bags to contain each collected battery) as per the Call2Recycle® collection containers. Bulk containers are preferred by Call2Recycle®as a more cost-effective means of collection, sorting and transportation. For those Call2Recycle® municipal collection locations that generate at least 150 kilograms of batteries per shipment, RBRCC will negotiate a fee to support the municipalities' costs for sorting, packaging and handling material.

Adherence to transportation and safety guidelines for battery collection is an ongoing priority within the Call2Recycle® program. All personnel handling Call2Recycle® collection containers must be instructed to read the preparation and shipping instructions for proper battery collection *(Appendix 20)* as well as watch Call2Recycle®'s safety training video. This video can be viewed online at http://www.rbrc.org/safety/safety_video.html.

When a used battery is turned in for recycling, each battery is to be placed and sealed in an individual plastic bag provided by Call2Recycle®. Bags are used to comply with Federal transport laws in Canada which require that certain types of primary and rechargeable batteries be insulated from possible electrical short circuit during transport (excerpts from regulations of relevance include: *the cells are separated to prevent short circuits*; *These dangerous goods may be handled, offered for transport or transported under this shipping name if the dangerous goods are (a) protected from short circuits. . . .* See *Appendix 21*). If bags are not available, Call2Recycle® also allows the use of non-conductive electrical tape to cover the battery terminals.

Once the collection container is filled and adherence to the "one battery – one bag" preparation standard is confirmed, the assigned person responsible for the Call2Recycle® program at the collection site must write his/her address on the shipping

label and securely seal the box when full. He or she must then call Purolator Canada, Call2Recycle®'s shipping service, or just include in his/her outgoing Purolator pick-up services. The pre-paid, pre-addressed container is then scanned by Purolator and, as of the time of this submittal, delivered to Newalta (Fort Erie, ON) where the content of the containers are sorted according to battery chemistry, weights recorded and readied for shipping to the designated-according-to-chemistry recycling processor. Newalta is assigned the management of shipping documentation and any manifesting of shipments to the final recycling destination. This destination may change depending on the outcome of identifying and selecting a processor and sorting capability.

The current Call2Recycle® program operates, and will operate, in accordance with intra- and inter-provincial shipping and transportation approvals provided by Transport Canada, the BC Ministry of Environment and all other provincial environment and transportation ministry approvals (*Appendix 22*). All shipments that are transported internationally are manifested in compliance with the Basel Convention and ISO standards (*Appendix 23*).

5.2 Processing and Recycling

The constituents of all of the used batteries and mobile phones collected through the Call2Recycle® program and RBRCC BC plan are and will be reclaimed. However, different battery chemistries require different reclamation methods. Therefore, RBRCC utilizes and will continue to utilize several service providers.

Unsorted used batteries (and used cell phones) collected under the Call2Recycle® program are sent, as of the time of this submittal, to Newalta Services in Fort Erie, Ontario for sorting. Newalta has been providing sorting services for Call2Recycle® since 1997 and has an exemplary record. From Newalta, sorted materials will be sent to licensed and well-operated commercial reclamation facilities in Canada, the U.S and Europe. At least initially, nickel-containing batteries will be processed at Inmetco's facility, Ellwood City, Pennsylvania facility; lead-containing batteries will be sent to Nova Pb in Ville Ste-Catherine, Quebec, Ontario; Lithium Ion batteries will be sent to Xstrata in Sudbury, Ontario and non-rechargeable batteries will be sent to a yet to be determined processor.

Sorted alkaline batteries may be sent in bulk (>500 kg) directly to a recycling center located in the province. Given some recent disruption in the marketplace, we are unable to confirm the processor at this time. Details on this arrangement are in development and will be in place by time of launch.

Cell / mobile phones are also currently sent to Newalta for sorting and then sent to a processor for potential refurbishment or recycling. No waste from this process will be disposed outside of North America.

All of these facilities use thermal recovery processes to reclaim materials. Recovered metal materials include: nickel, iron, lead, cadmium and cobalt. These metals are either returned to rechargeable battery manufacturers or used to make other products such as stainless steel. Some processes also recover plastic and other constituents.

To expand their existing extensive recycling network, Call2Recycle® has issued a Request for Proposal (RFP) (*Appendix 24*) to potential primary battery processors and sorters who will bid on fulfilling services in the future. All providers will be held to the same standards of environmental and efficiency excellence as demanded from existing service providers.

Due to some recent disruption to the review process, the primary battery processor and sorter will not be formally selected until after the first of the year.

6.0 PERFORMANCE MEASURES

In the past three years, Call2Recycle® has collected 55,727 kilograms of batteries in British Columbia, with 25,413 kilograms having been collected in 2008.

Here is a summary of British Columbia battery collections of the Call2Recycle® program (in kilograms) in the last three full years:

	2008	2007	2006
Ni-Cd	13,492	11,079	13,638
Ni-Mh	2,444	1,595	184
Li-ion	5,214	1,206	201
SSLA	3,456	1,509	351
Primary	806	507	43
Total	25,413	15,897	14,417

Call2Recycle® measures its performance both on the amount it collects and the amount reclaimed from each battery that can be used in secondary products. The program abides by the European Union Battery Directive on "Recycling Efficiency" in both how to calculate these rates and also what benchmarks for recovery are appropriate based on battery chemistry.

Below are the expected battery recovery rates under the Call2Recycle® program:

Call2Recycle® Recycling* Rates

Battery Chemistry	Recovery Rates
Primary Alkaline	50%
Small Sealed Lead Acid (SSLA)	65%
Nickel Cadmium	75%
Other Rechargeables	50%

** "**Recycling**" rate in this context refers to the weight of each battery reclaimed for use in a secondary product. This is sometimes referred to as "**recovery rate.**"*

Calculating the amount of batteries collected as a percentage of the batteries sold is often highly problematic for two reasons. First, batteries are often sold through a

complex sales chain, from manufacturer to battery-powered product manufacturer to wholesaler to distributor to retailer. Most battery stewards can only estimate sales into BC. Second, depending on the chemistry of the battery, as many as 95% of batteries are sold in or with a product, further complicating tracking, disposal and recycling.

Below represents the best faith estimate of the amount (by weight) of batteries sold into British Columbia and the target collection rate[1] for the Call2Recycle® program:

Call2Recycle® Collection Targets
(Weights in Kilograms)

Batteries Sold / Collected	Base Year*	2010	2011	2012	2013	2014
Batteries Sold Into BC**	2,465,000	2,514,000	2,565,000	2,616,000	2,668,000	2,721,000
Primary Batteries Collected***	1,000	201,000	308,000	376,000	448,000	544,000
Secondary Batteries Collected***	30,000	50,000	77,000	94,000	112,000	136,000
Total Collected	31,000	251,000	385,000	470,000	560,000	680,000
Collection Rate Targets						
Primary Batteries		10%	15%	18%	21%	25%
Secondary Batteries	6.1%	10%	15%	18%	21%	25%
Total Collection Rate	1%	10%	15%	18%	21%	25%
Grams per capita		58	89	110	130	158

** Assumes that program years, including based year, runs from July 1 – June 30.*

*** **"Batteries Sold into BC"** represents estimates developed by industry stewards based on total Canadian battery sales allocated by provincial population. Years 2010-2014 assume an annual increase in sales of 2%. Upon launch, more accurate baseline information will be used based upon collection of sales data from battery stewards.*

**** **"Batteries Collected"** will be reported by major chemistry and will not simply be reported as **"primary"** and **"secondary"**. Estimates of subcategories of batteries collected would be too speculative at this time.*

[1] ***"Collection Rate"*** used throughout this document mirrors BC's regulatory use of the term ***"Recovery Rate"***, that is, the batteries collected for recycling in the market divided by the number available for collection (expressed as a percentage).

There are no available estimates on primary batteries currently collected in BC. Many programs collect primary batteries and there is no central source for this information.

Because of the lack of available data on primary batteries, committing to higher collection targets would be unduly reckless. The most successful battery collection programs in the world have taken ten years to surpass 50% collection rates; none have attained 25% within five years. The aforementioned targets are ambitious yet realistic.

We remain concerned about the impact that pending permitting regulations may have on the collections under the program. We believe that implementation as it currently stands will significant affect collection performance. If this is how the regulations will be implemented, we suggest that the table below should be used to project collections:

Call2Recycle® Collection Targets
(Weights in Kilograms)

Batteries Sold / Collected	**Base Year***	**2010**	**2011**	**2012**	**2013**	**2014**
Batteries Sold Into BC**	2,465,000	2,514,000	2,565,000	2,616,000	2,668,000	2,721,000
Primary Batteries Collected***	1,000	100,500	154,000	188,000	224,000	272,000
Secondary Batteries Collected***	30,000	25,000	38,500	47,000	56,000	68,000
Total Collected	31,000	125,500	192,500	235,000	280,000	340,000
Collection Rate Targets						
Primary Batteries		5%	7.5%	9%	10.5%	12.5%
Secondary Batteries	6.1%	5%	7.5%	9%	10.5%	12.5%
Total Collection Rate	1%	5%	7.5%	9%	10.5%	12.5%
Grams per capita		29	44	55	65	79

** Assumes that program years, including based year, runs from July 1 – June 30.*

*** **"Batteries Sold into BC"** represents estimates developed by industry stewards based on total Canadian battery sales allocated by provincial population. Years 2010-2012 assume an annual increase in sales of 2%. Upon launch, more accurate baseline information will be used based upon collection of sales data from battery stewards.*

**** **"Batteries Collected"** will be reported by major chemistry and will not simply be reported as **"primary"** and **"secondary"**. Estimates of subcategories of batteries collected would be too speculative at this time.*

We hope that the work underway with the Ministry of the Environment will yield a positive result so that Call2Recycle® may expect greater collections.

The above numbers include batteries that are in electronic products covered by the Electronic Stewardship Association of British Columbia (ESABC) to fulfill provincial regulatory requirements but not cell phones or batteries expected to be collected by the Canadian Wireless Telecommunications Association (CWTA).

Specific performance measures in the collection and recycling of cell / mobile phones can only be determined based on increases in collection since there are several collection program schemes within the Province. In 2009, Call2Recycle® expects to collect a recycle approximately 1400 kg / 8000 units, which it expects to increase by approximately 20% per year for the next three years.

6.1 CONTINUOUS IMPROVEMENT

RBRCC, in conjunction with RBRC, analyzes numerous metrics to determine more effective methods of increasing participation in the Call2Recycle® program. RBRCC measures the amount of designated waste recycled by weight. RBRCC collects weight data on a monthly basis and compares the amount collected with previous months and years. RBRCC then calculates a BC diversion rate in accordance with the methodology set forth in *Appendix 25*. All these practices will be continued as part of the RBRCC BC plan.

RBRCC also employs sophisticated tracking and reporting software that allows for the preparation of various reports pertinent to the Call2Recycle® plan and reporting requirements.

The reporting capabilities allow RBRCC to generate reports with unique and detailed data *(Appendix 26)*, such as:

- By City, Region, postal code, and overall Province
- By individual site
- By day/month/year or any other required time period
- Retail store or chain
- By collection channel
- By weight and containers received
- By battery type (chemistry)
- Comparative analysis including participation rates

Call2Recycle® also expects to report on collection information on a per capita basis.

RBRCC will continue to directly communicate with individual collection sites regarding their activities by tracking monthly totals of rechargeable batteries and cellular phones collected, RBRCC can use targeted outreach efforts to increase collections and participation rates at individual collection sites or areas.

Historically, RBRCC's strategic planning has been grounded on facts obtained through consumer awareness surveys. These marketing plans were developed partly by segmenting consumers with similar recycling characteristics to better disseminate Call2Recycle® 's message. For instance, in a recent analysis, consumer segments included heavy use recyclers, light use but dedicated, hoarders, reforming heavy users, abashed trashers, unabashed trashers, those who didn't care and those with no occasion to recycle. This analysis helped RBRCC create more effective promotional materials and thus increase participation among consumers. Analogous efforts will continue in support of the ongoing success of the Call2Recycle® British Columbia plan.

Furthermore, in keeping with the *continuous improvement* mandate established from the beginning of the Call2Recycle® program's implementation, Call2Recycle® British Columbia staff will monitor results on a monthly, quarterly and annual basis. In addition to quantitative performance indicators such as site participation and collected tonnage, this will allow success to be measured according to website visits, media impressions and targeted surveys.

Finally, RBRCC has long required vendors to meet rigorous qualification standards for collection and processing of batteries. Details of the standards are provided in *Appendix 27*. These will continue to be used as part of the Call2Recycle® British Columbia Plan.

Continuous improvement is fundamental to the current and future success of Call2Recycle®. As such, ongoing investment in research and development to enhance our collection and recycling infrastructure has been essential.

To ensure continued leadership in learning and program effectiveness, RBRCC and its parent RBRC participate in an extensive number of initiatives to coordinate and develop best practices with analogous battery organizations operating around the world, such as RECHARGE in Europe and PRBA in the U.S. In addition, RBRCC and RBRC support and cooperate in research and development programs seeking better mechanisms to recycle rechargeable and primary batteries. Most recently, through the American Recovery and Reinvestment Act of 2009 (the "Stimulus Act"), RBRC has been included in two applications that have been filed with the U.S. Department of Energy to improve the recycling of lithium ion and primary batteries.

Industry-wide investments are further supplemented by individual R&D initiatives spearheaded by our battery stewards, all of whom also support the Call2Recycle® British Columbia plan and collection/recycling network. Details pertaining to various process investments may be found in *Appendix 28*.

In addition to processing and efficiency improvements, RBRC/RBRCC annually invests to improve marketing outreach and communication programs to maximize collections.

To do this, we have implemented and will continue to implement a number of initiatives to sharpen our message:

1. *Collection Infrastructure*

   Through research and development, RBRC/RBRCC periodically assesses the program offerings, including collection boxes, plastic bags, shipping guidelines, and informational materials. When the Call2Recycle® British Columbia plan is expanded, research and development will remain an important element, including the investigation of a collection box redesign to improve safety and transportation requirements.

2. *Brand Awareness*

   To better understand driving forces behind consumers' "green" practices and attitudes, and to determine consumer recycling habits in general, Call2Recycle® has been tracking consumers' attitudes and practices for the past three years. The information gained from these surveys is distributed to media outlets and participants, and gives Call2Recycle® an opportunity to further spread the word about battery recycling. (*Appendix 29*)

   Additionally, program awareness will be tracked among key audiences, including Retail Partners, Collection Site Managers, Key Opinion Leaders, and Green Business Executives. A brand awareness study performed among US and Canada audiences, will explore the current awareness and perception of the Call2Recycle® program, the importance of recycling, environmentalism and sustainability and how it impacts their organization, the relative importance of battery recycling within their activities (including awareness of the difference between rechargeable and regular batteries), and attitudes and motivation for environmental activities (including revenue opportunities). The brand awareness study will provide a reliable and actionable baseline measure and tracking measurement for Call2Recycle® 's branding efforts. This study is currently scheduled to be conducted in 2009 and again in 2010; however, may be expanded upon acceptance of the proposed Call2Recycle® plan.

   RBRC/RBRCC is undergoing a brand enhancement project to establish Call2Recycle® as its primary brand identifier by associating itself with environmental stewardship and "doing the right thing" in the broader sustainability sense. To do this, a branding effort is being developed to identify batteries and their environmental characteristics within the larger context of sustainability. Call2Recycle® will reposition itself to be synonymous with environmental stewardship by serving as the best mechanism for battery manufacturers (as well as consumers) to fulfill their product stewardship responsibilities. Through this branding project, the Call2Recycle® brand will serve the goal of unifying its purpose, mindset and mission.

3. *Program Efficiencies*

On behalf of RBRC, the Product Stewardship Institute (PSI) has developed a set of metrics for assessing the performance of programs that collect and recycle primary and rechargeable batteries that policy makers, program participants, and other stakeholders can use to evaluate and strengthen battery collection initiatives. Through this study, Call2Recycle® gained even further insight into performance-based metrics that will help supplement measures of the number of batteries collected, or a collection rate that is based on the number of batteries available for collection. (See *Appendix 30*)

Additionally, RBRC commissioned a research study to gain information on the market shares of key companies in the portable rechargeable battery market in the U.S. and Canada. Included in this study is also an estimate on the number of batteries sold separately versus those sold in products. The results from this study will assist RBRC/RBRCC in understanding the landscape of the primary players and the collection potential in both the U.S. and Canada.

4. *Processing*

Pursuing the automation of sorting process for collected batteries will significantly improve the efficiencies of the battery recycling infrastructure. This initiative in addition to other continuous improvement opportunities will form the foundation of ongoing R&D initiatives for RBRCC.

7.0 PROGRAM SCHEDULE – MILESTONE DATES

Public Consultations:

Monday October 5, 2009 – Vancouver***

Time: 1:30 – 3:30 pm
Location: The Coast Vancouver Airport Hotel
1041 SW Marine Drive
Vancouver, BC V6P 6L6
*** Webcast also to be available for those unable to travel to any of the meeting locations listed

Tuesday October 6, 2009 - Nanaimo

Time: 10:30 am – 12:30 pm
Location: The Coast Bastion Inn
11 Bastion Street
Nanaimo, BC V9R 6E4

Wednesday October 7, 2009 – Kelowna
Time: 10:30 am – 12:30 pm
Location: Delta Grand Okanagan
1310 Water Street
Kelowna, BC V1Y 9P3

Submission of the stewardship plan to the Ministry of Environment:
- December 1, 2009

Program operational:
- July 1, 2010

8.0 PROGRAM INCLUDED AT STARTUP

The program will commence with the list of products required by the regulation:

- Batteries eligible for collection and recycling are those weighing less than 11 lbs/5 kg each of the following chemistries::
  - **Nickel Cadmium (Ni-Cd)**
  - **Nickel Metal Hydride (Ni-MH)**
  - **Lithium Ion (Li-ion)**
  - **Nickel Zinc (Ni-Zn)**
  - **Small Sealed Lead (Pb)**
  - **Alkaline-Manganese and Zinc-Carbon**
  - **Zinc-air**
  - **Silver Oxide**
  - **Lithium (li)**

- Rechargeable batteries power cordless power tools, cellular and cordless phones, laptop computers, camcorders, two-way radios and digital cameras. All types of cell phones are accepted - any size, make, model, digital or analog, with or without battery or charger.
  - The program does not recycle household cordless phones, mobile installed or bag phones, two-way radios, or pagers.

- Cell phones / mobile phones including "smart phones" but not cordless phones.

- Call2Recycle® **DOES NOT ACCEPT** the following types of batteries:
  - Small Sealed Lead Acid weighing **more than** 11 lbs/5 kg each
  - Wet celled batteries (including car batteries)

9.0 FUNDING

As of the submission of this plan, more than 175 rechargeable battery manufacturers and marketers finance the *Call2Recycle®* program. These companies support RBRCC

by licensing from RBRC the right to place a trademarked *Battery Recycling Seal* ("Seal") on their Ni-Cd, Ni-MH, Li-ion, Ni-Zn and Pb batteries and/or battery-powered products sold in the United States and Canada. *(Appendices 31 & 32)* Fees are based on the total number of licensed battery cells sold into North America, without distinction on the nation, state or province in which the sales occur, and cover the total cost of the RBRC/RBRCC North American rechargeable battery program. Those RBRC licensees selling products in BC would be considered stewards. No additional fees will be assessed against those licensees to support the RBRCC BC plan described here.

Funding for costs of the RBRCC BC plan attributable to non-rechargeable batteries will be provided on a quarterly basis by stewards of those products who have chosen to support the Call2Recycle® stewardship plan.

As of the date of submission of this plan, Energizer Inc., Panasonic North America, Inc., Duracell, Inc. (Procter & Gamble), Rayovac (Spectrum Brand), Sony Canada and Kodak Canada have agreed to support expansion of RBRCC's British Columbia program to cover non-rechargeable batteries. (See *Appendix 33*) With Ministry approval of our plan, RBRCC will work to alert all battery manufacturers of their financial and regulatory responsibilities for the implementation of this plan. Assessed fees will be based on relative sales into BC amongst the non-rechargeable battery industry.

10. RESPONSIBILITIES AND OBLIGATIONS

The program plan is based on a shared responsibility model where all affected parties have a role to play.

10.1 Processing and Recycling Contractors

The current RBRCC program operates, and RBRCC BC plan will operate, in accordance with intra- and inter-provincial shipping and transportation approvals provided by Transport Canada, the BC Ministry of Environment and all other provincial environment and transportation ministry approvals. All shipments that are transported internationally are manifested in compliance with the Basel Convention and ISO certifications.

10.2 Provincial Government

The provincial government is expected to ensure that regulations allow for adequate fines and penalties to be levied against those individuals not in compliance with the regulation or the approved program. The provincial government is also expected to enforce program compliance in a timely and effective manner.

The provincial government is also expected to implement policies to ensure that government procurement officials only procure batteries and cell phones from program compliant corporations.

10.3 Local Government

Local government may wish to act as collection sites for designated material with appropriate reimbursement for services provided. Nothing in this plan is intended to dictate whether a local government participates as a collection site.

10.4 Consumer or End User

Consumers will be responsible delivering designated batteries to collection points.

10.5 RBRCC

RBRCC will manage Call2Recycle® to provide an environmentally effective program at the lowest responsible cost and will ensure that the public is kept informed of program costs and activities.

11.0 RECYCLED MARKET DEVELOPMENT

In contrast to some other materials collected through recycling efforts, markets are well developed for the metals and other materials reclaimed from used batteries. Ready insight into these markets can be obtained at the website www.metalprices.com/FreeSite.

The diligence of RBRCC and its' recycling suppliers to ensure that the maximum reuse potential of recovered metal is a cornerstone of the longevity and credibility of the Call2Recycle® program.

12.0 ANNUAL REPORT

RBRCC will provide an annual report to the British Columbia government as stated in the regulation. The annual report will also be available on the program website as a PDF file. The report will include, but not be limited to, the following:

- A summary of the educational materials and educational strategies used for Call2Recycle
- The location of collection facilities, events and any changes in the number and location of collection facilities
- A description of how the recovered products were managed in accordance with the pollution prevention hierarchy
- An estimate of the total amount of designated products sold and the total amount collected
- Independently audited combined financial statements of RBRC (USA) and RBRCC (Canada) and performance results specific to British Columbia
- A comparison of the approved plan performance for the year with the performance requirements and targets in the regulation and the approved plan

PART B – ALIGNMENT WITH MINISTRY OF ENVIRONMENT BUSINESS PLAN PRINCIPLES

Producer/User Responsibility

- Responsibility for waste management is shifted from general taxpayers to producers and users
- The management of used batteries covered by this stewardship plan is solely the responsibility of producers and users of these products
- Responsibility is not shifted to other levels of government without consent

Responsibility, detailed by agreed contracts, will take place only where local governments willingly consent to involvement in the recovery system.

Level Playing Field

- All brand owners are subject to the same stewardship obligations.
- 180 manufacturers of batteries and products that contain batteries have agreed to participate in a common collection and recycling program. Through market monitoring, retail competition and collection audit, non-participating brand owners will be identified and brought into the system through cooperation or, if necessary, through the enforcement provisions of the Regulation.
- All consumers, businesses, municipalities and public agencies have free access to Call2Recycle® collection facilities.

The combination of collection sites and systems to be used for batteries will ensure that consumers in all regions of the province have reasonable access.

Results Based

- Programs focus on results and provide brand owners with flexibility to determine the most cost-effective means of achieving the desired outcomes with minimum government involvement.
- The program outlined in this stewardship plan allows for maximum flexibility in determining the most cost-effective method of achieving satisfactory recovery results. Government involvement will be minimized at all levels.

Continued innovation is the hallmark of the battery industry. Collection programs as detailed in this stewardship plan provide the segregation of products necessary to produce the most beneficial environmental and economic outcomes available.

Transparency and Accountability

With the RBRCC being already well-established through our 12 years of in-market experience, the infrastructure and processes are in place to allow the RBRCC BC Plan to commence immediately upon approval. Operation will proceed as it has in the past, building upon already trained collection sites, service chain providers, and existing communication relationships in the marketplace. To ensure that we tap into every BC resource to maximize collections and the success of the Call2Recycle® program, we intend to establish an internal advisory committee that will track our success and innovate additional programs. The members of this committee will include representatives of rechargeable battery manufacturers, rechargeable product manufacturers and primary battery manufacturers in addition to representatives from our collection chain and invited representatives from the BC Ministry of Environment.

APPENDICES

Appendix 1.1

Questions and Comments (along with responses) from the Public Regarding Call2Recycle's All-Battery Product Stewardship Plan

QUESTIONS ARISING AT PUBLIC CONSULTATION SESSIONS

Does it matter where the batteries come from?

No. All consumer battery chemistries will be accepted in our Call2Recycle® program.

Will Call2Recycle® provide the packing tape for the boxes and batteries to be collected?

Free collection boxes provided to all Call2Recycle® collection sites contain plastic baggies that should be used to contain each battery collected and put into our collection box. Once full, the collection box can be sealed with the double-sided tape that is on the top flap of our box. If a site runs out of plastic baggies, they can call our team (888-224-9764) and they will send additional supplies. Alternatively, they can use non-conductive electrical tape to separate the battery terminals from others.

Can more than one battery be put in a bag?

No. The objective of the bag is to provide a physical separation between batteries as a safety measure.

More information needed regarding drums and shipping requirements.

Thank you. We will ensure that our "how to ship" communication materials properly explain how large quantity collection sites can ship in drums rather than using our 20 lb or 40 lb collection boxes. Details about our safety & shipping instructions may be found by visiting: http://www.call2recycle.org/safety-guidelines.php?c=79&d=103&w=2&r=Y

Who are our marketing partners?

Call2Recycle® has a wide range of program supporters who help to advance the awareness and participation in our battery collection program. Included on our list are: our Licensees (each of whom markets and sells batteries; in addition to incorporating the RBRC Seal on their batteries, we encourage them to educate their customers how to participate in Call2Recycle®); our collection sites (each collection site interacts with customers and battery users on a regular basis; education and promotion materials in addition to our collection containers are provided to them for their ongoing communication use); government (provincial, regional, local as well as federal — all of whom who have ongoing interaction with the public who are interested in environmental initiatives and how they can participate); Recycling Council of British Columbia as well as Kids Help Phone and other organizations with whom Call2Recycle® works to advance our communication and program support messages.

Municipalities are going to incur costs for preparing shipments. Will these be reimbursed by Call2Recycle?

Larger quantity generators such as municipalities have and will continue to have the option to utilize their own shipping containers, utilizing pre-approved labeling and adhering to the same preparation requirements (*e.g.,* use of plastic bags to contain each collected battery) as with the Call2Recycle® collection containers. For those Call2Recycle® municipal collection locations that generate at least 150

kilograms of batteries per shipment, Call2Recycle® will entertain a negotiated fee to support the municipalities' costs for sorting, packaging and handling material.

Regarding the collection of cell phones, are cordless phones included?

Any cellular phone and cellular phone rechargeable batteries are accepted in the Call2Recycle® program. Any size, make, model, age of phone, digital or analog, with or without battery will be accepted. However, household cordless phones, mobile installed or bag phones, two-way radios and pagers cannot be included for recycling.

Are cell phone accessories accepted as well?

Yes, both the cell phone and any accompanying accessories are accepted for collection in Call2Recycle®.

Are you going to impose an "eco-fee" on (alkaline) batteries collections?

Right now, there is no charge to participate in our collection and recycling program for rechargeable batteries, with the program support funds being paid for by the manufacturers and marketers of batteries who are licensees of the Call2Recycle® program. This will be the same approach used when Call2Recycle® expands our collection to all batteries in British Columbia.

Consider promoting your program in our municipal calendars that we distribute to our residents.

Thank you for this suggestion. We will include this in our review of available communication options to reach the public and program participants.

QUESTIONS RECEIVED POST OUR PUBLIC CONSULTATION SESSIONS

1. What are the details for the Pollution Prevention side of things - what are the component materials of the batteries & cell phones? What happens to those materials (in terms of process, reuse, recycling, waste)? These details should be included in the plan as well as how the program plans to move the materials up the waste hierarchy.

Considerable proactive investment of time, effort and money has been devoted in recent decades to respect and incorporate 3Rs (Reduce, Reuse and Recycle) programs in the design, manufacture and end-use management of portable batteries by licensees of the Call2Recycle® program and the primary battery manufacturers included in our program plan for British Columbia. The reduction/elimination of mercury in primary alkaline & carbon zinc batteries and discontinuation of mercuric oxide batteries were completed in 1996. Zinc air button cells were introduced in the same year (as a replacement to mercuric oxide button cells) with a no-added mercury version having been technically developed and to be introduced by 2010. In addition to the above, a voluntary recycling program for Nickel-Cadmium (NiCd) rechargeable batteries was introduced across Canada in 1997 which then resulted in further collection enhancements in recent years to include the recycling of all rechargeable batteries and cell phones. Consumers have a wide range of choices of battery product types that can address 3Rs and our industry has demonstrated throughout many decades our commitment (past, ongoing and future) to proactively reflect environmental respect within our product offerings.

Regarding the specifics of our Call2Recycle® program, when collected, the batteries and cell phones are sent to our consolidation centre (Newalta Services) for sorting according to chemistry. Newalta has been providing sorting services for Call2Recycle® since 1997 and has an exemplary record. From Newalta, sorted materials are sent for recycling, incorporating thermal recovery processes which reclaim the metals, at licensed commercial reclamation facilities in Canada, the US and Europe. At least initially, nickel-containing batteries will be processed at Inmetco's facility in Ellwood City, Pennsylvania; lead-containing batteries are sent to Nova Pb in Ville Ste-Catherine, Quebec; Lithium Ion batteries are sent to Xstrata in Sudbury, ON and non-rechargeable batteries will be sent to a yet-to-be-determined processor. The recovered materials are then made available for use in new products such as batteries and stainless steel. Cell phones are refurbished and resold when possible with a portion of the proceeds received from the resale of phones benefiting select charities including *Kids Help Phone*.

Our program will not ship any used batteries or cell phones to a processor that has not been qualified by Call2Recycle®. Work to qualify potential processors by Call2Recycle® is in the process of completion. Processors will be selected through a competitive process that will require compliance with applicable environmental, health and safety and transportation regulations including, but not limited to, the following:

- Basel Action Network (BAN) qualification and ISO certification
- Final destination receipt and disposal documentation/certification, downstream processing material management and residual material and waste management
- Recycling processor standards as adopted by the Electronic Stewardship Association of British Columbia (ESABC)

2. What is your organization doing to encourage design for the environment? (such as reuse, reduction in materials used or the toxicity of the materials, etc). There should be a DfE component in the plan.

As mentioned above (Question 1), considerable proactive investment of time, effort and money has been devoted in recent decades to respect and incorporate 3Rs (Reduce, Reuse and Recycle) programs in the design, manufacture and end-use management of portable batteries by licensees of the Call2Recycle® program and the primary battery manufacturers included in our program plan for British Columbia. The reduction/elimination of mercury in primary alkaline & carbon zinc batteries and discontinuation of mercuric oxide batteries were completed in 1996. Zinc air button cells were introduced in the same year (as a replacement to mercuric oxide button cells) with a no-added mercury version having been technically developed and to be introduced by 2010. In addition to the above, a voluntary recycling program for Nickel-Cadmium (NiCd) rechargeable batteries was introduced across Canada in 1997 which then resulted in further collection enhancements in recent years to include the recycling of all rechargeable batteries and cell phones. Consumers have a wide range of choices of battery product types that can address 3Rs and our industry has demonstrated throughout many decades our commitment to proactively reflect environmental respect within our product offerings.

All of the above have been done well in advance of <u>regulated</u> *Extended Producer Responsibility* programs, reflective of an industry committed, both in the past, ongoing and into the future, to incorporating environmental stewardship within the context of business actions.

3. What are all the performance measures that will be used? There should be consumer awareness, collection per capita, recovery or capture rate, GHG impact of the program and accessibility measures.

As identified in our plan (Section 6), Call2Recycle® has developed a wide-range of performance measures that will help track achievements and develop insight to enhance continued program success.

RBRCC uses the Call2Recycle® brand as the primary means to communicate with our stakeholders. With baseline program awareness data being compiled in 2009, RBRCC will continue to measure our brand awareness and program understanding, helping to assess our ability to communicate appropriate behaviours and actions and incorporate improvements as appropriate.

Our collection performance is tracked on a daily, weekly, monthly and yearly basis, both overall, by chemistry and accounts, as well as a wide range of other analytical measures to ensure that we maximize our performance and collection results. Call2Recycle® also routinely assesses the accessibility of its collection sites, which is a critical dimension in maximizing collection. By comparing collection sites with demographics of the British Columbia population, Call2Recycle® identifies underserved areas and populations. In this regard, while Call2Recycle's current 1150 collection locations serve as an effective foundation for this program, Call2Recycle® anticipates significant growth in sites, particularly during the first few years of implementation of an all-battery plan.

4. The plan mentions a seal to be shown on batteries. Are all the manufacturers on board with this and how long will it be until it is implemented? Sounds like a great idea.

Our Battery Seal has been an integral part of our program since its inception in the mid 1990s. As a Licensee of the Call2Recycle® program (Rechargeable Battery Manufacturer), it is a requirement to place the seal on all rechargeable batteries sold in North America within 6 months of becoming a Licensee. The use of this seal accompanies the payment of license fees which fund Call2Recycle's efforts to provide for the environmentally-sound collection and recycling of used rechargeable batteries and a nationwide public education program about rechargeable battery recycling. Reflective of the concentrated focus of Call2Recycle's proposed incorporation of primary batteries in our program plan for British Columbia, the placement of our Battery Seal is not a requirement for our primary battery program participants at this time. It is important to note that regardless if a rechargeable or primary battery has-or-does-not-have our Battery Seal, it is still accepted for collection in our program.

5. How will the program handle the sale of batteries within products? It will be a challenge but what are the steps the program will take to ensure a level playing field in this regard? These steps should be included in the plan.

Brand owners that are part of our Call2Recycle® program contribute funding for both standalone batteries as well as the batteries that are sold into the marketplace that are part of another product. "Easily removable" has been a mantra now for well over a decade for most products that contain batteries to permit their replacement as well as collection for recycling.

6. As your program is international, how will you deal with the separate communications for the BC market? (i.e. all batteries collected in BC but I assume still only rechargeables in most other jurisdictions).

While Call2Recycle® operates both nationally and into the United States, much of our communication program is focused locally through our program collection sites as well as the outreach utilized in our public relations, social marketing and advertising initiatives. Our marketing and communication intent is to ensure that British Columbians understand that batteries can be recycled through Call2Recycle® and how they can participate in our program.

7. What is the success rate of your communications to-date (i.e. level of consumer awareness of the program) in BC or even in Canada?

Please refer to Appendix 27 for details of our market research investigations that have been conducted over the past 3 years to assess current brand awareness of Call2Recycle®. Section 6.1 of our plan – Continuous Improvement – also details our efforts to use current awareness of Call2Recycle® as the basis for annual and ongoing assessments of awareness developments as our program continues to expand and entrench itself into all aspects of BC society.

8. The plan mentions cooperating with the BC MOE to develop new PSAs. Why would the program need the MOE cooperation? Would this not be the responsibility of the program to advertise its service?

It will be the responsibility of Call2Recycle® to create, develop and promote the Public Service Announcements (PSAs) as well as the support programs to create awareness and participation in Call2Recycle® in British Columbia. Securing the input of the BC Ministry of the Environment is a component of a good working relationship and partnership whose participants are operating with the same objective: offering and providing a battery recycling program for the citizens of British Columbia.

9. How will the program interact with the other cell phone programs in terms of communications, collections of others' materials and reporting on performance measures?

Call2Recycle® will continue to collect and recycle cell phones as part of our battery collection program. Reflective of the voluntary nature of our program, this does not obligate any business, organization, public agency, municipality or resident to use our program for the collecting of cell phones (or batteries). It is their choice as to how and whether they want to participate in Call2Recycle®. Currently, Call2Recycle® sends all cell phones to Market Velocity for recycling/refurbishing and has no plans to use other companies or organizations upon the approval of our collection program in British Columbia. While ours is not the only cell phone collection program, Call2Recycle® welcomes partnerships with existing and potentially additional cell phone collection initiatives with, at minimum, offering free collection and recycling services for any batteries collected by other cell phone programs through Call2Recycle®.

10. The targets are too low. As the program already has a collection network in place and communications developed, there is no reason not to set a much higher target and develop steps to get there (whether it be waste audits, working on landfill bans, community based social marketing projects, more targeted communications or research to understand what the barriers are). A low collection rate in Europe with very different systems to ours is no reason to not strive for higher here in BC where we are starting to develop a culture of using EPR programs to deal with products responsibly. If the lack of accurate sales data into BC is a problem, start working with Regional Districts to do waste audits to determine how much program product is leaking from the program.

The objective of Call2Recycle® is to collect and recycle batteries (and cell phones) from all aspects of society in British Columbia. We have developed and, with this proposed expansion, will provide the most comprehensive, free collection and recycling service for batteries in British Columbia. We welcome everyone's participation and support.

The setting of the targets identified in our plan reflects the reality of battery collection from many, many years of in-market experience in a wide number of countries. The best performing countries to-date: Germany, Belgium & France – have had mandatory, all-battery recycling programs in place for several years. In their first number of years, none of these countries realized a 25% collection rate. The learning gained from this is that consumer behaviour simply does not change overnight; a sustained effort over many years is essential to success.

Collection efforts in Canada to-date have been purely voluntary; it is the choice of the individual whether to recycle their batteries or not. The considerable difference in population concentrations between European countries and Canada also can have an impact on accessibility and convenience of collection efforts.

Waste audits of residential garbage have been conducted in the past to assess the number and amount of batteries available for recycling. Relative to the amount of other "traditional" recyclable materials (pop cans, newspapers) as well as organics that were thrown out, the number of rechargeable batteries was very low and primarily contained in electronic equipment. With the availability of an all battery program as well as the expansion of e-waste programs, it is anticipated that our collection efforts will capture most batteries available for recycling.

I appreciate the efforts that you have made to develop the program and the fact that the program existed even before legislation (for rechargeables and cell phones). I also applaud the fact that there are no visible fees with the program so that it is treated the same as any other business cost. Well done in getting started on your program.

Appendix 1.2

Participants at the October 5th, 2009 Vancouver BC Stewardship Public Consultation Meeting

In Person (at The Coast Vancouver Airport Hotel)
Maury McCausland, London Drugs
Paul Iverson, Residuals Management Group Ltd.
Martin Dickson, Thompson-Nicola Regional District
Kim Day, Ridge Meadows Recycling
Jeff Levitt, Target Zero Waste Consulting Inc.
Neil James, Ralph's Auto Supply (BC) Ltd.
John Hibbard, HAZCO Environmental Services
Daniel Chau, HAZCO Environmental Services
Richard Aikema, Abbotsford Mission Recycling Program
Bruce Shore, Genesis Recycling
Mona Fadl, Keystone Environmental
Bruce Turkinglon, Xentel DM
Michael Gibson, HouseSmart Network
Shell Busey, HouseSmart Network
John Bailie, Sonsonate Consulting

Call2Recycle® Staff
Carl Smith
Susan Antler
Dana Uhl-Griffiths
Barb Zabinsky

Via Webcast (from The Coast Vancouver Airport Hotel)
Paul Knight, eCycle Solutions
Ilse Sarady, Society Promoting Environmental Conservation
Jagdeep Grewal, Newalta
Bill Whelan, HEWLETT-PACKARD
Richard Unyi, Raw Materials
Karina Mehta, Hewlett-Packard
Barb Jusiak, CCGD
Mourad Chergui, Cadex Electronics
Emy Sai, City of Richmond
David Lawes, Ministry of Environment
Teresa Conner, Ministry of Environment
Frank (Last Name Withheld)
Alex Shelley, EarthCycle Planning - Staples Canada
Craig Ware, Loblaw Companies Limited
Donna Chau, Hewlett-Packard (Canada) Co.
John Yeider, Apple Inc.
Susan Nieuwhof, Procter & Gamble
Stephen Rathlou, S.C. Johnson and Son, Limited
Gregory G. Moeller, Eastman Kodak Company
Laurie Gallant, Regional District of Kitimat-Stikine
Sarah Webb, Canadian Tire Retail
Jacquelyn Desloges, Canadian Tire Retail
Ali A. Hamid
Jennifer Meier, District of Mission
Janet DeMarcke, City of Chiliwack
Sue Maxwell, Ecoinspire Consulting
Petra Wildauer, Regional District of Fraser-Fort George

Participants at the October 6th, 2009 Nanaimo BC Stewardship Public Consultation Meeting

In Person (at The Coast Bastion Inn)

Paul Shorting, Nanaimo Bottle Depot
Wendy Dunn, Capital Regional District
Gary Franssen
Joe Chatlain, Lafarge Canada
Michael Schellnick, Nanaimo Recycling Exchange
Teresa Conner, Ministry of Environment
Bob Paul, Ministry of Environment
Alex King, Nanaimo Recycling Exchange
Kathleen Milward, CVRD
Adam Newton, Nanaimo Bottle Depot
John Bailie, Sonsonate Consulting

Call2Recycle® Staff
Carl Smith
Susan Antler
Dana Uhl-Griffiths
Barb Zabinsky

Participants at the October 7th, 2009 Kelowna BC Stewardship Public Consultation Meeting

In Person (at The Delta Grand Okanagan)

Karmen Peace, Regional District of North Okanagan
Ed Columbus, Vernon and District Association for Community Living
Bill Matichuk, The Battery Doctors
Rae Stewart, Regional District of Central Okanagan
Eve-Lyn Wolters, Regional District of Central Okanagan
Beth Cavers
John Bailie, Sonsonate Consulting

Call2Recycle® Staff
Carl Smith
Susan Antler
Dana Uhl-Griffiths
Barb Zabinsky

October 8th, 2009 Prince George BC Stewardship Public Consultation Meeting Cancelled due to limited advance registration

Jonker, Jennifer B ENV:EX

From: Conner, Teresa A ENV:EX
Sent: Monday, December 7, 2009 4:33 PM
To: Carignan, Jawant; Hughes, Janet ENV:EX
Cc: Lawes, David ENV:EX; Roberge, Helene ENV:EX
Subject: Re: 117390

Hi Jawant/Janet,
Will this work for our response?
We followed up by email last Thursday and phone call today. Carl is working on amendments and will aim to resubmit plan to the director next week.
Teresa

From: Conner, Teresa A ENV:EX
Sent: Thursday, December 3, 2009 4:13 PM
To: 'Carl Smith'
Cc: Paul, Bob A ENV:EX
Subject: RE: BC Product Stewardship Plan

Thanks Carl,
11am on Monday morning works for us.

From: Carl Smith [mailto:CSmith@call2recycle.org]
Sent: Thursday, December 3, 2009 4:06 PM
To: Conner, Teresa A ENV:EX
Cc: Paul, Bob A ENV:EX
Subject: Re: BC Product Stewardship Plan

Teresa,

Thank you for the notes.

While I could respond to most, if not all, now, I agree it is best to wait for the call.

How would 11 am PST work on Monday?

Carl E. Smith, CEO/President
Call2Recycle
Recharging the Planet. Recycling your batteries.

+1.678.218.4586

From: Conner, Teresa A ENV:EX
To: Carl Smith
Cc: Paul, Bob A ENV:EX
Sent: Thu Dec 03 19:00:42 2009
Subject: BC Product Stewardship Plan

Hi Carl,

Bob and I have taken the time to review your stewardship plan submitted to the Minister on Monday November 30th. We would like to advise you that the review and approval of stewardship plans in BC is done by the director, final plans are best submitted directly to David Ranson.

We would like to arrange a time to discuss the comments below. What is your availability for Monday?

We have a few concerns with the plan as is and would like to speak to you before submitting this plan to the director. Some of the elements we feel need to be addressed are;

- No mention of a dispute resolution procedure 5(1)(c)(vi)

- Proposed recovery rates (given EU and Ontario targets, this would not position BC well to approve a plan with lower targets) 5)1)(a)(ii)

- Batteries collected will be reported on major chemistry and will not simply be reported as primary and secondary...we are assuming this is in addition to primary and second (as depicted by the chart on page 20)

- We would suggest stating at one point in the plan that plan collection and recovery is pendent on Haz Waste, rather than throughout the plan and remove chart on page 21.

Overall, there is a lack of performance measure and commitments in the plan. This has been stressed throughout the past year. Given the result based approach of BC, the measures are what makes the plan accountable to improvements. Some of the area that need a commitment to measure and improve are;

- How you will commit to reporting out, given the reporting capabilities listed on page 22 (e.g., per capita collection by Regional district). what will the director expect to see in your annual report?

- P.g. 23 – great to mention that R&D is ongoing, but again, a commitment to improvement. Given what is said in the plan, there is no commitment to continue these efforts (the director is left to make this assumption). Could you commit to continuing to invest in R&D and report annually on the work that is done?

- Product life cycle – while the recyclers may not yet be chosen, it would be good to gain a sense of the intentions here (e.g., Rick Uni on this weeks PSI call mentioned that 84% of the batteries composition is recycled and 16% towards energy recovery). Are there standards or goals having to do with production (using recycled materials) or recycling? Will products be managed in accordance with the pollution prevention hierarchy?

- Given the lower than BC's status quo recovery rate consumer awareness and collection/convenience become extremely important measures. I understand you are currently collecting 2009 data. How are you collecting? What will is measure and can you commit to establishing a target then (e.g., the end of first year).

- Collection/convenience – pg. 24. What will your periodic assessment be. How frequently? And will there be a commitment to tack actions base on these assessments?

- On page 22 you have highlighted you will work with ESABC to collate numbers. Is there a commitment to work with future stewardship agencies to attempt to do the same thing (a simple statement is

all we are looking for). We would assume that some small appliances and possibly other future plans may also get batteries back.

- On page 4 of the summary, it may be good to reference the appendices of members.
- Appendix 1.2 – best not to name individuals if not associated with an organization.
- Appendices in general – MoE posts all stewardship plans to our website. We would appreciate that only the appendices that are relevant to the plan approval are part of this plan. Others could remain on the RBRCC site as additional information.

Kind Regards,

Teresa Conner

Environmental Management Analyst

EQB, Ministry of Environment

3rd Floor - 2975 Jutland Avenue

Victoria, BC

Ph: 250-387-9754

Fax: 250-356-7197

Email: Teresa.Conner@gov.bc.ca

129810

EQ-F41

O'Brien, Kellie ENV:EX

From: Carl Smith [CSmith@call2recycle.org]
Sent: Thursday, August 5, 2010 2:02 PM
To: Carl Smith
Subject: New Executive Director -- Call2Recycle / RBRC of Canada

Please join me in welcoming Joe Zenobio as the new Executive Director of Call2Recycle®, operated by the Rechargeable Battery Recycling Corporation of Canada (RBRCC). Joe's appointment represents this organization's ongoing commitment to investing in the talent necessary to continue Call2Recycle's success in Canada.

Joe brings a wealth of experience, most recently with GS1, a non-profit e-Commerce firm working with retailers nationwide, first as President, GS1 Canada and then as Senior Vice President with GS1 United States. A native of Toronto, Joe has also managed multiple broadcast stations and served as a senior level executive with a major accountancy.

Joe joins Susan Antler and her experienced team in educating Canadians about recycling and ensuring that batteries are collected and recycled. Based in Toronto, Joe can be reached at: jzenobio@call2recycle.ca or by calling (647) 987-7371. Please contact him to wish him well or expect to hear from him in the near future.

Regards,

Carl E. Smith, LEED® AP
CEO / President, Call2Recycle®
Recharging the planet. Recycling your batteries.™

+1-678-218-4586 | csmith@call2recycle.org | www.call2recycle.org

BRITISH COLUMBIA

January 20, 2012

Joe Zenobio
Executive Director
Call2Recycle
Suite 606 - 4576 Yonge Street
Toronto, Ontario M2N 6N4

Dear Mr. Zenobio,

I am writing at your request to acknowledge support for your submission to RECYC–QUEBEC to manage the Battery Product Stewardship Program in Quebec.

Call2Recycle has operated an approved product stewardship program under the British Columbia (BC) Recycling Regulation since March 1, 2010. The Call2Recycle battery recycling program currently collects all types of household batteries and mobile telephones free of charge at over 1,200 sites across BC, including retail shops and municipal facilities.

The BC Ministry of Environment has enjoyed a very positive, professional and collaborative working relationship with the Call2Recycle organisation during the development and operation of their approved product stewardship plan.

We wish you success with your proposal to operate an approved battery collection and management program in Quebec and look forward to continuing our successful partnership in BC.

Regards,

David Lawes
Section Head, Industry Product Stewardship

Ministry of Environment
Community Waste Reduction Section
Environmental Protection Division
Mailing Address:
PO Box 9341
Stn Prov Govt
Victoria BC V8W 9M1
Telephone: 250 387-0389
Facsimile: 250 356-7197
Website: www.gov.bc.ca/env

BRITISH COLUMBIA

Reference: 163527

February 10, 2012

Joe Zenobio
Call2Recycle
4576 Yonge Street, Suite 606
Toronto ON M2N 6N4

Dear Mr. Zenobio:

Thank you for submitting the 2010 Call2Recycle annual report, received June 30, 2011. Thank you also for submitting the results of third party testing of your annual report. This will acknowledge and confirm that your report satisfies the reporting requirements under Section 8 of the Recycling Regulation.

Your report indicates that that the Call2Recycle program achieved a product recovery rate of approximately 9.6 percent, or 121,000 kg of batteries, in the six month period ending in December of 2010. I appreciate performance achieved over a six month period may not be fully representative of performance over a full year. Nonetheless, the product recovery rate performance fell short of the 12 percent recovery rate target to which Call2Recycle committed in its stewardship plan and I encourage you to take the necessary steps to ensure that the more ambitious future stewardship plan targets can be achieved.

I note that third party testing of non-financial information in your report found:

- A number of collection sites (7 of 25 sampled) were unable to demonstrate an understanding of the program sufficient to fulfil their role or could not be contacted.
- Some inconsistencies in stated shipments of batteries to processors.

While recognising that there will always be implementation challenges encountered in any new program I am asking that the Call2Recycle stewardship program work toward addressing the above issues.

I want to advise you that the reporting requirements under the Regulation have been amended to require that annual reports submitted from 2013 onwards include the total amount of the producer's product collected in each Regional District.

../2

Ministry of Environment
Office of the Director
Environmental Standards Branch
Environmental Protection Division
Mailing Address:
PO Box 9341 Stn Prov Govt
Victoria BC V8W 9M1
Telephone: 250 387-9933
Facsimile: 250 356-7197
Website: www.env.bc.ca/env

I look forward to receiving future annual reports detailing the program performance achieved as committed in your product stewardship plan. Should you have any questions, please contact Greg Tyson by phone at 250-387-9774 or by email at greg.tyson@gov.bc.ca.

Sincerely,

Kris Ord
Acting Director

pc: Greg Tyson, Environmental Standards Branch

File: 50400/25/ELEC RBRCC

Jonker, Jennifer B ENV:EX

From: Minister, ENV ENV:EX
Sent: Wednesday, February 6, 2013 2:32 PM
To: Correspondence Unit ENV:EX
Subject: FW: Call2Recycle News
Attachments: 2012_Year-End_Press Release_FINAL.doc; 2012 Year-End Press Release - French_FINAL.docx

Follow Up Flag: Follow up
Flag Status: Flagged

From: Orysia Boytchuk [mailto:oboytchuk@call2recycle.ca]
Sent: February-05-13 12:04 PM
To: Lake.MLA, Terry; Paul, Bob A ENV:EX; Ranson, David ENV:EX; Lawes, David ENV:EX; Armstrong, Meegan ENV:EX; Ratcliffe, Julia ENV:EX; Smirl, Lyn ENV:EX; Woodhouse, Christine A ENV:EX; Tyson, Greg ENV:EX
Cc: Joe Zenobio
Subject: Call2Recycle News

Good Afternoon:
I'd like to share some great news about Call2Recycle's battery recycling program. Reporting our 2012 collection results, the attached press releases (English and French) were sent out to North America wide media yesterday. We are happy to announce that our battery collections increased 16% from 2011 and that in Canada alone we collected over one million kilograms of batteries. Call2Recycle looks forward to continuing our success in 2013.

"I'll take batteries for 600, Alex" - TV game show Jeopardy
As an organization we aspire to be knowledge leaders in the marketplace, transcending even batteries to broader issues of the environment and recycling.
We have hit the pinnacle – a few days ago Call2Recycle was a source for a question on Jeopardy.
Here is the link to the video clip on our YouTube channel.

http://youtu.be/Qo4la3B0Q_M

Regards,
Orysia

Orysia Boytchuk
Marketing Director, Call2Recycle®
Recharging the planet. Recycling your batteries.™

416.224-0141 ext 229 1.866.794.7272 | oboytchuk@call2recycle.ca | www.call2recycle.ca


Please consider the environment before printing this email

call2recycle® Recharging the planet. Recycling your batteries.

FOR IMMEDIATE RELEASE

Contact: Linda Gabor
Call2Recycle®
678-218-1082
lgabor@call2recycle.org

Battery Recycling Program Reports Double Digit Collections in 2012

Call2Recycle cites banner year for Canada and California

ATLANTA (February 4, 2013) – North American battery collections increased 16 percent from 2011 to a record 10 million pounds (4.7 million kilograms) in 2012, reported by Call2Recycle, a product stewardship organization managing the only no-cost battery and cellphone collection program in North America.

The organization attributes its success to closing a banner year in California and Canada, both which collected over one million pounds. California became the first state in program history to achieve this milestone. The 11 percent statewide growth came from the municipal and manufacturing sectors, which increased by 23 percent and 24 percent, respectively.

In Canada, Call2Recycle also had a positive year where battery collections grew by 56 percent. The increase can be accredited in part to its program expansion in Quebec, where Call2Recycle was selected by RECYC-QUÉBEC to serve as the official battery recycling program for the province. As of July 2012, Call2Recycle began accepting single-use household batteries for recycling in support of the provincial extended producer responsibility regulation. As a result, 2012 collections in Quebec rose by 357 percent over 2011.

"Our 2012 performance is vitally linked to the support of our program participants, consumers, and key constituents," said Carl Smith, CEO and president of Call2Recycle. "Without their environmental commitment, we would not be able to continue successfully collecting, transporting and recycling the millions of pounds of batteries across the U.S. and Canada."

Call2Recycle offers convenient battery collection sites through a network of over 30,000 retailers, municipalities, businesses and public agencies throughout the U.S. and Canada. To learn more about Call2Recycle or to find a drop-off location near you, visit call2recycle.org, call2recycle.ca or call toll-free 877-2-RECYCLE.

About Call2Recycle®

Call2Recycle is the only no-cost battery and cellphone collection program in North America. Since 1996, Call2Recycle has diverted more than 75 million pounds (34 million kilograms) of batteries from the solid waste stream through its established network of 30,000 collection sites. Advancing green business practices and environmental sustainability, Call2Recycle is the most active voice promoting eco-safe reclamation and recycling of batteries and cell phones. It is the first program of its kind to receive the Responsible Recycling Practices Standard (R2) certification. Learn more at call2recycle.org, call2recycle.ca or 877.723.1297. Become a follower or fan at twitter.com/call2recycle or facebook.com/call2recycle.

DIFFUSION IMMÉDIATE

Forte progression du recyclage de piles en 2012

Année record pour Appel à Recycler au Canada et en California

ATLANTA (4 février 2013) – En 2012, selon Appel à Recycler, l'organisation qui gère le seul programme gratuit de recyclage de piles et de cellulaires en Amérique du Nord, la collecte de piles aux États-Unis et au Canada s'est accrue de 16 pour cent par rapport à 2011, pour atteindre le niveau record de 4,7 millions de kilogrammes.

L'organisation attribue son succès à une année record en Californie et au Canada, qui ont tous deux collecté plus de quatre cent cinquante mille kilos de piles. La Californie est le premier état dans l'histoire du programme à atteindre ce niveau. La croissance de 11 pour cent y est venue des secteurs municipal et manufacturier, qui ont connu une augmentation de 23 pour cent et de 24 pour cent respectivement.

Au Canada, la collecte de piles par Appel à Recycler s'est accrue de 56 pour cent. Cet accroissement peut être crédité en large part à l'expansion du programme au Québec, où Appel à Recycler a été nommé gestionnaire officiel du programme de recyclage de piles de la province par RECYC-QUÉBEC. Depuis juillet 2012, Appel à Recycler accepte les piles domestiques à usage unique, en soutien à la nouvelle réglementation provinciale de responsabilité étendue des producteurs. En conséquence, la collecte au Québec a augmenté de 357 pour cent en 2012 par rapport à 2011.

« Notre performance en 2012 est liée intimement au soutien que nous recevons des participants au programme, des consommateurs et de nos mandants », indique Carl Smith, Président de Appel à Recycler. « Sans leur engagement en faveur de l'environnement, nous ne serions pas en mesure de continuer avec succès à collecter, transporter et recycler des millions de kilogrammes de piles à travers les États-Unis et le Canada ».

Appel à Recycler offre des points de collecte pratiques grâce à son réseau de plus de 30 000 détaillants, municipalités, partenaires commerciaux et agences publiques à travers les États-Unis et le Canada. Pour en savoir plus sur Appel à Recycler ou pour trouver un point de collecte près de vous, visitez www.AppelaRecycler.ca ou appelez le numéro sans frais 866-794-7272.

À propos de Appel à Recycler®

Appel à Recycler® est le seul programme gratuit de collecte de piles et de cellulaires en Amérique du Nord. Depuis 1996, Appel à Recycler a détourné de l'enfouissement plus de 34 millions de kilogrammes de piles à travers son réseau de plus de 30 000 points de collecte. Au service des pratiques commerciales vertes et du développement durable, Appel à Recycler est la voix la plus active de la valorisation et du recyclage des piles et des cellulaires. C'est le premier programme de son type à avoir reçu de l'EPA la certification R2 pour les pratiques responsables de recyclage. Pour en savoir plus, visitez www.AppelaRecycler.ca ou appelez le numéro sans frais 866-794-7272. Vous pouvez aussi nous suivre sur twitter.com/call2recycle ou sur facebook.com/call2recycle.

196939

call2recycle® Recharging the planet. Recycling your batteries.™

June 28, 2013

Honourable Mary Polak, Minister of Environment
Room 325
Parliament Buildings
Victoria, BC
V8W 9E9

Dear Minister Polak:

Congratulations on your recent appointment as the Minister of Environment.

Please allow me to take the opportunity to introduce Call2Recycle Canada, Inc. to you. As you may already be aware, Call2Recycle has been the provincial product stewardship program for household battery collection and recycling in British Columbia since July 1, 2010. We support the efforts of British Columbia to protect environmental values and manage the life cycle of manufactured products, specifically with regard to batteries and cellphones. Working with local and provincial businesses, municipalities, and agencies, our recycling program is a convenient and effective way to divert waste from landfills.

Call2Recycle has been appointed as the agency to meet producer obligations for battery manufacturers, manufacturers whose products contain batteries, and certain distributors and retailers of products as may be appropriate. Under the provincial appointment, Call2Recycle is charged with collecting dry cell batteries weighing less than five (5) kilograms and also supports the cellphone recycling obligations of select producers. Call2Recycle is proud to offer a cost-free service to the public to assist in the province's waste diversion goals.

We look forward to working with you through our continued relationship with the Ministry of Environment.

Sincerely,

Kristen Romilly
Western Canada Manager
Call2Recycle Canada, Inc.

4576 Yonge Street Suite 606 Toronto, ON M2N 6N4 T. 1.888.224.9764 F. 1.866.902.7272 www.call2recycle.ca

BRITISH COLUMBIA

Reference: 196839

SEP 3 0 2013

Kristen Romilly
Western Canada Manager
Call2Recycle Canada, Inc.
606-4576 Yonge Street
Toronto ON M2N 6N4

Dear Ms. Romilly:

Thank you for your letter of June 28, 2013, regarding my appointment as British Columbia's Minister of Environment. I apologize for the delay in responding.

I appreciate your kind words of congratulations. I am enjoying the challenging portfolio as British Columbia's Minister of Environment and look forward to a continued collaborative relationship working together on issues of mutual concern, particularity around the recycling of electronics and electrical products.

Thank you again for taking the time to write.

Sincerely,

Mary Polak

Mary Polak
Minister

Ministry of Environment
Office of the Minister
Mailing Address: Parliament Buildings Victoria BC V8V 1X4
Telephone: 250 387-1187
Facsimile: 250 387-1356

Jonker, Jennifer B ENV:EX

From: Lake.MLA, Terry LASS:EX
Sent: Tuesday, February 5, 2013 1:05 PM
To: Minister, ENV ENV:EX
Subject: FW: Call2Recycle News
Attachments: 2012_Year-End_Press Release_FINAL.doc; 2012 Year-End Press Release - French_FINAL.docx

Follow Up Flag: Follow up
Flag Status: Completed

Kirsty L Morris | Constituency Assistant

Terry Lake, MLA Kamloops - North Thompson
Minister of Environment

Email: kirsty.morris@leg.bc.ca
Phone #: 250-554-5413 Fax #: 250-554-5417
Toll Free #: 1-888-299-0805
Website: www.terrylakemla.bc.ca

THE BC JOBS PLAN

From: Orysia Boytchuk [mailto:oboytchuk@call2recycle.ca]
Sent: February-05-13 12:04 PM
To: Lake.MLA, Terry; Paul, Bob A ENV:EX; Ranson, David ENV:EX; Lawes, David ENV:EX; Armstrong, Meegan ENV:EX; Ratcliffe, Julia ENV:EX; Smirl, Lyn ENV:EX; Woodhouse, Christine A ENV:EX; Tyson, Greg ENV:EX
Cc: Joe Zenobio
Subject: Call2Recycle News

Good Afternoon:
I'd like to share some great news about Call2Recycle's battery recycling program. Reporting our 2012 collection results, the attached press releases (English and French) were sent out to North America wide media yesterday. We are happy to announce that our battery collections increased 16% from 2011 and that in Canada alone we collected over one million kilograms of batteries. Call2Recycle looks forward to continuing our success in 2013.

"I'll take batteries for 600, Alex" - TV game show Jeopardy
As an organization we aspire to be knowledge leaders in the marketplace, transcending even batteries to broader issues of the environment and recycling.
We have hit the pinnacle – a few days ago Call2Recycle was a source for a question on Jeopardy.
Here is the link to the video clip on our YouTube channel.

http://youtu.be/Qo4la3B0Q_M

Regards,
Orysia

Orysia Boytchuk
Marketing Director, Call2Recycle®
Recharging the planet. Recycling your batteries.™

416.224-0141 ext 229 1.866.794.7272 | oboytchuk@call2recycle.ca | www.call2recycle.ca

Please consider the environment before printing this email

call2recycle® Recharging the planet. Recycling your batteries.

FOR IMMEDIATE RELEASE

Contact: Linda Gabor
Call2Recycle®
678-218-1082
lgabor@call2recycle.org

Battery Recycling Program Reports Double Digit Collections in 2012

Call2Recycle cites banner year for Canada and California

ATLANTA (February 4, 2013) – North American battery collections increased 16 percent from 2011 to a record 10 million pounds (4.7 million kilograms) in 2012, reported by Call2Recycle, a product stewardship organization managing the only no-cost battery and cellphone collection program in North America.

The organization attributes its success to closing a banner year in California and Canada, both which collected over one million pounds. California became the first state in program history to achieve this milestone. The 11 percent statewide growth came from the municipal and manufacturing sectors, which increased by 23 percent and 24 percent, respectively.

In Canada, Call2Recycle also had a positive year where battery collections grew by 56 percent. The increase can be accredited in part to its program expansion in Quebec, where Call2Recycle was selected by RECYC-QUÉBEC to serve as the official battery recycling program for the province. As of July 2012, Call2Recycle began accepting single-use household batteries for recycling in support of the provincial extended producer responsibility regulation. As a result, 2012 collections in Quebec rose by 357 percent over 2011.

"Our 2012 performance is vitally linked to the support of our program participants, consumers, and key constituents," said Carl Smith, CEO and president of Call2Recycle. "Without their environmental commitment, we would not be able to continue successfully collecting, transporting and recycling the millions of pounds of batteries across the U.S. and Canada."

Call2Recycle offers convenient battery collection sites through a network of over 30,000 retailers, municipalities, businesses and public agencies throughout the U.S. and Canada. To learn more about Call2Recycle or to find a drop-off location near you, visit call2recycle.org, call2recycle.ca or call toll-free 877-2-RECYCLE.

About Call2Recycle®

Call2Recycle is the only no-cost battery and cellphone collection program in North America. Since 1996, Call2Recycle has diverted more than 75 million pounds (34 million kilograms) of batteries from the solid waste stream through its established network of 30,000 collection sites. Advancing green business practices and environmental sustainability, Call2Recycle is the most active voice promoting eco-safe reclamation and recycling of batteries and cell phones. It is the first program of its kind to receive the Responsible Recycling Practices Standard (R2) certification. Learn more at call2recycle.org, call2recycle.ca or 877.723.1297. Become a follower or fan at twitter.com/call2recycle or facebook.com/call2recycle.

DIFFUSION IMMÉDIATE

Forte progression du recyclage de piles en 2012

Année record pour Appel à Recycler au Canada et en Californie

ATLANTA (4 février 2013) – En 2012, selon Appel à Recycler, l'organisation qui gère le seul programme gratuit de recyclage de piles et de cellulaires en Amérique du Nord, la collecte de piles aux États-Unis et au Canada s'est accrue de 16 pour cent par rapport à 2011, pour atteindre le niveau record de 4,7 millions de kilogrammes.

L'organisation attribue son succès à une année record en Californie et au Canada, qui ont tous deux collecté plus de quatre cent cinquante mille kilos de piles. La Californie est le premier état dans l'histoire du programme à atteindre ce niveau. La croissance de 11 pour cent y est venue des secteurs municipal et manufacturier, qui ont connu une augmentation de 23 pour cent et de 24 pour cent respectivement.

Au Canada, la collecte de piles par Appel à Recycler s'est accrue de 56 pour cent. Cet accroissement peut être crédité en large part à l'expansion du programme au Québec, où Appel à Recycler a été nommé gestionnaire officiel du programme de recyclage de piles de la province par RECYC-QUÉBEC. Depuis juillet 2012, Appel à Recycler accepte les piles domestiques à usage unique, en soutien à la nouvelle réglementation provinciale de responsabilité étendue des producteurs. En conséquence, la collecte au Québec a augmenté de 357 pour cent en 2012 par rapport à 2011.

« Notre performance en 2012 est liée intimement au soutien que nous recevons des participants au programme, des consommateurs et de nos mandants », indique Carl Smith, Président de Appel à Recycler. « Sans leur engagement en faveur de l'environnement, nous ne serions pas en mesure de continuer avec succès à collecter, transporter et recycler des millions de kilogrammes de piles à travers les États-Unis et le Canada ».

Appel à Recycler offre des points de collecte pratiques grâce à son réseau de plus de 30 000 détaillants, municipalités, partenaires commerciaux et agences publiques à travers les États-Unis et le Canada. Pour en savoir plus sur Appel à Recycler ou pour trouver un point de collecte près de vous, visitez www.AppelaRecycler.ca ou appelez le numéro sans frais 866-794-7272.

À propos de Appel à Recycler®

Appel à Recycler® est le seul programme gratuit de collecte de piles et de cellulaires en Amérique du Nord. Depuis 1996, Appel à Recycler a détourné de l'enfouissement plus de 34 millions de kilogrammes de piles à travers son réseau de plus de 30 000 points de collecte. Au service des pratiques commerciales vertes et du développement durable, Appel à Recycler est la voix la plus active de la valorisation et du recyclage des piles et des cellulaires. C'est le premier programme de son type à avoir reçu de l'EPA la certification R2 pour les pratiques responsables de recyclage. Pour en savoir plus, visitez www.AppelaRecycler.ca ou appelez le numéro sans frais 866-794-7272. Vous pouvez aussi nous suivre sur twitter.com/call2recycle ou sur facebook.com/call2recycle.

Jonker, Jennifer B ENV:EX

From: WDO Stakeholder Communications [wdostakeholdercommunications=wdo.ca@mail8.atl31.mcdlv.net] on behalf of WDO Stakeholder Communications [wdostakeholdercommunications@wdo.ca]
Sent: Friday, December 20, 2013 9:48 AM
To: Minister, ENV ENV:EX
Subject: Industry Stewardship Plan (ISP) Update

December 20, 2013

Good afternoon.

For an update on the four ISPs currently being evaluated by WDO, please click here.

This update includes a link to the Call2Recycle ISP Summary Document with stakeholder comments and Call2Recycle's responses.

Please be reminded that we continue to seek feedback on the Transition Plan Guide and one-window municipal reporting, as noted in the ISP Update.

Thank you for your participation to date in our ISP consultations.

Sincerely,
WDO Stakeholder Communications

Waste Diversion Ontario
Our mailing address is:
Waste Diversion Ontario
4711 Yonge Street
Suite 1102
Toronto, ON M2N 6K8
Canada

RECHARGING THE PLANET.
RECYCLING YOUR BATTERIES.™

call2recycle®

Call2Recycle

Rechargeable and Alkaline Batteries Recycling

Kristen Romilly
Western Canada Account Manager

call2recycle.ca

About Call2Recycle

- Voluntary Program
- Not-for-Profit Service Organization; 100% Funded by approximately 200 Battery & Product Manufacturers
- Collects Rechargeable Batteries and Cell Phones in all jurisdictions in North America & also Single Use Batteries in BC and Manitoba
- Free Program - 4 collection channels: Retail, Municipalities, Businesses, and Institutions.
- Manages the BC all Battery Program on behalf of our Licensees/Stewards in BC which launched on July 1, 2010.
- Canadian Management and Board.

Collection System and Collection Targets

Process Flow: Canada

COLLECTION

Public Agencies
Retailers
Businesses
Municipalities

SORTING

Recording and sorting by chemistry

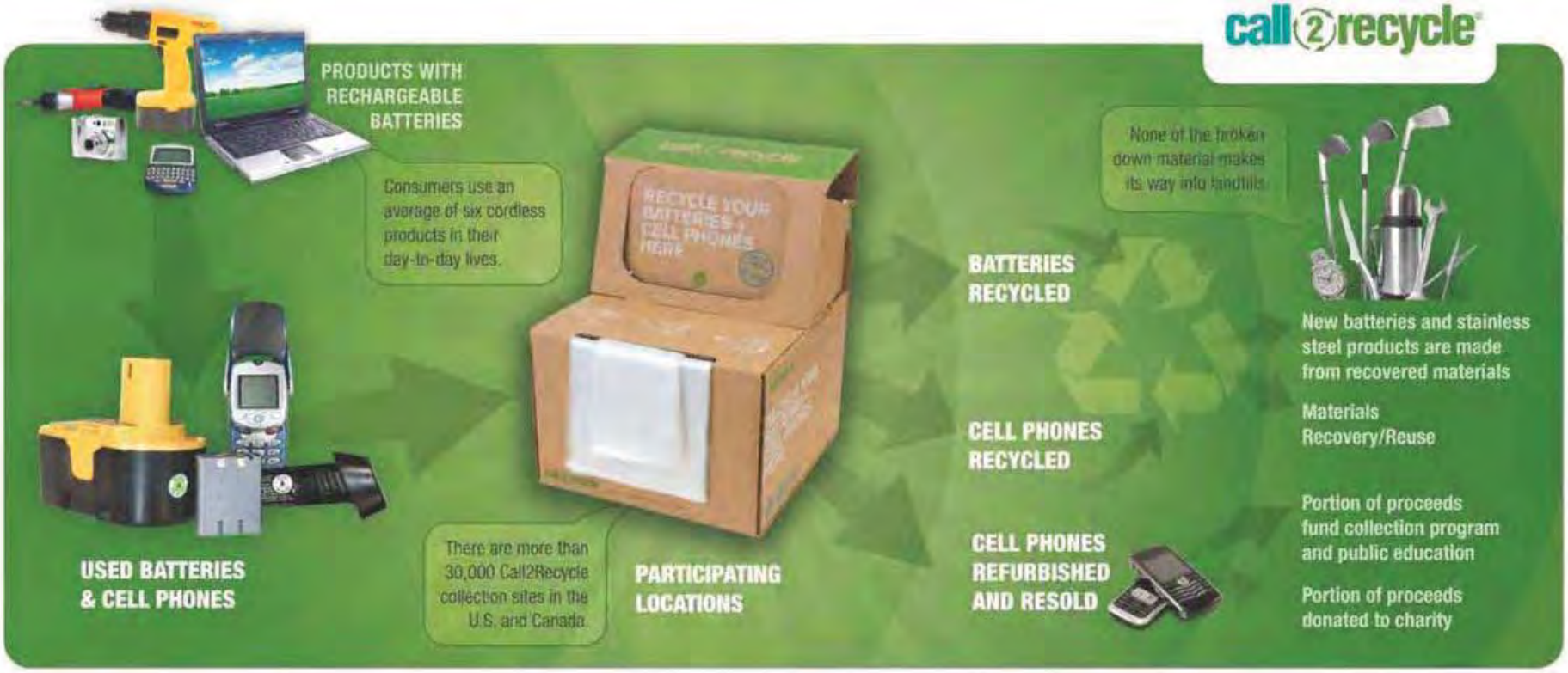
WESTERN CANADA	EASTERN CANADA
TOXCO *Trail, BC*	NEWALTA *Fl Erie, ON*

PROCESS & RECOVERY

Processed by chemistry type

Li-ion Batteries	SSLA/Pb Dry Cell Batteries	Ni-Cd, Ni-MH, Ni-Zn, and Single-use Batteries	Lithium Primary	Cell Phones
Western Canada: TOXCO, Trail, BC Eastern Canada: Xstrata, Sudbury, ON	NEWALTA, Ville Ste-Catherine, QC	INMETCO, Ellwood City, PA, USA	Western Canada: TOXCO, Trail, BC Eastern Canada: INMETCO, Ellwood City, PA, USA	THE WIRELESS ALLIANCE, Boulder, CO, USA
COBALT RECOVERED	LEAD RECOVERED	NICKEL-IRON STAINLESS STEEL & CADMIUM RECOVERED	LITHIUM RECOVERED	METALS RECOVERED OR REFURBISHED/RESOLD PROCEEDS TO CHARITIES

Recovery


call2recycle
PRODUCTS WITH RECHARGEABLE BATTERIES
Consumers use an average of six cordless products in their day-to-day lives.
USED BATTERIES & CELL PHONES
There are more than 30,000 Call2Recycle collection sites in the U.S. and Canada.
PARTICIPATING LOCATIONS
BATTERIES RECYCLED
CELL PHONES RECYCLED
CELL PHONES REFURBISHED AND RESOLD
None of the broken down material makes its way into landfills.
New batteries and stainless steel products are made from recovered materials
Materials Recovery/Reuse
Portion of proceeds fund collection program and public education
Portion of proceeds donated to charity

Downstream Tracking

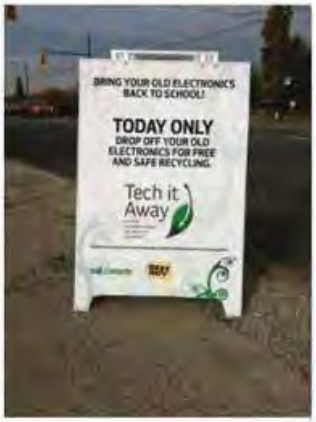
- Manager dedicated to Safety and Compliance
- 3rd party audits of downstream facilities.
- Monitor and obtain copies of facility permits, certifications, insurance, internal audits.
- Complete downstream tracking of shipments to end processors- BOL, manifests, receipt acknowledgement, certificates of recycling, and recycling efficiencies.
- Program has completed phase 2 audit for R2 certification
- Operate in accordance with e-steward qualification standards, and we work with Recycler Qualification Programs in Canada.
- For more information see our 2010 Annual Report on call2recycle.ca

Consumer Access

- Over 1,200 collection sites
- Businesses, recycling depots, and municipalities.
- Partnerships with Retailers
- Community Activities
- Community Drop-Off Sites

Consumer Awareness

- Media Partnership with Shell Busey
- British Columbia's Recycling Manual
- Retailers Program Promotion
- Newspaper Inserts Vancouver Sun and The Times Columnist



Contact

Kristen Romilly
Western Canada Account Manager
Call2Recycle
1-866-794-7275 ext.228
kromilly@call2recycle.ca

January 5, 2012 - RE: Media Request: Bullets for The Province on battery recycling...

Subject	**RE: Media Request: Bullets for The Province on battery recycling...**
From	Dalal, Suntanu GCPE:EX
To	Lawes, David ENV:EX
Cc	Woodhouse, Christine A ENV:EX; Johnston, Karen GCPE:EX
Sent	Thursday, January 5, 2012 11:42 AM

In addition to bullets specific to this request, we'll probably also want a couple of bullets highlighting recent new recycling programs in B.C., as well as a bullet or two on how B.C. is a leader in Extended Producer Responsibility programs/recycling.

From: Dalal, Suntanu GCPE:EX
Sent: Thursday, January 5, 2012 11:32 AM
To: Lawes, David ENV:EX
Cc: Woodhouse, Christine A ENV:EX; Johnston, Karen GCPE:EX
Subject: Media Request: Bullets for The Province on battery recycling...

Hi David,

As discussed, the reporter wants to speak to someone (we'll propose the Minister) about the success of battery recycling in B.C. The reporter is also hoping to speak to the West Coast and Toronto-based reps of Call2Recycle.

I've attached the news release that went out at the time B.C.'s program was announced.

Please note that the reporter wants to speak to someone before 4 p.m. today.

Thanks,
Suntanu

Media Alert: Call2Recycle® and British Columbia Ministry of Environment Launch North America's First Recycling Program for All Household Batteries

VANCOUVER, June 4, 2010 –
Who: The Honourable John Yap, British Columbia Minister of State for Climate Action; Carl Smith, president and CEO of Call2Recycle®, the only free rechargeable battery and cell phone collection program in North America, operating in British Columbia since 1997; and Shell Busey of the HouseSmart Referral Network.
What: The British Columbia Ministry of the Environment and Call2Recycle will celebrate the launch of North America's first government-mandated recycling program for all household batteries. Call2Recycle will leverage its relationships with 1,500 collection locations comprised of retailers, public agencies, municipalities and other businesses to expand the program.
When: June 8, 2010 at 2:30 p.m.
Where: Stanley Park Dining Pavilion, Vancouver (located in Vancouver's Stanley Park between the Malkin Bowl and the Miniature Railway Plaza). For directions, click here.
About Call2Recycle
Call2Recycle® is the only free battery and cell phone collection program in North America. Since 1994, Call2Recycle has diverted more than 25 million kilograms of rechargeable batteries from local landfills and established a network of 30,000 recycling drop-off locations. Advancing green business practices and environmental sustainability, Call2Recycle is the most active voice promoting eco-safe reclamation and recycling of rechargeable batteries and cell phones. Call2Recycle is operated by the non-profit Rechargeable Battery Recycling Corporation (RBRC). Learn more at call2recycle.ca or 877.2.RECYCLE. Follow at twitter.com/call2recycle.

From: Luba, Frank (The Province) [mailto:FLuba@theprovince.com]
Sent: Thursday, January 5, 2012 11:21 AM
To: Dalal, Suntanu GCPE:EX
Subject: FW: Consumers recycling more batteries - Call2Recycle sees 13.1% increase in collections

I am looking for someone to comment on the success of the battery recycling program in BC.
thanks

FRANK LUBA
Reporter
The Province
Suite 1 – 200, Granville St.
Vancouver, B.C. V6C 3N3
Office: 604.605.2070
Mobile: 604.250.6157
Email: fluba@theprovince.com

The Province
theprovince.com

From: news@meltwaterpress.com [mailto:news@meltwaterpress.com]
Sent: Thursday, January 05, 2012 5:04 AM
To: Luba, Frank (The Province)
Subject: Consumers recycling more batteries - Call2Recycle sees 13.1% increase in collections

call2recycle®

FOR IMMEDIATE RELEASE

CONSUMERS RECYCLING MORE BATTERIES IN 2011

Call2Recycle's Battery Collections Surge 13.1%

ATLANTA (January 5, 2012) – More and more consumers are recycling their batteries according to Call2Recycle®, the North American leader in

consumer battery recycling. Today it announced a 13.1 percent increase in 2011 battery collections (over 2010), collecting more than 7.6 million pounds (3.45 million kilograms) of rechargeable batteries (the equivalent to the weight of 278 school buses) through a network of over 30,000 retail, business and municipal locations throughout the United States and Canada.

In the United States, Illinois, Pennsylvania and Texas experienced strong growth in rechargeable battery collections in 2011, while Georgia, Mississippi and Colorado collected fewer batteries in 2011 than 2010. Within those states, all sectors grew, but the municipality sector outpaced the retail and business sectors growing by 37 percent as compared with 2010.

Canada increased overall collections (rechargeable and primary) by 17 percent and 157 percent respectively. British Columbia's all-battery program achieved an amazing upsurge of 150 percent over 2010 collections and Manitoba experienced an even greater increase – 211 percent.

In both the United States and Canada, healthcare, e-waste and the home improvement markets continued to see significant increases in collections.

"We continue to focus on encouraging more consumers to recycle batteries so that we can limit the amount of virgin natural resources necessary to manufacture new ones," said Carl Smith, CEO of Call2Recycle. "We are very pleased with our growth of collections, but we also know that we have much more to do before we can claim success."

About Call2Recycle®
Call2Recycle is the only free battery and cell phone collection program in North America. Since 1994, Call2Recycle has diverted more than 70 million pounds (32 million kilograms) of rechargeable batteries from local landfills and established a network of 30,000 recycling drop-off locations. Advancing green business practices and environmental sustainability, Call2Recycle is the most active voice promoting eco-safe reclamation and recycling of rechargeable batteries and cell phones. Learn more at call2recycle.org, call2recycle.ca or 877.723.129. Become a follower or fan at twitter.com/call2recycle or facebook.com/call2recycle.

###

Contact: Jennifer Childress

Call2Recycle®

678-218-4580

jchildress@call2recycle.org

April 30, 2012 - final draft batteries

Subject	**final draft batteries**
From	Clarissa Morawski
To	Tyson, Greg ENV:EX
Sent	Monday, April 30, 2012 9:28 AM
Attachments	Waste Batteries-...

Greg,

FYI – here is a draft copy of the battery report.
It is on its way to layout – and I am getting some comments back from a few key stakeholders right now – Final version should be out by the end of the week.

Talk to you tomorrow.
C.

CM CONSULTING

cmconsultinginc.com

Managing Canada's Waste Batteries

2012

A Primer [h1]

Battery recycling in Canada is happening today. In fact, mandated programs are running in British Columbia and Manitoba for all portable battery types and in Ontario for primary batteries. Quebec is also commencing a new program for all portable batteries on July 1, 2012. In addition to these new programs, long-running voluntary rechargeable collection initiatives offered by the Rechargeable Battery Recycling Corporation continue to operate throughout Canada.

Compared to other waste products collected through stewardship programs in Canada, batteries have yielded little data. The *Battery Recycling in Canada 2009 Update*, produced by Kelleher Environmental (http://www.kelleherenvironmental.com/) for Environment Canada and Natural Resources Canada, contains the most comprehensive data set, systems summaries, and trending analysis available on the subject. Kelleher's work has established a baseline data set that enables a more informed review of the new program data. It also offers the tools to facilitate quantification of upstream energy and avoided greenhouse gas emissions from metal and element recovery in the battery recycling process. Finally, Kelleher's report is still the best available data on programs in which public reporting is not currently required for portable primary and/or secondary batteries.

In this first edition of ***Managing Canada's Waste Batteries***, we aim to report on, clarify, and offer insight into the new battery collection and recycling programs in Canada. Program data from British Columbia (2010), Manitoba (2011), and Ontario (2010 & 2011) are presented together, and clarification is offered on definitions of recovery and recycling rates being reported, what they include and exclude, and how they relate to program performance.

The subject of waste batteries is extremely complex given the varieties and chemistries, types of use, and end-of-life impact that batteries have. With the introduction of the new battery recycling programs in Canada, this report is timely. ***Managing Canada's Waste Batteries*** is our response to the need for transparency, data scrutiny, and clarity on this important subject, so it is designed for use by businesses, governments, members of the public, and the media. Our research and reporting is ongoing.

Changes, Challenges, and Opportunities [h1]

By the end of this summer, more than two thirds of Canadians (those in BC, MB, ON, QB) will have mandatory collection and recycling programs for primary portable batteries. Three of these provinces (BC, MB, QB) also mandate the recycling of rechargeable batteries.

Data availability on batteries is limited. Mandated programs, which are required to provide annual reports, do quantify estimates for sales and collection. But these reports are inconsistent with each other; they derive sales using different methodologies, and may lack third-party oversight and detail.

Further challenges with data come from a rapidly changing marketplace for single and especially rechargeables batteries. Our best available estimates for national sales data in 2011 are derived from Kelleher (2009), which used trending information available at the time to attempt to predict the unpredictable. When that report was written, no one could have foreseen the significant growth of hand-held devices.

Canada is fortunate that it has recycling capacity for all battery types available in both Canada and the United States. These recycling industries are making investments to continue to improve and expand their capacity to recycle batteries.

Increased battery use by Canadians, combined with investments in new collection channels and recycling infrastructure, offers tremendous opportunity for battery diversion and recovery.

These new programs offer fresh education efforts that will encourage more people to recycle their batteries instead of disposing them in garbage. Some of these programs also offer financial collection incentives to help evolve a more convenient and effective collection network.

I trust you will find this report to be informative in your efforts. Please do not hesitate to contact me if you require other data or further analysis.

Respectfully yours,

Clarissa Morawski
Principal

CM CONSULTING

Methods Used in This Report [h2]

This study is based on secondary research. This means evaluating existing authoritative literature, government-sponsored studies, and industry reports. Evaluating the sources within the scope of this study also includes assessing the transparency and certainty of data in order to present the study as objectively as possible on the basis of compatible results. In addition, experts and system operators were interviewed, and discussions were held with stakeholders with a view to validating work results.

In particular, this study relies heavily on the information contained in the following sources:

Resources researched for this report [h3]

Unit weight measurements [h4]

1) Kelleher Environmental, *Battery Recycling Update in Canada 2009 Update*.

Sales data [h4]

2) Kelleher Environmental, *Battery Recycling Update in Canada 2009 Update*. Estimated sales and available for collection figures for 2011.
3) Call2Recycle®, *2010 Annual Report to the Ministry of the Environment for the Province of British Columbia*.
4) Stewardship Ontario, *2010 Stewardship Ontario Annual Report* and 2011 data from SO.

Specific battery chemistry: History, advantages, properties, toxicological concerns, and common applications[h4]

5) Estimated sales from Kelleher Environmental, *Battery Recycling Update in Canada 2009 Update*.
6) http://www.batteryfacts.co.uk/BatteryTypes/index.html
7) http://www.fusionteq.com/html/battery_101_-_the_basics.html
8) http://www.powerstream.com/BatteryFAQ.html
9) http://electronics.howstuffworks.com/everyday-tech/lithium-ion-battery.htm
10) http://www.tumblr.com/tagged/how+do+zinc+carbon+batteries+work
11) http://www.wisegeek.com/what-is-a-zinc-carbon-battery.htm
12) http://www.doitpoms.ac.uk/tlplib/batteries/batteries_zn_c.php
13) http://www.baj.or.jp/e/knowledge/structure.html
14) http://electrochem.cwru.edu/encycl/art-b02-batt-nonr.htm
15) http://www.gravitaexim.com/Battery-Recycling/Battery-History.html
16) http://science.howstuffworks.com/electric-battery-info1.htm
17) http://www.duracell.com/media/en-US/pdf/gtcl/Technical_Bulletins/Zinc%20Air%20Tech%20Bulletin.pdf
18) http://batteryuniversity.com/

Recycling performance metrics [h4]

19) PSI – *Battery Performance Metrics: Recommendations for Best Practices.*
20) Kelleher Environmental, *Battery Recycling Update in Canada 2009 Update.*
21) Consortium ESWI, *Study on the Calculation of Recycling Efficiencies and Implementation of Export Article (Art. 15) of the Batteries Directive 2006/66/EC.*

Life cycle assessment [h4]

22) *Life Cycle Impacts of Alkaline Batteries with a Focus on End-of-Life*, For NEMA, by MIT: E. Olivetti, J. Gregory, et al. February, 2011.
23) *A Review of Battery Life-Cycle Analysis State of Knowledge and Critical Needs*, Argonne National Laboratory, J.L. Sullivan, L. Gaines. October 2010.
24) A review of technologies for the recovery of metals from spent alkaline and zinc-carbon batteries. E. Sayilgan et al. / *Hydrometallurgy* 97. 158–166. 2009.
25) *Battery Waste Management Life Cycle Assessment, Final Report for Publication*, DEFRA, October 2006.

Processing [h4]

26) Kelleher Environmental, *Battery Recycling Update in Canada 2009 Update.*
27) Call2Recycle®, *2010 Annual Report to the Ministry of the Environment for the province of British Columbia.*
28) Stewardship Ontario list of approved Battery Incentive Program processors. http://www.stewardshipontario.ca/sites/default/files/BIP-Processor%20April%202%202012.pdf

Battery composition materials: Toxicology [h4]

29) Agency for Toxic Substances and Disease Registry
30) Environment Canada list of toxic substances managed under CEPA (*Canadian Environmental Protection Act, 1999)*

Table of Contents

Ontario

Municipal Hazardous or Special Waste Program

Collection Networks

Battery Recyclers for Canadian Collection Programs

Battery Composition Materials: Toxicology

Manganese (Mn)

Zinc (Zn)

Nickel (Ni)

Cadmium (Cd)

Cobalt (Co)

Lithium

Aluminum (Al)

Lead (Pb)

Silver (Ag)

Mercury (Hg)

Alkali

Sulfuric Acid (H_2SO_4)

Closing Note

LIST OF TABLES

List of Figures

Abbreviations [h3]

Ag	Silver
AgO	Silver oxide
Al	Aluminum
AlMn	Alkaline manganese
BIP	Battery Incentive Program
BPI	Battery Program Incentive
BRI	Battery Recovery Incentive
C2R	Call2Recycle®
Cd	Cadmium
CEPA	*Canadian Environmental Protection Act*
Co	Cobalt
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DHHS	Department of Health and Human Services
EC	Environment Canada
EFW	Energy from waste
EPA	U. S. Environmental Protection Agency
EU	European Union
Fe	Iron
H_2SO_4	Sulfur
Hg	Mercury
HgO	Mercury oxide
IARC	International Agency for Research on Cancer
IFO	Industry-funded organization
LCA	Life cycle assessment
Li	Lithium
Li	Lithium
Li-ion	Lithium ion
LiMn	Lithium manganese
MHSW	Municipal household special waste
MIT	Michigan Institute of Technology
Mn	Manganese
MnO	Alkaline manganese
NEMA	National Electrical Manufacturers Association
Ni	Nickel
NiCd	Nickel cadmium
NiMH	Nickel metal hydride
Pb	Lead
PbA	Lead acid
PSI	Product Stewardship Institute

RBRCC	Rechargeable Battery Recycling Corporation of Canada
RER	Recycling efficiency rate
RMC	Raw Materials Company
SO	Stewardship Ontario
SSLA	Small sealed lead acid
Zn	Zinc
ZnC	Zinc carbon

Unit-to-weight standard measurements: Tonnage to unit conversions [h3]

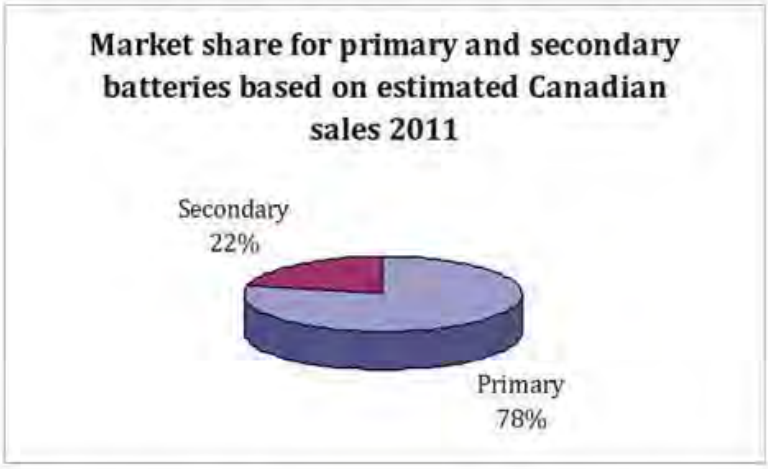
To determine the number of units sold and units available for collection, it is necessary to estimate a unit weight of each battery type in grams. The Kelleher report calculates unit weights utilizing European data to create a range of weights by battery chemistry.

PRIMARY	UNIT WEIGHT (grams)	UNIT WEIGHT RANGE (grams)
Zinc carbon (ZnC)	27	27–28
Alkaline ($ZnMnO_2$)	28	26–32
Zinc air (ZnO_2)	33	33
Lithium (primary)	16	
Zinc air button cell (ZnO_2)	0.9	
Silver oxide button ($ZnAgO_2$)	1.2	.12 - 2.5

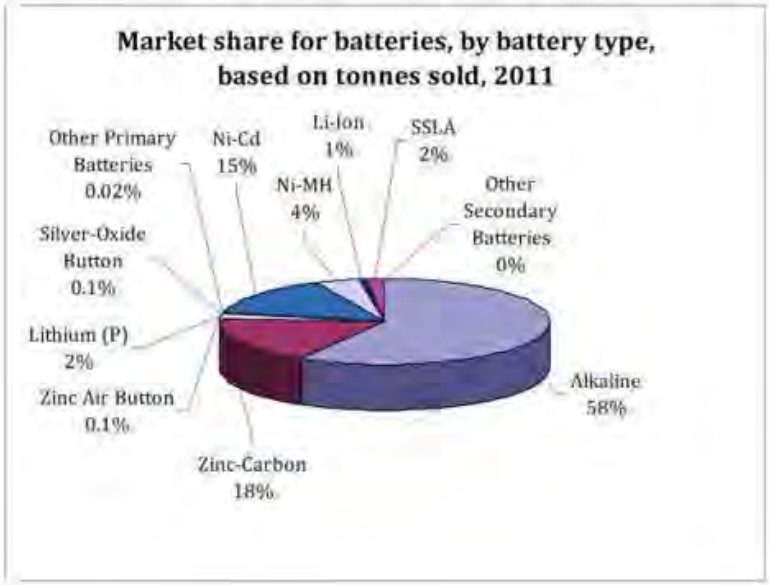
SECONDARY	UNIT WEIGHT (grams)	UNIT WEIGHT RANGE (grams)
Nickel cadmium (NiCd)	203	11–450
Nickel metal hydride (NiMH)	93	9–178
Lithium ion (Li-ion)	40	11–75
Lithium polymer (Li-poly)	40	11–75
Small sealed lead acid (SSLA)	1045	1015–1075

Canadian Market Share of Primary and Secondary Portable Batteries [h1]

Statistics for Canadian battery sales are estimated Canadian sales for 2011 from *Battery Recycling in Canada 2009 Update*, submitted to Environment Canada and Natural Resources Canada by Kelleher Environmental. According to the report, primary batteries make up 78% of total sales, by weight, in the country.



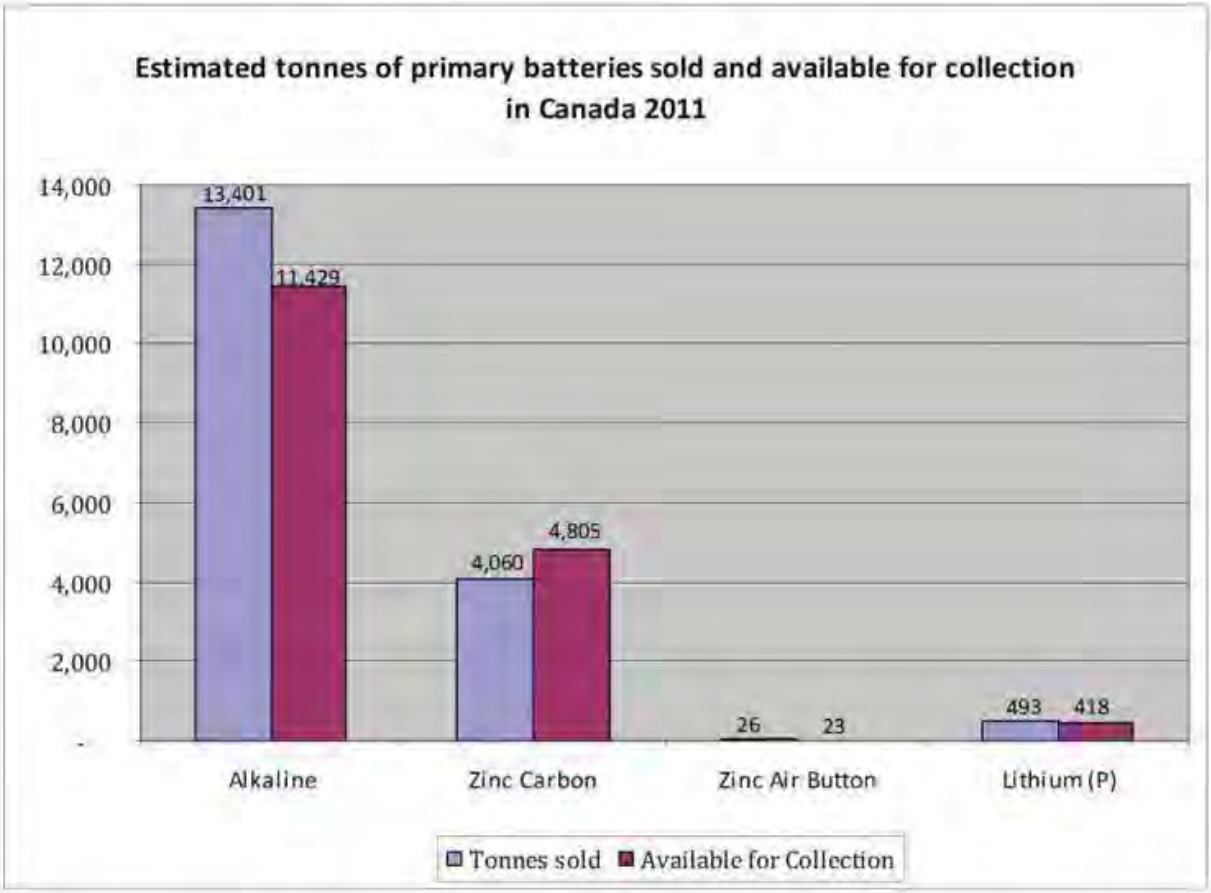
The most common battery chemistry in Canada (on a weight basis) is the alkaline cell, which makes up 58% of the total market. After alkaline, the zinc carbon battery (also primary) is the most common at 18%, followed by the nickel cadmium (rechargeable) at 14%, and the nickel metal hydride (rechargeable) at 4%. Lithium primary batteries and small sealed lead acid batteries (rechargeable) each represent 2% and lithium ion 1% of the total market. Silver oxide button cell, zinc air button cell, other primary batteries, and other secondary batteries combined make up less than 1% of the total market.



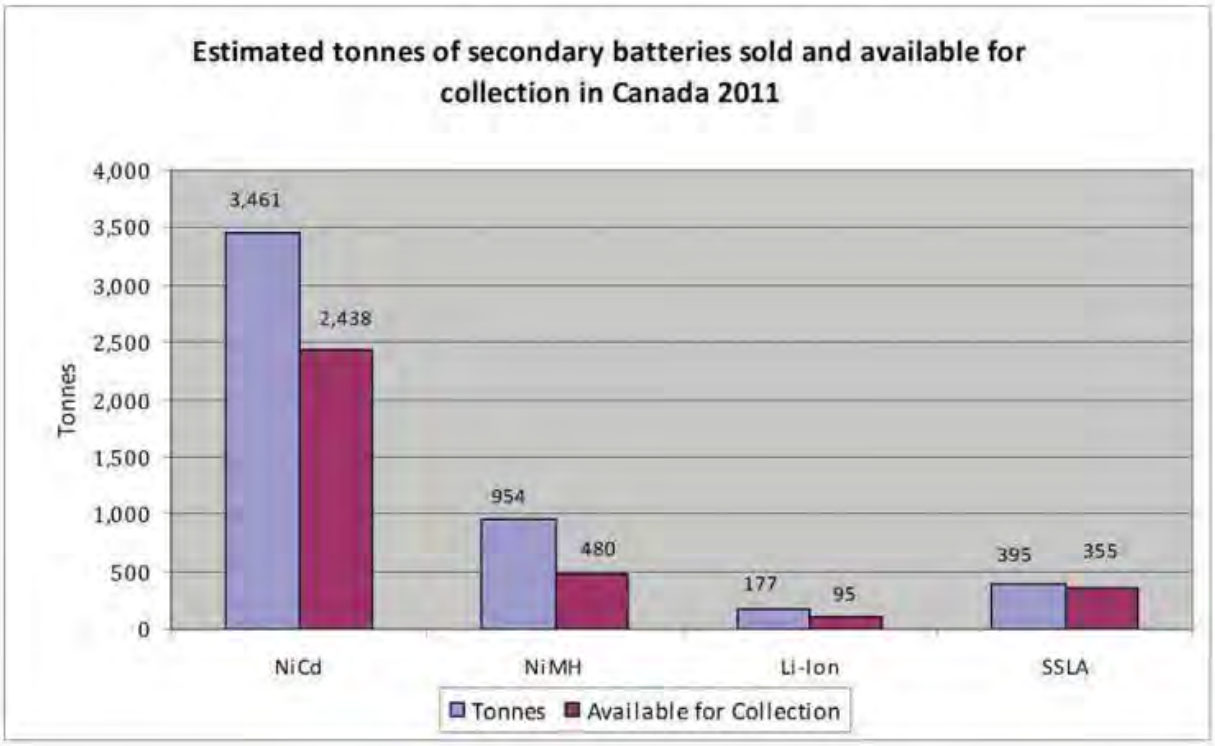
Canadian Sales and Available for Collection of Primary Batteries [h1]

A battery sold in 2011 is not likely to reach end of life in 2011. All batteries have a lifespan, and many are hoarded for a period of time after their useful life. The Kelleher report developed a model to ascertain the number of batteries "available for collection" or disposal at end of life.

In 2011, the available for collection figure for alkaline batteries is roughly 15% lower than sales for the same year. Zinc carbon batteries, on the other hand, are seeing sales diminish so rapidly that the available for collection number is 18% *higher* than sales for 2011.



Secondary or rechargeable batteries have a longer lifespan and probably a greater hoarding rate. On average, the 2011 available for collection number is 32% lower than the number sold in 2011, assuming a 5-year hoarding rate.


Estimated tonnes of secondary batteries sold and available for collection in Canada 2011
Tonnes
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
3,461
2,438
954
480
177
95
395
355
NiCd
NiMH
Li-Ion
SSLA
Tonnes
Available for Collection

Profiles: Primary or Single Use Portable Batteries [h1]

Alkaline [h2]

Sales: Alkaline batteries are by far the dominant battery on the market. By weight, alkaline batteries comprise 58% of all batteries sold. With sales of zinc carbon batteries dropping, alkaline batteries will continue to constitute the largest portion of the batteries recovered by collectors and processors.

Estimated Canadian sales in units 2011:	480,746,000 units
Estimated Canadian sales in tonnes 2011:	13,461 tonnes
Estimated Canadian tonnes available for collection 2011:	11,429 tonnes

History: Alkaline battery chemistry was first introduced in the early 1960s, and this battery has become the most popular type for consumer use. The alkaline cell gets its name because it uses alkaline aqueous solutions as electrolytes.

Advantages: Alkaline batteries are 8 to 10 times more powerful than zinc carbon batteries and have a longer shelf life (alkaline batteries can deliver up to 80% of their original capacity after being stored for 4 years). They also have greater leakage resistance. Alkaline cells operate over a wider temperature range at high discharge rates.

Properties: Alkaline cells have an anode of zinc powder, a cathode of manganese dioxide (MnO_2) powder, and use potassium hydroxide for an electrolyte. Component materials of alkaline batteries are steel, zinc, manganese, nickel, other metals, alkali, water, and other non-metals.

	Fe/steel	Zn	Mn	Ni	other metals	alkali	water	other non-metals	plastic/paper/ carbon
Alkaline	24.8%	14.9%	22.3%	0.5%	1.3%	5.4%	10.1%	14%	6.9%

Toxicological concerns: In 2011, alkaline batteries sold into Canada contained 1,997 tonnes of zinc, 2,988 tonnes of manganese, 67 tonnes of nickel, 724 tonnes of alkali, and some amount of copper.

Common applications: These batteries are used in portable televisions and radios, toys, flashlights, and for photoflash and other high-drain applications.

Zinc Carbon [h2]

Sales of zinc carbon batteries are decreasing as alkaline batteries become an even more dominant player in the primary battery market.

Estimated Canadian sales in units 2011:	150,375,000 units
Estimated Canadian sales in tonnes 2011:	4,060 tonnes
Estimated Canadian tonnes available for collection 2011:	4,805 tonnes

History: The zinc carbon cell is based on the very first batteries created in the late 1800s. In 1886, a "dry" version of the wet Leclanche cell was patented by Dr. Carl Gassner. This cell used a zinc cup as the anode and a plaster of Paris mixture as the electrolyte. These dry cells really gained popularity after being introduced at the 1900 World's Fair in Paris by Gassner. Improvements throughout the century, such as using purer zinc or better sealing, gave the cell a fourfold increase in capacity by 2000.

Advantages: The zinc carbon cell is very inexpensive compared to other types of cells.

Properties: Zinc carbon cells have an anode of zinc chloride and a cathode that is a paste of manganese dioxide and carbon powder (usually graphite powder). Component materials of zinc carbon batteries are steel, lead, zinc, manganese, other metals, alkali, water, and other non-metals.

	Fe/steel	Pb	Zn	Mn	other metals	alkali	water	other non-metals	plastic/paper/ carbon
Zinc carbon (ZnC)	16.8%	0.1%	19.4%	15%	0.8%	6%	12.3%	15%	13.9%

Toxicological concerns: In 2011, zinc carbon batteries sold into Canada contained 4 tonnes of lead, 788 tonnes of zinc, 609 tonnes of manganese, and 244 tonnes of alkali.

Common applications: These batteries are used in small portable electronic devices that require a low to moderate level of power, such as flashlights.

Lithium [h2]

Lithium primary batteries make up only 2% of the total battery market, but sales are growing.

Estimated Canadian sales in units 2011:	30,829,000 units
Estimated Canadian sales in tonnes 2011:	493 tonnes
Estimated Canadian tonnes available for collection 2011:	418 tonnes

History: Early forms of the lithium battery were being used in the United States as early as the late 1950s, but it was not until the 1970s that the Matsushita Battery Industrial Co., Ltd. (currently Panasonic Energy) began to mass produce this chemistry for commercial purposes.

Advantages: The lithium cell uses inexpensive materials and has a high energy density for low volume by weight and mass. The battery also has very low self-discharge characteristics, allowing it to have an excellent lifespan compared to other primary battery chemistries.

Properties: A typical consumer lithium cell uses metallic lithium as an anode and manganese dioxide for the cathode. The electrolyte is lithium dissolved in an organic solvent. Component materials of lithium primary batteries are steel, nickel, manganese, lithium, and non-metals.

	Fe/steel	Mn	Ni	Li	other non-metals	plastic/ paper/ carbon
Lithium (P)	50.0%	19.0%	1.0%	2.0%	19%	9.0%

Toxicological concerns: In 2011, lithium primary batteries sold into Canada contained 10 tonnes of lithium, 94 tonnes of manganese, and 5 tonnes of nickel.

Common applications: These include digital wristwatches, headlamps, LED lights, smoke detectors, and wireless alarm systems.

Silver Oxide Button Cells [h2]

Estimated Canadian sales in units 2011:	11,334,000 units
Estimated Canadian sales in tonnes 2011:	14 tonnes
Estimated Canadian tonnes available for collection 2011:	13 Tonnes

History: Silver oxide button cells were first available on the commercial market in 1960. The battery became the battery of choice for quartz watches, and the market grew during the 1970s as these watches dominated the market. The pocket calculator also made use of the silver oxide button cell. When the value of silver rose sharply in the late 1970s, use of this type of battery dropped and use of the coin-type lithium battery grew.

Advantages: These batteries have a very high energy/weight ratio. However, they are costly due to the high price of silver.

Properties: The cathode (positive electrode) is composed of silver dioxide. The negative electrode (the anode) is powdered zinc. The zinc makes up the top layer of the battery itself. The electrode materials and the separator are infused with an alkaline electrolyte.

The component materials of the silver oxide button cell battery are steel, zinc, manganese, nickel, silver, mercury, other metals, alkali, water, and other non-metals.

	Fe/steel	Zn	Mn	Ni	Ag	Hg	other metals	alkali	water	other non-metals	plastic/ paper/ carbon
Silver oxide button cell	42%	9%	2%	2%	31%	0.4%	4%	1%	2%	4%	2.5%

Toxicological concerns: In 2011, silver oxide button cell batteries sold into Canada contained .05 tonnes of mercury, 1.1 tonnes of zinc, 4 tonnes of silver, and less than 1 tonne of manganese, nickel, and other metals.

Common applications: Two types of silver oxide batteries are available, one type with a sodium hydroxide (NaOH) electrolyte and the other with a potassium hydroxide (KOH) electrolyte. Sodium hydroxide types last 2 to 3 years, making them highly suitable for quartz analogue digital watches or digital watches without backlights. Potassium hydroxide types are better for the short bursts of higher current drains that are required from LCD watches with backlights. Hearing aids and electronic measuring instruments also use batteries with a potassium hydroxide electrolyte in combination with a special separator to match the application.

Zinc Air Button Cells [h2]

Estimated Canadian sales in units 2011:	29,088,000 units
Estimated Canadian sales in tonnes 2011:	26 tonnes
Estimated Canadian tonnes available for collection 2011:	23 tonnes

History: Mass production of button-type zinc air batteries began in the 1980s.

Advantages: Small and lightweight, zinc air button cells have a higher capacity-to-volume (and weight) ratio than other types of battery because air from the atmosphere is one of the battery reactants.

Properties: The anode in a zinc air cell is a powdered zinc amalgam. The zinc powder contains a very low level of mercury (max. 25 mg per cell). The air cathode in a zinc air cell is a mixture of carbon, Teflon, and a small amount of manganese dioxide impressed onto a nickel-plated screen. The electrolyte is an aqueous solution of potassium hydroxide with a small amount of zinc oxide to prevent self-discharge of the anode. (Note: electrolyte form is specific to a Duracell® zinc air button.)

The component materials are steel, zinc, mercury, other metals (at least for the Duracell® model described above), alkali, water, and other non-metals.

	Fe/steel	Zn	Hg	alkali	water	other non-metals	plastic/ paper/ carbon
Zinc air button cell	42%	35%	1%	4%	10%	3%	5%

Toxicological concerns: In 2011, zinc air button cell batteries sold into Canada contained .03 tonnes of mercury, 9 tonnes of zinc, and 1 tonne of alkali.

Common applications: These batteries are commonly used in hearing aids.

Profiles: Secondary or Rechargeable Portable Batteries [h1]

Nickel Cadmium (NiCd)[h2]

Sales of NiCd batteries are slowing down. According to the Kelleher report, 2010 sales of over 22 million units are the high point, and sales will fall to less than 7.5 million units in 2015

Estimated Canadian sales in units 2011:	17,051,000 units
Estimated Canadian sales in tonnes 2011:	3,461 tonnes
Estimated Canadian tonnes available for collection 2011:	2,438 tonnes

History: In 1899, Swedish inventor Waldemar Jungner developed the first nickel cadmium battery. It wasn't until the 1960s that the battery was commercialized.

Advantages: NICd batteries have a long shelf and use life and can be charged up to 300 times. They feature a flat discharge curve, meaning they will deliver full voltage evenly over a long period and then quickly discharge rather than slowly delivering less and less voltage until empty. One prominent disadvantage of NiCd batteries is that they can suffer from the memory effect, sometimes called the "lazy battery effect." The problem is that, if the NiCd battery is frequently recharged after being only partially discharged, it will no longer deliver its full capacity.
Properties: NiCd batteries have an anode of cadmium and a cathode of nickel oxyhydroxide $Ni(OH)_2$. The electrolyte is aqueous potassium hydroxide (KOH). The component materials of NiCd batteries are steel, nickel, cadmium, alkali, water, and other non-metals.

	Fe/steel	Ni	Cd	alkali	water	other non-metals	plastic/ paper/ carbon
NiCd	35%	22%	15%	2%	5%	11%	10%

Toxicological concerns: In 2011, nickel cadmium batteries sold into Canada contained 52 tonnes of cadmium, 76 tonnes of nickel, and 7 tonnes of alkali.

Common applications: These include calculators, digital cameras, flashlights, medical devices (e.g., defibrillators), electric vehicles, and space applications.

Nickel Metal Hydride (NiMH) [h2]

As in the case of NiCd batteries, sales for NiMH batteries are slowing, but not nearly as quickly. Sales are expected to drop by roughly 1 million from 2010–2015.

Estimated Canadian sales in units 2011:	10,263,000 units
Estimated Canadian sales in tonnes 2011:	954 tonnes
Estimated Canadian tonnes available for collection 2011:	480 tonnes

History: NiMH batteries were introduced in the late 1980s and early 1990s, and they rapidly took market share away from NiCd batteries in the portable computing industry.

Advantages: NiMH batteries have a higher energy density than NiCd batteries. They also last longer and can be charged more, up to 500 times before permanently losing charge. Cost is higher than for NiCd batteries, however.

Properties: The anode of NiMH batteries is made of rare earth or nickel alloys with many metals (one example given is V, Ti, Zr, Ni, Cr, Co, and Fe). The cathode is made of nickel oxyhydroxide. The electrolyte is potassium hydroxide. The component materials are steel, zinc, manganese, nickel, cobalt, other metals, alkali, water, and other non-metals.

	Fe/steel	Zn	Mn	Ni	Co	other metals	alkali	water	other non-metals	plastic/ paper/ carbon
NiMh	20%	1%	1%	35%	4%	10%	4%	8%	8%	9%

Toxicological concerns: In 2011, nickel metal hydride batteries sold into Canada contained 38 tonnes of cobalt, 334 tonnes of nickel, 10 tonnes of zinc, and 10 tonnes of manganese.

Common applications: NiMH batteries are used in laptops, cell phones, camcorders, power tools, and electric vehicles.

Lithium Ion (Li-ion)[h2]

Sales of lithium ion batteries are growing slowly and are expected to reach nearly 5 million units by 2015.

Estimated Canadian sales in units 2011:	4,434,000 units
Estimated Canadian sales in tonnes 2011:	177 tonnes
Estimated Canadian tonnes available for collection 2011:	95 tonnes

History: The first mass-produced lithium ion batteries were commercialized by Sony in 1991. This battery type is now the chemistry of choice for most portable electronic devices.

Advantages: This battery is generally much lighter than other types of rechargeable batteries of the same size. A lithium ion battery pack loses only about 5% of its charge per month, compared to a 20% loss per month for NiMH batteries. Li-ion batteries experience no memory effect, which means that the user need not discharge them completely before recharging. And they can handle hundreds of charge-discharge cycles.

Li-ion cells are considered environmentally preferable to NiCd or NiMH cells because they do not contain cadmium or mercury.

Properties: The anode in lithium ion cells is a combination of carbon compound and graphite. The cathode is lithium oxide. The electrolyte in the batteries currently produced is liquid ($LiPF_6$ or $LiBF_4$ are given as examples), and it uses an organic solvent.

Component materials include steel, cobalt, lithium, aluminum, and other metals. Also, compared to other batteries, these have a relatively high content of non-metals (that are not alkali or water).

	Fe/steel	Co	Li	Al	other metals	other non-metals	plastic/ paper/ carbon
Li-ion	22%	18%	3%	5%	11%	28%	13%

Toxicological concerns: In 2011, lithium ion batteries sold into Canada contained 32 tonnes of cobalt, 5 tonnes of lithium, and 9 tonnes of aluminum.

Common applications: These include laptops, PDAs, power-assisted bicycles, cell phones, smart phones, and iPods.

Small Sealed Lead Acid (SSLA)[h2]

Estimated Canadian sales in units 2011:	378,000 units
Estimated Canadian sales in tonnes 2011:	395 tonnes
Estimated Canadian tonnes available for collection 2011:	355 tonnes

History: The first sealed, or maintenance-free, lead acid batteries emerged in the mid-1970s.

Advantages: The SSLA battery can combine oxygen and hydrogen to create water and prevent water loss.

Properties: Rather than submerging the plates in a liquid, the electrolyte is impregnated into a moistened separator, a design that resembles nickel- and lithium-based systems. This design enables the operation of the battery in any physical orientation without leakage.

Component materials include steel, sulfuric acid, other metals, and other non-metals.

	Fe/steel	H_2SO_4	other metals	other non-metals	plastic/ paper/ carbon
SSLA	65%	16%	4%	5%	10%

Toxicological concerns: In 2011, SSLA batteries sold into Canada contained 1.64 tonnes of sulfuric acid (H_2SO_4).

Common applications: SSLA batteries are commonly used in biomedical and healthcare devices in hospitals and retirement homes.

Recycling Performance Metrics [h1]

Measuring battery recycling programs has traditionally been limited to calculating the rate of collection, in other words, to measuring what is collected against what is "available" to be collected. Measuring the availability of waste batteries can be done through two distinct methods.

Collections-to-waste method: This method of defining "availability" is based on the quantity of portable batteries disposed of in the Municipal Household Special Waste (MHSW) system. The data come from actual waste audits.

Collections-to-sales method: This method of defining "availability" is based on annual sales within a jurisdiction (excluding exports). In some cases, this sales figure is further refined to take into consideration a battery's average lifespan and consumers' hoarding behaviour. Relative decreases in "availability" will change as the lifespan and hoarding variables change, and they are also impacted by the relative year-over-year sales of particular battery types.

The collections-to-waste method may appear to be the most accurate because it considers actual disposal. However, it is the collections-to-sales approach that is used for reporting recycling performance in most cases. Municipal waste audit methodologies used mostly by municipalities to produce waste composition estimates differ greatly, which creates challenges when measuring performance. A more harmonized approach in terms of reporting metrics will also allow for program comparisons with other jurisdictions and help identify best practices more easily.

In an attempt to equalize the information available, the authors compared sales to "available for collection" of primary battery figures on a per capita basis. The data show that the number of batteries reported as sold into British Columbia (per capita) was 16% lower than the adjusted (i.e., lowered) available for collection data in Ontario.

Comparison of available for collection figures for primary batteries

SOURCE	PROVINCE	SALES OR AVAILABLE FOR COLLECTION IN TONNES	SALES OR AVAILABLE FOR COLLECTION PER CAPITA IN KGS	TONNES COLLECTED	KGS COLLECTED PER CAPITA
SO 2011	ON	7,115	0.55	1,012	0.079
RBRCC 2010	BC	2,012	0.46	190	0.043
Kelleher	ON	6,410	0.50		
Kelleher	BC	2,195	0.50		

Definitions [h2]

In this first edition of ***Managing Canada's Waste Batteries, 2012***, we have attempted to provide transparent performance measurements. This means identifying not only how many batteries are collected but also what happens to them when they are collected, how they are recycled, and what they are recycled into. Several Canada-specific parameters exist that help define the methods needed to review performance; these include or exclude energy from waste (EFW) and/or slag as recycling. Given these parameters, we have defined 5 separate performance rates:

DEFINITIONS	
COLLECTION RATE	The amount collected compared to the weight of batteries placed on the market in that jurisdiction, excluding exports.
DIVERSION RATE	The amount of collected material that is not sent to landfill after processing (includes material used as slag and EFW) compared to the weight of batteries placed on the market in that jurisdiction, excluding exports.
RECOVERY RATE	The amount of material that is recovered for recycling and energy recovery (EFW) compared to the weight of batteries placed on the market in that jurisdiction, excluding exports.
RECYCLING RATE	The amount of material after processing that is recycled into a raw material for future application by product manufacturers compared to the weight of batteries placed on the market in that jurisdiction, excluding exports.
RECYCLING EFFICIENCY RATE (RER)	The amount of material that is recycled into a raw material for future application by manufacturers (excluding EFW) compared the amount of material that was processed (a measure of input-output efficiency).

To further clarify the above definitions:

Collection: Battery collection is always measured on a weight basis and usually divided into primary and secondary battery categories.

Diversion: Diversion is simply the quantity of collected batteries not sent to landfill. It includes batteries being converted into raw materials, fuel for energy, and process slag used for road fill.

Recovery: The recovery rate recognizes the amount of material collected that was converted into raw materials, including fuel for energy but excluding slag used for road construction.

Recycling Rate: The recycling rate recognizes the amount of raw material available for future application by product manufacturers (excluding EFW and slag utilization).

Recycling Efficiency Rate (RER): In line with the *European Batteries Directive* (2006/66/EC), the RER defined in this report recognizes recycling as the **whole process of recycling starting from waste batteries as received after collection, sorting, and processing until obtaining final fractions to be**

used for their original purpose (for battery manufacturing) or for other purposes, which do not undergo further treatment. The EU provides this definition in its directive: "recycling is the reprocessing in a production process of waste materials for their original purpose or for other purposes, but excluding energy and water."

The EU also includes the weight of the elements and compounds contained in the slag used for road construction material (as long as they meet heavy metal limits). The EU's decision to include slag as "recycled" in the RER was based on a reasoning methodology that considered the existing recycling capacity and technology in Western Europe.

For the most part, battery recycling technology is based on the pyrometallurgical process, which results in a considerable amount of slag as an end product. Slags are an output fraction of many thermal processes. They can partly be recovered in construction work (e.g., road construction, landfill construction, and backfilling) or are used as feedstock material for further production processes.

In deciding whether to include the content of battery materials transferred to slag in its measurement of recycling efficiency, the EU conducted an overview of the advantages and disadvantages from an environmental, economic, and social perspective. The conclusion was that, in the case of the European Union, "The accountability of slag for the recycling efficiency is decisive in several cases for the achievability of the required recycling efficiency," ... "economic losses can be avoided," and "job losses can be avoided."[1]

For the purposes of this Canadian report, the RER will not include the weight of elements and compounds used as co-product for slag as aggregate. We believe that a line should be drawn that reflects best practices in Canada.

This determination utilizes the same decision methodology as did the EU (see above), but it appropriately applies the advantages and disadvantages to the Canadian context. In this case, existing recycling capacity enables Canada to exceed the mandated recycling efficiency rates in Europe, as well as the targets in Canadian provinces, without the inclusion of the weight of the slag in the recycling rate.

Inclusion of slag as recycling may lead to discrimination of existing battery recyclers in collection programs where presently slag is not authorized to be used for road construction, instead of better recovery methods. This may lead to economic and job losses in Canada.

Another related issue is controlling undesired contamination when slag is used in particular applications (i.e., meeting the limit values for heavy metals when slag is used as road construction material). This is also an important factor affecting both whether to include the slag in the RER, and, if it is included, how to monitor which slag meets the minimum levels of toxicity.

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[1]Consortium ESWI, *Study on the Calculation of Recycling Efficiencies and Implementation of Export Article (Art. 15) of the Batteries Directive 2006/66/EC* (Brussels: European Commission, 2009), 82.

Although the European Union includes slag weight in the recycling rate, Ontario's primary battery recycling program (operated by Stewardship Ontario and funded by battery brand owners) does not, nor does the United Kingdom's national battery recycling program, BatteryBack.

It is also worth mentioning that existing life cycle assessment (LCA), which has been applied to alkaline batteries, demonstrates that there is no environmental benefit to landfill diversion when the recycling end products are combined primarily of energy from waste, slag and disposal. These factors alone suggest that a meaningful recycling efficiency standard should not include the weight of material sent for slag or to be used in energy-from-waste processes. Recycling efficiency should be based on high rates of recovery of the metals and elements to be used as substitutes for virgin materials that would otherwise have to be extracted, thereby achieving the maximum environmental benefit. For this reason, although we use several performance rates that include slag (e.g., the diversion rate), we do not include slag in the recycling rate, the recovery rate, or the RER. We leave it to readers to decide which rate is relevant to their needs.

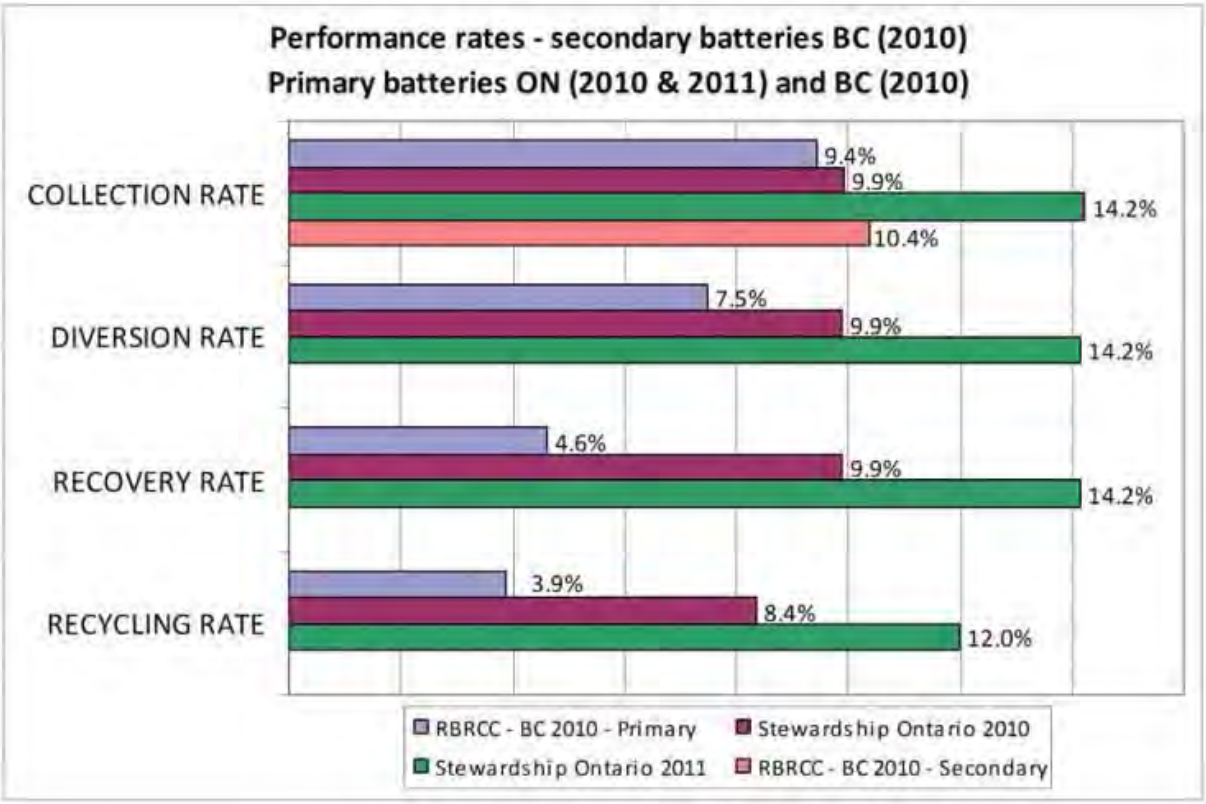
Targets [h2]

The table below provides a summary of legislated targets as well as voluntarily reported performance rates in other jurisdictions based on the definitions provided above.

Performance targets			
DEFINITIONS	EUROPEAN UNION (legislated)	ONTARIO (in approved stewardship plan)	BRITISH COLUMBIA (in approved stewardship plan)
COLLECTION RATE	25% by Sept 2012; 45% by Sept 2016 for all battery types	Approved stewardship plan – primary batteries: 20% (Y1); 25% (Y2); 30%(Y3); 35% (Y4); 40% (Y5); 45% (Y6)	Approved stewardship plan – all battery types: 12% (2010); 18% (2011); 25% (2012); 32% (2013); 40% (2014)
RECYCLING RATE		10.3% (Y1); 12.6% (Y2); 15.2% (Y3); 17.7% (Y4); 20.2% (Y5)	
RECYCLING EFFICIENCY RATE (RER)	INCLUDES SLAG/EXCLUDES EFW 75%: NiCd; 65%: Lead acid; 50% for all other primary and secondary batteries	EXCLUDES SLAG & EFW 80% primary	INCLUDES SLAG AND EFW 50%: Alkaline, Lithium ion, Nickel metal hydride; 75%: Nickel cadmium; 65%: SSLA

Performance Rates [h2]

The chart below provides performance rates for two years of Ontario's primary battery program and for half a year of British Columbia's all battery program, with primary and secondary batteries shown separately.



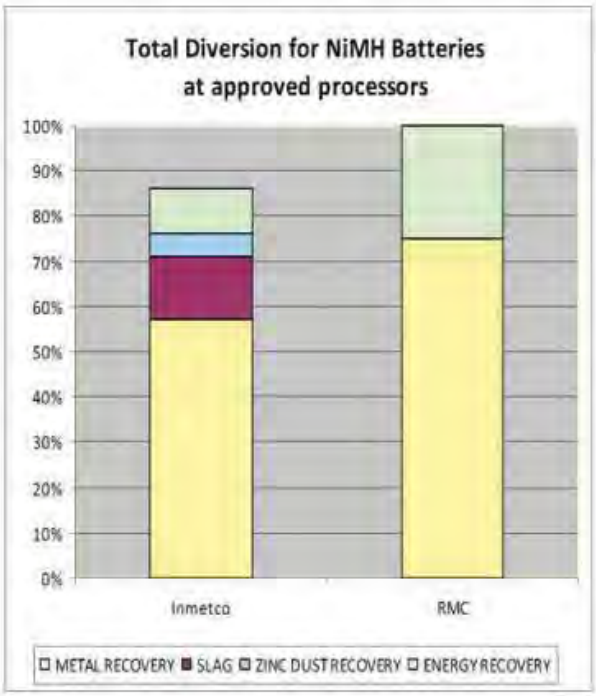
Total diversion rates for batteries at approved processors for specific battery chemistries:
The following table shows the percentage, by weight, of each battery that is recovered for raw materials, slag, energy, or disposed of. These are the rates reported by Raw Materials Company, Toxco, and Call2Recycle®.

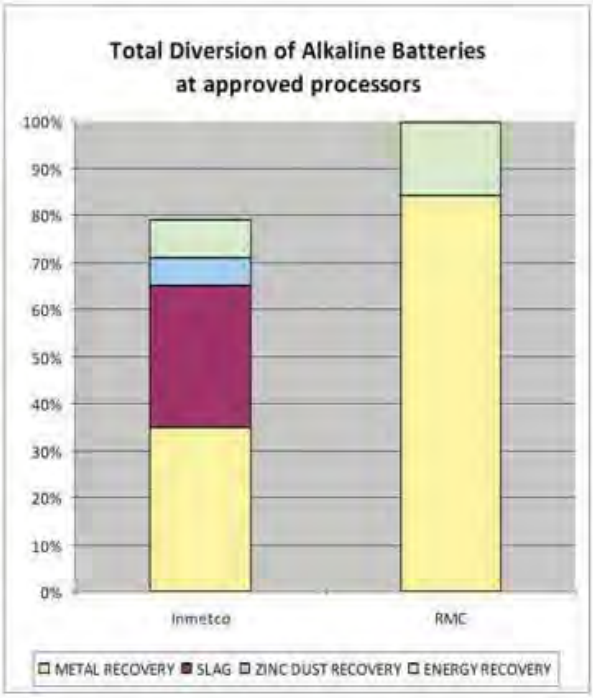
Battery Type	Alkaline	Alkaline	Li-ion	Li-ion	NiMH	NiMH	NiCd	NiCd
Process/Company	INMETCO	RMC	Xstrata	RMC	INMETCO	RMC	INMETCO	Toxco
% IN METALS								
Fe, Ni, Mn, Cu, Co					57%		50%	
Zinc Oxide, MnOxide, Potassium		59%						
Co, Al, Cu				75%		75%		
Co, Ni, Cu			27%					
Fe, Ni, Mn, Cu	35%							
Fe, Cu		25%						
Hg, Zn, Mn								
METAL RECOVERY	35%	84%	27%	75%	57%	75%	50%	
SLAG*	30%	0%		0%	14%	0%	2%	

CADMUIM RECOVERY							12%	
ZINC RECOVERY*	**6%**	**0%**		0%	5%	0%	4%	
ENERGY RECOVERY	**8%**	**15%**	44%	25%	10%	25%	12%	
DISPOSAL	**21%**	**0.5%**	**29%**	**0%**	**14%**	**0%**	**20%**	

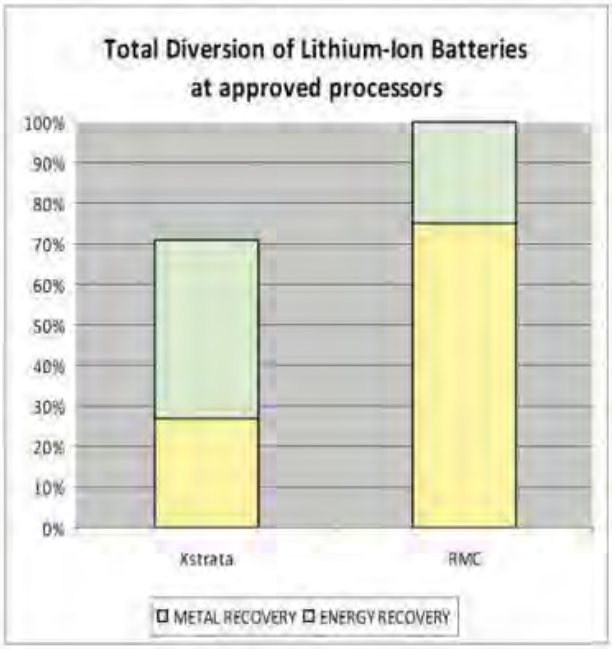
*Zinc bearing dust is sent with other electric arc furnace (EAF) dust for further processing. It is blended with other material in a rotary kiln. Industry reports that approximately 60% of the dust is separated into an iron-rich slag and sent for use in cement and asphalt. The remaining 40% by weight—known as "crude zinc oxide"—is used as feedstock in a zinc smelter. Approximately 60% is recovered as zinc for zinc bearing products, and the remaining approximately 40% non-zinc residual material is sent for disposal. The values reflected in the table account for this downstream processing.

These charts directly compare the total diversion, by battery chemistry, by processor.





[Designer: Check capitalization in "List of Figures" provided in the detailed Table of Contents.]



The following table summaries the percentages diverted, recovered, recycled, and disposed.

Battery Type	Alkaline	Alkaline	Li-ion	Li-ion	NiMH	NiMH	NiCd	NiCd
Process/Company	INMETCO	RMC	Xstrata	RMC	INMETCO	RMC	INMETCO	Toxco
Diversion from landfill disposal	79%	100%	71%	100%	86%	100%	80%	N/A
Diversion from landfill & road base aggregate or fill	49%	100%	71%	100%	72%	100%	66%	N/A
Recycling rate (metals recovery)	41%	84%	27%	75%	57%	75%	50%	N/A
Disposal	21%	1%	29%	0%	14%	0%	20%	N/A

Recommended Best Practices for Reporting [h2]

A more harmonized approach in terms of reporting metrics will also allow for program comparisons with other jurisdictions, and help identify best practices more easily.

We propose the following considerations with regards to best practices for reporting.
First, these data are needed for full transparency:

1) Sales (excluding exports) by unit, weight, and weight per capita
2) Available for recycling by weight and per capita (with lifespan and hoarding assumptions outlined)
3) Weight of batteries collected and per capita weight
4) Weight of batteries sent for use as slag

5) Weight of batteries used to generate energy through thermal treatment or as a reductant agent
6) Weight of metals and elements recovered for use by product manufacturers and per capita weight

All data should be clearly referenced and methodologies for data refinement need to be transparent. All data should be verified through independent audits.

Reporting should show performance for these measures, along with a clear definition of each.

1. Collection rate (waste to sales, both for straight sales and adjusted with a model)
2. Diversion rate (including slag and waste to energy)
3. Recycling rate (***not*** including waste to energy or slag)
4. Recycling efficiency rate (RER)

Life Cycle Assessment (LCA) and Battery Recycling [h1]

Life cycle assessment (LCA), which is also known as life cycle analysis, evaluates the mass balance of inputs and outputs of systems and organizes the findings into environmental themes or categories relative to resource use, pollution, human health, and ecological impact. To provide an overview of the impacts of battery recycling technologies, we examined the most recent LCAs available on the subject. A summary is provided in the table below.

Life cycle assessments (LCAs) on battery recycling

Title	Authors	Date
Life Cycle Impacts of Alkaline Batteries with a Focus on End-of-Life	For NEMA, by MIT: E. Olivetti, J. Gregory, and R. Kirchain	February 2011
A Review of Battery Life-Cycle Analysis: State of Knowledge and Critical Needs	Argonne National Laboratory: J.L. Sullivan and L. Gaines	October 2010
"A review of technologies for the recovery of metals from spent alkaline and zinc-carbon batteries."	E. Sayilgan et al. in *Hydrometallurgy*, 97(3–4), pp.158–166	July 2009
Battery Waste Management Life Cycle Assessment, Final Report for Publication	For Environmental Resource Management, by DEFRA: K. Fisher et al.	October 2006

The LCAs examined illustrated that, in order to truly understand the impacts of recycling batteries, the actual recycling facilities themselves need to be examined because of the many facility-specific operating variables that can affect the results. There are no peer-reviewed LCAs for the group of battery recycling facilities that recycle Canadian generated batteries, and most of the LCA data that do exist come from facilities operating in Western Europe (France, Belgium, Switzerland, United Kingdom).

This data can, however, provide some helpful information on both traditional **hydrometallurgical** recycling processes, which use water and chemicals to recover elements and metals, versus the more commonplace **pyrometallurgical** recycling processes, which break down the batteries through thermal treatment.

Hydrometallurgical and Pyrometallurgical Recycling Processes: Understanding the Difference [h2]

Both technologies and individual operating facilities have a different set of process inputs and outputs. A study summarized in *Hydrometallurgy* concludes that, overall, hydrometallurgical is preferable to pyrometallurgical recycling due to the first's "low cost requirements, possible recovery of leachants and a decrease of air pollution as there are no particles produced. However, some pre-treatment steps are required in order to improve metal dissolution rates in the aqueous phase, like battery classification, dismantling, magnetic separation, and leaching but per tonne of alkaline batteries processed" (Sayilgan et al., 2009, p. 161).

A comparative analysis commissioned by the UK Department for Environment, Food and Rural Affairs (DEFRA) and published in 2006 found that a pyrometallurgical facility owned by Batrec, a Swiss company, discards more water for processing and cooling than the hydrometallurgical facility operated by Recupyl in France.

Approximately fourteen times more water (1,400 litres) is discharged to the sewer using pyrometallurgy per tonne of batteries processes, compared to an estimated 100 litres from a hydrometallurgical process. The hydro process does require approximately 569 litres of water per tonne of batteries as input, but most of it gets re-circulated (recycled) back into the process (DEFRA, 2006), p. 59).

The pyrometallurgical process requires significantly more energy input as well. Per tonne of alkaline batteries, the pyrometallurgical process reviewed requires 1,690 kWh of electricity versus 959 kWh for the hydrometallurgical process. Raw Materials Company, based in Port Colbourne, reports that it requires 102 kWh to recycle a ton of batteries. In addition, 600 kWh per ton of energy in generated off site from the recovered paper and plastic. The pyrometallurgical process also requires an additional 58 kg of light fuel oil and 6 kg of propane per tonne processed.

Despite the additional energy required for the pyrometallurgical facility in Switzerland, the study illustrates that this facility has a more favourable global warming potential because it draws energy from a renewable source (hydroelectric power). In relation to energy consumption, location plays a key factor for both technologies because it helps determine the type of energy the facility uses.

Comparing the technologies for lithium-ion batteries consistently shows that the pyrometallurgical process requires approximately 6 times more electricity (800 kWh) than the hydrometallurgical process, which uses only 140 kWh for the same batteries. The hydrometallurgical process discharges one third the water (330 litres versus 1000 litres).

Finally, the greatest benefit from recycling batteries is what is actually recovered; these recovered resources preserve raw materials by becoming their substitute. The benefit from avoiding the production of virgin metals is the most significant factor in the LCA, which means that, if the process has a high recycling efficiency rate (RER), it is more likely to also have a more favourable environmental profile. This relationship is especially true for the recycling of zinc carbon and alkaline manganese chemistries because avoiding the environmental impacts of raw material extraction, energy and fuel consumption, and the transportation and production of virgin zinc and manganese or ferromanganese contribute the greatest benefit overall, far outweighing the impacts associated with battery collection, sorting, transport, disposal, and energy consumption during processing.

As Sayilgan and colleagues (2009) conclude,

> Compared to pyrometallurgical methods, hydrometallurgical methods are becoming a well-established and efficient method for recovering metals from raw materials. Hydrometallurgical methods are chosen as an extraction process and environmental control as well, since the

metal extracted will avoid waste production. For the long-term, effective, economical and practical recovery technologies are required not only for metal recoveries but also for other components of batteries such as plastic, paper, steel, etc. (p. 164)

Canadian Program Summaries [H1]

British Columbia [h1]

Electronic and Electrical Product Stewardship Program [h2]

Program scope and targets

Schedule 3 of the *Recycling Regulation* covers batteries in the electronic and electrical product category. It sets out 5 phases of products to be added to the program. As new products are phased in, for example electric or electronic tools such as drills (due to be phased in on July 1, 2012), so too are the batteries used for those products.

Included in the program as of February 2012 are televisions, computers, computer equipment, printers, audio-visual and consumer equipment, thermostats, cell phones, residential fluorescent lamps, smoke detectors, and small appliances and the batteries used in those products.

As of July 1, 2012, the fifth phase of the program will begin, and these products and the batteries used to power them will be included: electrical and electronic tools, medical devices, automatic dispensers, lighting equipment, toys, leisure and sports equipment, monitoring and control instruments, telecommunications equipment, and large appliances.

The Rechargeable Battery Recycling Corporation of Canada (RBRCC), through Call2Recycle®, is the industry steward for the program. The organization has set target "recycling rates" and "collection rates." The recycling rate is also called a "recovery rate" and refers to the percentage of a battery's weight reclaimed for use in a secondary product. The "recovery rate" is 50% for primary alkaline batteries, 75% for nickel cadmium batteries, 65% for SSLA batteries, and 50% for all other rechargeables.

The *Recycling Regulation* calls for a 75% recovery rate or another recovery rate established by the director. The collection rate targets established by Call2Recycle® are 12% of batteries sold into BC for 2010, 18% for 2011, 25% for 2012, 32% for 2013, and 40% for 2014. The Call2Recycle® plan notes that the "collection rate" is the batteries collected for recycling in the market divided by the number available for collection (expressed as a percentage).

The denominator, batteries sold into BC, is defined in RBRCC's 2010 plan as " estimates developed by industry stewards based on total Canadian battery sales allocated by provincial population. Years 2010–2012 assume an annual increase in sales of 2%. Upon launch, more accurate baseline information will be used based upon collection of sales data from battery stewards." The 2010 estimate of batteries sold into BC is 2,514,000 kilograms. The target is 12% or 301,680 kilos. The breakdown of this target is 241,340 kilos of primary batteries (80% of the total) and 60,340 kilos of secondary batteries (20% of the total).

Supporting regulatory framework

In October of 2004, British Columbia consolidated all product stewardship regulations into the *Recycling Regulation* under the *Environmental Management Act.*

Summary of initiative

The program targets brand owners or first importers (stewards) of electronic or electric products and their batteries. Stewards are required to submit stewardship plans describing the development and operation of the collection program. An approved plan must also provide for producer operated and financed end-of-life management for products; reasonable and free consumer access to collection facilities; consumers awareness, performance assessment, and dispute resolution procedures; environmental impact mitigation; and adherence to the order of preference in the pollution prevention hierarchy. This hierarchy is defined in the *Recycling Regulation* as the following, in order of preference:

(a) reduce the environmental impact of producing the product by eliminating toxic components and increasing energy and resource efficiency;
(b) redesign the product to improve reusability or recyclability;
(c) eliminate or reduce the generation of unused portions of a product that is consumable;
(d) reuse the product;
(e) recycle the product;
(f) recover material or energy from the product; or
(g) otherwise dispose of the waste from the product in compliance with the *Environmental Management Act*. (Section 5[3])

Collection

RBRCC had 1,569 collection sites at the end of 2010. Of these sites, 1,372 or about 87% were defined as active (returned batteries and/or cell phones within the 2010 period), and the remaining 197 or close to 13% were inactive (returned no batteries and/or cell phones within the 2010 period). Many inactive sites are expected to become active once the container weight threshold is met (filled). The target site count for 2015, the fifth year of the program is 2,000 sites.

The breakdown of the 1,569 collection sites for 2010 is as follows: 891 "retail" sites collecting 44% of batteries collected by weight, 199 "business" sites collecting 38%, 354 "public agency" sites collecting 10%, and 125 "municipality" sites collecting 8%. How the 197 "inactive" sites are distributed over the four types of sites is unknown.

Given the 2010 population figure (4,400,057), 1,569 collection sites translates to a per capita rate of 1 collection site per 2,804 British Columbians.

Promotion and education

For the six months that ended December 31, 2010, RBRCC's direct expenditures on education and promotion were approximately $69,000. In addition, RBRCC had two individuals substantially dedicated to education and promotion in the province. Program support outreach programs included consumer advertising, public event sponsorship, an exhibit at the Pacific National Exhibition, and other initiatives.

Program financing

The Call2Recycle® program is financed by over 175 manufacturers. Some are direct producers of rechargeable batteries, and others produce products powered by rechargeable batteries. This last category includes cellular phone manufacturers. A licensee fee is assessed for units and weights sold into North America. Funding for costs of the RBRCC program attributable to the management of primary batteries will be paid by the stewards of those products who support the Call2Recycle® stewardship plan.

There is mention in the Call2Recycle® plan dated February 2010 that the program will consider transitioning to a charge per unit sold in the province. This change would not take place during first two years of operation in the province.

Sales

Sales of batteries into BC for 2010 are estimated by Call2Recycle® to be a total of 2,514 tonnes. These sales are broken down as 2,012,000 kilos of primary batteries and 502,000 kilos of rechargeable batteries. The sales are not broken down further by chemistry, but, if we use sales proportions from the Kelleher report for 2010, sales by chemistry are as follows.

Alkaline: 1,499.7 tonnes
Zinc carbon: 452.3 tonnes
Zinc air button cell: 2.9 tonnes
Lithium (P): 54.9 tonnes
Silver oxide button cell: 1.6 tonnes
Other primary batteries: .56 tonnes
Nickel cadmium: 347.3 tonnes
Nickel metal hydride: 95.7 tonnes
SSLA: 39.6 tonnes
Lithium ion: 17.8 tonnes
Other secondary batteries: 1.5 tonnes

Collection rates and tonnage

Call2Recycle® set target "collection rates" for 2010 in its stewardship plan at 12% for primary batteries, which would be equal to 241,440 kilos, and at 12% for rechargeable batteries, which would equal 60,240 kilos. The recovery rates are reported in the 2010 annual report as 9.4% or 189,128 kilos for primary batteries and 10.3% or 51,706 kilos for secondary batteries.

Toxics disposed of at end of battery life in 2011

According to 2010 British Columbia sales and collection figures from Call2Recycle®, 1,823 tonnes of primary batteries and 450 tonnes of secondary batteries were not recovered. If these batteries went to landfill, that represents 373 tonnes of manganese, 283 tonnes of zinc, 106 tonnes of nickel, 47 tonnes of cadmium, 6 tonnes of cobalt, 410 kilos of silver, 400 kilos of lead, and 30 kilos of mercury.

Manitoba [h1]

Household Hazardous Material and Prescribed Material Stewardship Regulation [h2]

Program scope and targets (mandated for primary and rechargeable)

The Manitoba *Waste Reduction and Prevention (WRAP) Act* was proclaimed in force in 1990. The *Household Hazardous Material and Prescribed Material Stewardship Regulation* has only just come into force as of April 2011. It adds 10 categories of materials to the *WRAP Act*, including rechargeable batteries (Section 2[*i*]) and other batteries (Section 2[*j*]).

The *Household Hazardous Material and Prescribed Material Stewardship Regulation* does not call for a specific recovery rate or target. The Rechargeable Battery Recycling Corporation of Canada (RBRCC), through Call2Recycle®, is the industry steward for the program. The collection rate targets established by Call2Recycle® are 11% of batteries sold into Manitoba for 2011, 15% for 2012, 18% for 2013, 21% for 2014, and 25% for 2015. The Call2Recycle® plan notes that the "collection rate" equals the batteries collected for recycling in the market divided by the number available for collection (expressed as a percentage).

The denominator, batteries sold into Manitoba, is defined in the plan as "estimates developed by battery industry representatives ... based on total Canadian battery sales allocated by provincial population. Years 2011–2015 assume an annual increase in sales of 2%. Upon launch, more accurate baseline information will be used based upon collection of sales data from battery stewards." The 2011 estimate for batteries sold into Manitoba is 553,000 kilograms. The target is 11% or 60,100 kilos. The breakdown of this target is 51,100 kilos of primary batteries (80% of the total) and 9,000 kilos of secondary batteries (20% of the total).

Call2Recycle® has also set target "recycling rates." The recycling rate is also referred to as a "recovery rate" and represents the percent of a battery's weight reclaimed for use in a secondary product. The "recovery rate" is 50% for primary alkaline batteries, 75% for nickel cadmium batteries, 65% for SSLA batteries, and 50% for all other rechargeables.

Supporting regulatory framework

The Manitoba *Waste Reduction and Prevention Act*, which was proclaimed in force in 1990, is the main regulatory framework. Added to this recently is the *Household Hazardous Material and Prescribed Material Stewardship Regulation*, which has only just come into force as of April 2011.

Summary of initiative

This initiative targets stewards; in the regulation, a steward is defined as

> "(a) the first person who, in the course of business in Manitoba, supplies a designated material to another person; or
>
> (b) a person who, in the course of business in Manitoba, uses a designated material obtained in a supply transaction outside of Manitoba" (p.2).

Collection
The Call2Recycle® plan states that, as of May 1 2010, the existing collection network includes 160 sites. The Call2Recycle® website (http://www.call2recycle.ca/manitoba/) informs us that there are now over 300 participating collection sites (retail, business, and municipal) in Manitoba. A detailed breakdown is not available, but the collection site locator on the website lists 80 locations in or within 50 km of Winnipeg, 58 of which are "active."

Promotion and education budget
According to the C2R plan for Manitoba, in 2011, Call2Recycle® will spend roughly $100,000 for Manitoba outreach and promotion activities.

Program financing
The Call2Recycle® program is financed by over 175 manufacturers of rechargeable batteries or of products powered by rechargeable batteries. This last category of producer includes cellular phone manufacturers. A licensee fee is assessed for units and weights sold into North America. Funding for costs of the RBRCC program attributable to the management of primary batteries will be paid by the stewards of those products who support the Call2Recycle® stewardship plan.

Sales
Call2Recycle® estimates the total primary and rechargeable batteries sold into Manitoba in 2011 at 553,000 kilograms. Sales are not broken down by chemistry, but, if we use sales proportions from the Kelleher report for 2010, sales by chemistry are as follows.

Alkaline: 310.4 tonnes
Zinc carbon: 93.6 tonnes
Zinc air button cell: 0.6 tonnes
Lithium (P): 11.4 tonnes
Silver oxide button cell: 0.3 tonnes
Other primary batteries: 0.1 tonnes
Nickel cadmium: 79.8 tonnes
Nickel metal hydride: 22.0 tonnes
SSLA: 9.1 tonnes
Lithium ion: 4.1 tonnes
Other secondary batteries: 0.3 tonnes

Collection rates
Collection data for 2011 is not yet available. The Call2Recycle® plan targets 11% for primary batteries, which would be 51,100 kilos, and 11% for rechargeable batteries, which would be 9,000 kilos.

Ontario [h1]

Municipal Hazardous or Special Waste Program [h2]

Program scope and targets (mandated for primary)
The Municipal Hazardous or Special Waste Program was established by Stewardship Ontario, an industry-funded organization (IFO), in response to a program request letter from the Minister of the Environment under the *Waste Diversion Act*.

The *Municipal Hazardous or Special Waste Program Plan (Volume II: Material-Specific Plans)*, dated July 30, 2009, provides key information on the 20 groupings of products and materials covered by the plan. So, for batteries, the document provides a definition, market and product information, and details about the institutional and commercial generators of batteries, the quantity supplied for use (and how that quantity is calculated), the quantity available for collection, the current management infrastructure and its performance, the barriers and opportunities to increased diversion, research and development for batteries, collection accessibility strategies, promotion and educational initiatives, the targets related to collection and to collection accessibility, recycling targets, and the costs and fee rates attributable to battery stewardship.

Supporting regulatory framework
The *Waste Diversion Act* became law in June 2002. Sections 3 and 4 create Waste Diversion Ontario (WDO) and determine the composition of its board. In Section 5 of the act, WDO is charged with developing, implementing, and operating diversion programs for designated wastes and with monitoring the effectiveness and efficiency of those programs. WDO also determines the amount of money required by the IFOs, promotes public awareness and participation, establishes dispute resolution processes, ensures that programs affect the marketplace in a "fair manner," and advises or reports to the Minister of Environment and Energy.

Section 23 of the act gives the minister the power to develop a waste diversion program for a designated waste, in cooperation with an industry-funded organization. Section 24 describes the establishment of an IFO.

Summary of initiative
The initiative targets stewards, defined in the May 23, 2007 *Municipal Hazardous or Special Waste Program Plan* as "brand owners and/or first importers into Ontario of products that result in the generation of municipal hazardous or special waste" (p. 2).

Collection
The program has a total of 1,351 permanent battery collection points. Of these, 1,152 are "Battery Incentive Program" drop-off locations. The majority of these sites are schools, hospitals, retirement homes, pharmacies, and retailers. Approximately 480 are retailers (not including pharmacies), the majority of which are Hasty Market (196), Staples (131), Home Hardware (52), Costco (26), and Mini-A-Mart (20) stores.

The drop-off network also includes 111 Home Depot and Lowes stores that are not part of the Battery Incentive Program (BIP). This brings the total retail locations to approximately 591 (excluding pharmacies).

The 88 municipal depots that are part of the drop-off network are also not part of the BIP.

In 2011, Stewardship Ontario held 297 one-day municipal events, often at public works yards, landfills, or transfer stations. Many of these events were held in towns not served by a permanent drop-off location.

Incentives

The incentive program is designed to increase effectively and efficiently the diversion of obligated batteries to achieve the diversion target of 20% of the single-use batteries generated in Ontario annually. There are two different incentives being paid to two different participant groups.

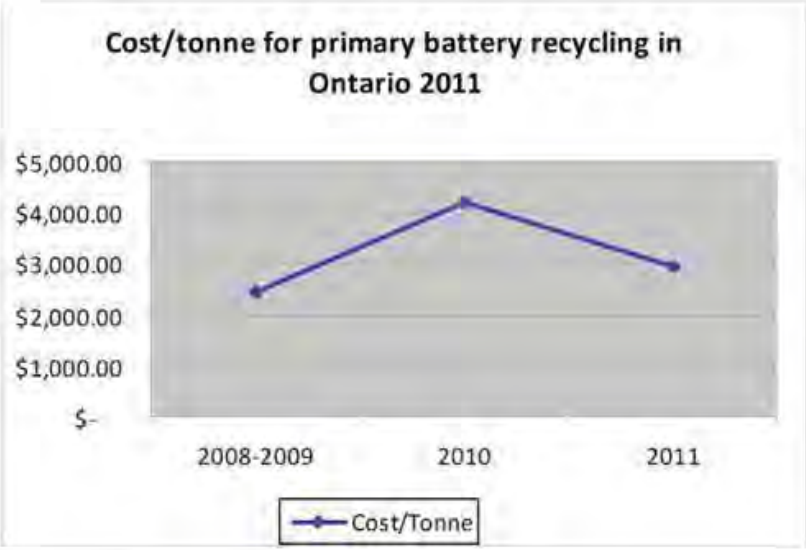
The Battery Recovery Incentive (BRI) pays approved transporters for the collection, recovery, and delivery of batteries to an approved battery processor. An approved transporter will be paid $1.54/kg collected and transported in Southern Ontario and $3.86/kg collected and transported in northern Ontario.

The Battery Processing Incentive (BPI) pays approved processors for the sorting, processing, and disposition reporting of batteries in accordance with the MHSW Program Processor Standards. Approved processors are paid $1.24/kg processed.

Program financing

Stewardship Ontario charges industry a lump sum based on market share. It is left up to the Individual stewards and retailers to determine if they wish to recoup or absorb those costs as they do with other supply chain costs. Some retailers may elect to recoup those costs by charging a fee to customers at the point of sale.

For 2011, the total cost to Stewardship Ontario for the battery program was $2,980,267. This figure is down 7% from 2010. The program collected 1,011 tonnes of primary batteries for a cost per tonne of $2,948. This cost per tonne figure is down 30% from 2010, as volume collected has increased dramatically despite the decrease in program costs.



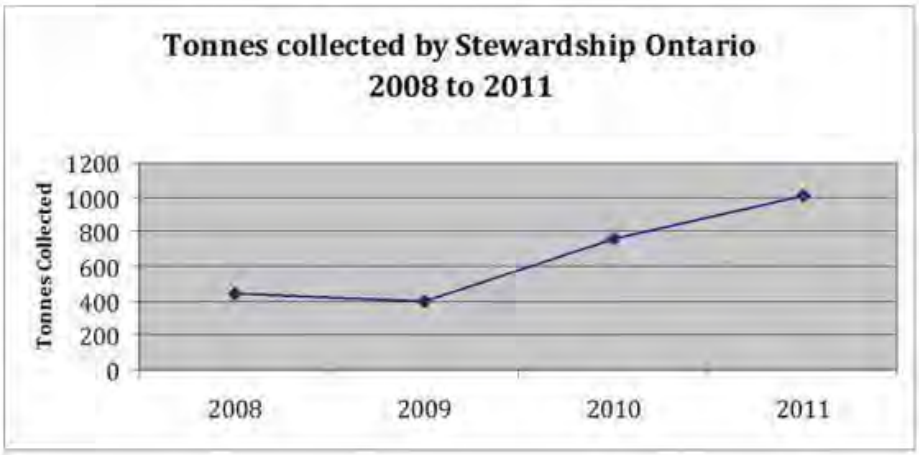
Sales/available for collection

Stewardship Ontario estimates that 7,115 tonnes of primary batteries were available for collection in Ontario in 2011. This estimate is based on a 30% five-year hoarding model. Sales are not broken down by chemistry, but, if we use sales proportions from the Kelleher report for 2010, sales by chemistry are as follows.

Alkaline: 5280 tonnes
Zinc carbon: 1600 tonnes
Zinc air button cell: 10 tonnes
Lithium (P): 194 tonnes
Silver oxide button cell: 5 tonnes
Other primary batteries: 2 tonnes

Collection rates

Stewardship Ontario (SO) set targets of 1,595 tonnes for 2011 (735 tonnes for the first and second quarters and 860 tonnes for the third and fourth.) Actual collection was 1,012 tonnes or 14%. SO continues to raise targets ambitiously each year. Although these targets are not being met, the collection rate has continued to rise and will likely improve again as the BIP sites improve their visibility.



Toxics disposed of at end of life in 2011

In Ontario in 2011, 6,103 tonnes of available primary batteries were not recovered. If these batteries went to landfill, that represents 1,247 tonnes of manganese, 944 tonnes of zinc, 24 tonnes of nickel, 1 tonne of silver, 1 tonne of lead, and 105 kilos of mercury being landfilled.

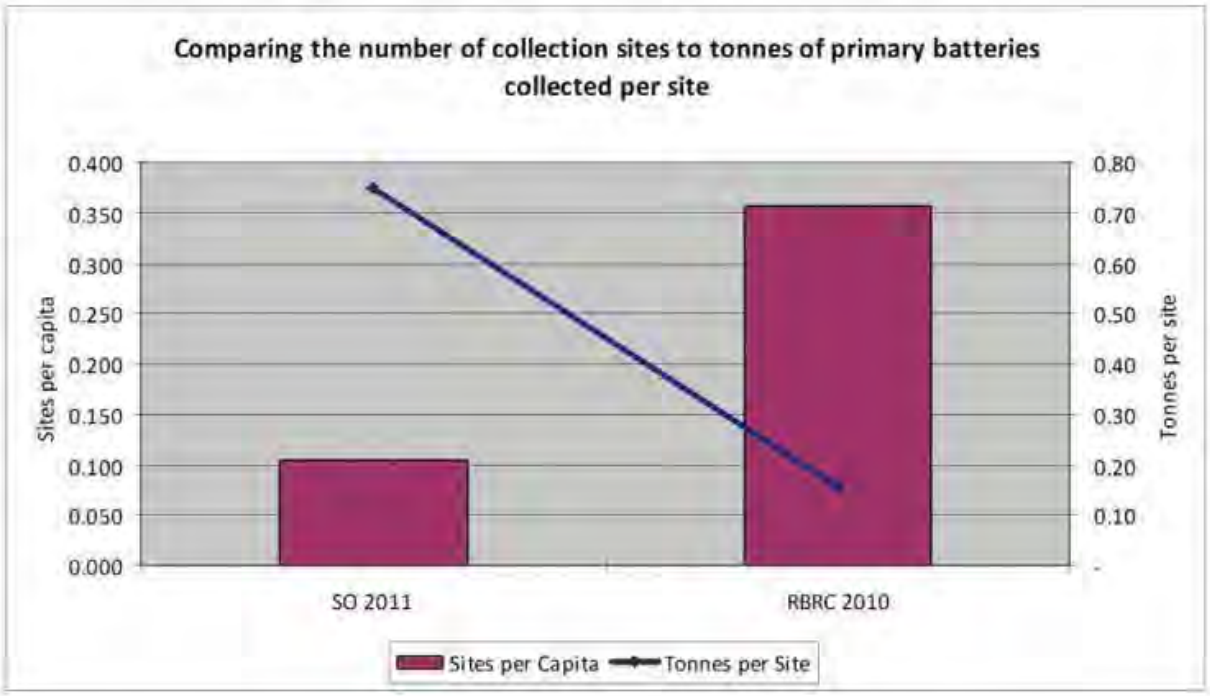
Collection Networks [h1]

Comparing 2011 Ontario data to 2010 British Columbia data shows that the Ontario program collects far more batteries per site with fewer return locations per capita. This comparison is made difficult by several factors.

The first is that the data provided by RBRCC is for the second half of 2010 (six months only), while Stewardship Ontario has program data available for the whole 2011 calendar. Second, Stewardship Ontario's program collects primary batteries only, while RBRCC's Call2Recycle® program in British Columbia collects both primary and secondary batteries.

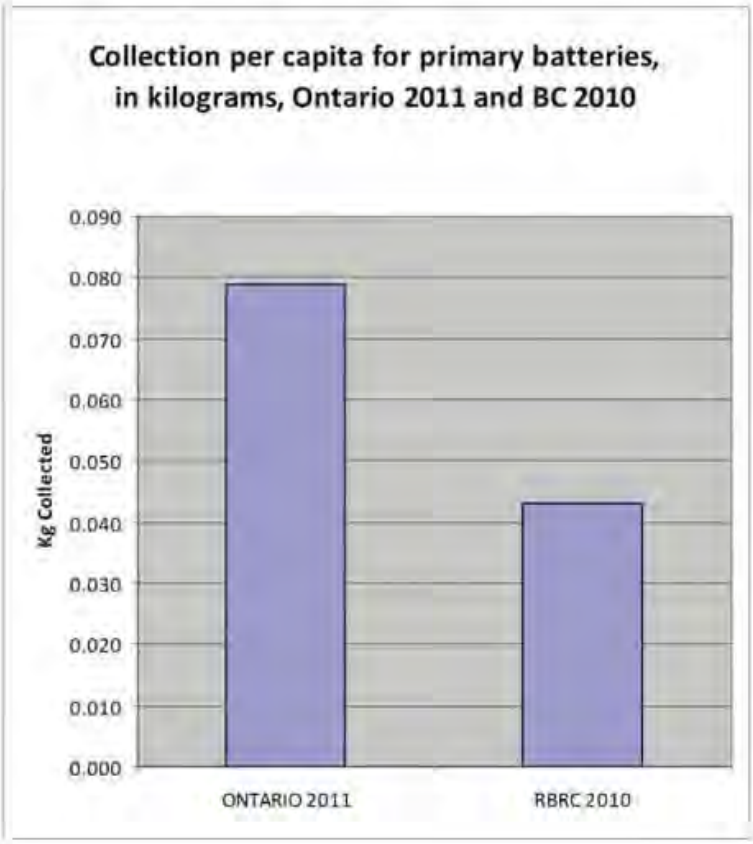
It is likely that newer BC data will reveal additional sites and higher volumes collected at each site due to program maturity. In effect, each site is probably collecting more tonnage of batteries than it was in 2010.

This table will be updated in June 2012, when British Columbia and Manitoba site counts and tonnage throughput are published in performance reports to provincial governments.



The following chart shows the recovery of primary batteries per capita. The sales figures provided by SO and RBRCC show that Ontario has a higher sales of primary batteries per capita than does BC. In Ontario, the sales (available for collection) figure is .55 kg/person. In BC, the figure (for primary batteries only) is .46 kg/person, so it is not surprising that, in Ontario, SO recovers more batteries per capita. Nevertheless, the rate of recovery is significantly higher in Ontario.

In Ontario in 2011, SO recovered 0.079 kg of primary batteries per person while the same rate for BC in 2010 was 0.043 kg per person (on a per annum basis).



Battery Recyclers for Canadian Collection Programs [h2]

Currently, batteries collected by SO and RBRCC are processed by several different agents in North America.

All batteries collected through Stewardship Ontario's collection channels are sent to Raw Materials Company (RMC) in Port Colborne, Ontario, with the exception of primary lithium batteries, which are sent to INMETCO in Ellwood City, Pennsylvania.

Batteries collected by RBRCC from British Columbia go to Toxco in Trail, BC where they are sorted and sent to different processors depending on battery chemistry. Lithium primary and secondary batteries stay with Toxco for processing. Alkaline batteries are sent to INMETCO. Lithium-ion batteries are shipped to Xstrata in Sudbury, ON, and SSLA batteries are sent to Newalta in Ville Sainte–Catherine, QC.

It should be noted that the website for Toxco (http://www.toxco.com/aboutrecycle.html) mentions that the company has the capability to recycle alkaline and other chemistries of battery as well.

Program	Company Name	Location	Alkaline	Zinc Carbon	Lithium Primary	Li-ion	NiCd	NiMH	SSLA
ON SO	RMC	Port Colborne, Ontario	X	X					
ON SO	INMETCO	Ellwood City, Pennsylvania, USA			X				
BC RBRCC	Xstrata	Sudbury, Ontario				X			
BC RBRCC	INMETCO	Ellwood City, Pennsylvania, USA	X	X	X		X	X	
BC RBRCC	Newalta	Ville Sainte-Catherine, Quebec							X
BC RBRCC	Toxco	Trail, BC				X			
ON RBRCC (voluntary)	Xstrata	Sudbury, Ontario				X			
ON RBRCC (voluntary)	INMETCO	Ellwood City, Pennsylvania, USA					X	X	
ON RBRCC (voluntary)	Newalta	Ville Sainte-Catherine, Quebec							X
ON RBRCC (voluntary)	Toxco	Trail, BC				X			
ON RMC (voluntary)	Toxco	Lancaster, Ohio					X		

Battery Composition Materials: Toxicology [h1]

Manganese (Mn) [h2]

Manganese is the third largest portion, by weight, of zinc carbon batteries and the second largest portion, by weight, of alkaline batteries. Manganese is also present in lithium primary, nickel metal hydride, and silver oxide button cell batteries. In 2011, 3,701 tonnes of manganese were sold in Canada within batteries.

What is manganese? [h3]

Manganese is a naturally occurring metal that is found in many types of rocks. Pure manganese, however, does not occur naturally because, in nature, the metal combines easily with elements such as oxygen, sulfur, or chlorine. Manganese compounds occur naturally in many foods, and pure manganese is sometimes added to foods. Manganese is used principally in steel production to improve hardness, stiffness, and strength.[2]

Exposure to manganese [h3]

The primary way one can be exposed to manganese is by eating manganese-containing nutritional supplements or food. Occupations such as working in a factory where steel is made may lead to increased chances of being exposed to high levels of manganese. Manganese is regularly found at low levels in groundwater, drinking water, and soil.

How manganese affects humans [h3]

Manganese is an essential nutrient, and most people eat a small amount of it each day. Workers exposed to high levels of manganese, however, can suffer health problems, the most common of which involve the nervous system. These negative health outcomes include behavioural changes and other nervous system effects, for example, movements that become slow and clumsy. This combination of symptoms, when sufficiently severe, is referred to as "manganism."

The EPA concluded that existing scientific information could not determine whether excessive manganese exposure can cause cancer.

Manganese in the environment [h3]

Manufacture, use, and disposal of manganese-based products can lead to the release of manganese to the air, soil, or water. Manganese will not break down in the environment. In water, manganese tends to attach to particles or settle into the sediment. The chemical state of manganese and the type of soil determine how fast it moves through the soil and how much is retained in the soil.

Federal regulations or recommendations regarding manganese [h3]

Manganese is listed as a "special case" in the *Guidelines for Canadian Drinking Water Quality*[3]

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[2] Manganese, *Agency for Toxic Substances and Disease Registry*, www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=23.

[3] Health Canada, *Guidelines for Canadian Drinking Water Quality*, http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php.

Zinc (Zn) [h2]

Zinc is the largest portion, by weight, of zinc carbon batteries and the third largest portion, by weight, of alkaline batteries. Zinc is also present in NiMH, zinc air button cell, and silver oxide button cell chemistries. In 2011, 2,804 tonnes of zinc was sold within batteries, primarily in alkaline and zinc carbon batteries

What is zinc? [h3]

Zinc is a very common element in the earth's crust. It is present in air, soil, and water, and is in all foods. Zinc has many commercial uses, for example, within coatings to prevent rust, in dry cell batteries, and as a substance to mix with other metals to make alloys like brass and bronze. Zinc combines with other elements to form zinc compounds. Common zinc compounds include zinc chloride, zinc oxide, zinc sulfate, and zinc sulfide.

Exposure to zinc [h3]

One can be exposed to zinc by drinking contaminated water or a beverage that has been stored in or flows through metal containers or pipes that have been coated with zinc to resist rust. Eating too many dietary supplements that contain zinc or working at any job that involves the use of zinc or zinc compounds can also expose individuals.

How zinc affects humans [h3]

Zinc is an essential element in our diet. Too much zinc is harmful, but not enough zinc can cause problems. Negative effects generally begin at levels 10–15 times above the amount needed for good health. Large doses taken by mouth can cause stomach cramps, nausea, and vomiting. Confirmed studies on rats have shown that feeding them large amounts of zinc can cause infertility.

Inhaling large amounts of zinc (as dusts or fumes) can cause a specific short-term disease called metal fume fever. The long-term affects of breathing high levels of zinc are unknown.

Zinc in the environment [h3]

Some zinc is already present in the environment, having been released by natural processes, but most comes from human activities like mining, steel production, coal burning, and the burning of waste. Zinc will attach to soil, sediments, and dust particles in the air. Rain and snow will cause zinc dust particles to settle to earth. Depending on the type of soil to which they become attached, zinc compounds may move into the groundwater and into rivers, streams, and lakes. Much of the zinc in soil, however, remains attached to soil particles and will not dissolve in water. It will build up in fish and other organisms, but will not build up in plants.

Federal regulations or recommendations regarding zinc [h3]

Zinc smelters and refineries are considered to be "toxic" as defined in Section 64 of the 1999 *Canadian Environmental Protection Act* (CEPA). Consequently, the by-products of zinc smelters and refineries were added to the "List of Toxic Substances" in CEPA as "particulate matter containing metals that is released in emissions from zinc plants" (see #68 in Schedule 1).

Nickel (Ni) [h2]

Significant amounts of nickel are found in nickel cadmium and nickel metal hydride batteries. Small amounts are also present in alkaline, lithium primary, and silver oxide button cell batteries. In total, 1,168 tonnes of nickel were sold in Canada within batteries in 2011.

What is nickel? [h3]

Nickel is a common and plentiful natural element. Nickel can be combined with other metals, such as iron, copper, chromium, and zinc, to form alloys. Coins, jewellery, and other items are made from these alloys. Most nickel is used to make stainless steel. Nickel can also combine with elements such as chlorine, sulfur, and oxygen to form nickel compounds. Many nickel compounds dissolve fairly easily in water. Nickel compounds are used for nickel plating, to colour ceramics, to make some batteries, and as substances known as catalysts that increase the rate of chemical reactions.

Exposure to nickel [h3]

Eating food containing nickel is the primary source of exposure for most people. Another common form of exposure is skin contact. Higher exposure may occur if you work in industries that process or use nickel.

How nickel affects humans [h3]

From 10 to 20% of the population is sensitive to nickel and can have an allergic reaction to it. The most common reaction is a skin rash at the site of contact. Some people who are sensitive to nickel have asthma attacks following exposure.

Chronic bronchitis and reduced lung function have been experienced by workers in nickel refineries or nickel-processing plants. Some who drank water containing high amounts of nickel experienced stomach ache and suffered adverse affects in their blood and kidneys.

Cancers of the lung and nasal sinus have occurred in workers who breathed dust containing high levels of nickel compounds while working in nickel refineries or nickel-processing plants. The U.S. Environmental Protection Agency (EPA) determined that nickel refinery dust and nickel sulfide are human carcinogens.

Tests on animals have shown damage to their lungs and nasal cavities due to breathing nickel compounds, lung disease due to eating or drinking large amounts of nickel, and affects on their stomach, blood, liver, and reproductive and immune systems.

Nickel in the environment [h3]

Nickel can be released into the atmosphere by oil-burning power plants, coal-burning power plants, trash incinerators, or industries that make or use nickel, nickel alloys, or nickel compounds. In the air, it attaches to small particles of dust, which can settle to the ground due to rain or snow. Nickel released in industrial wastewater ends up in soil or sediment, where it attaches to particles containing iron or manganese. Nickel seems not to accumulate in the food chain.

Federal regulations or recommendations regarding nickel

Nickel is on the "List of Toxic Substances" managed under CEPA (Schedule 1).

Cadmium (Cd)[h2]

Cadmium makes up 15%, by weight, of nickel cadmium batteries. In 2011, NiCd batteries containing 519 tonnes of cadmium were sold in Canada.

What is cadmium?[h3]

Cadmium is a natural element in the earth's crust. All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Cadmium is often extracted during the production of other metals like zinc, lead, and copper. Cadmium has many uses, including in batteries, metal coatings, and plastics.

Exposure to cadmium[h3]

Breathing contaminated workplace air, drinking contaminated water, or living near industrial facilities that release cadmium into the air can result in exposure to this element. Humans are also exposed by smoking cigarettes, breathing cigarette smoke, or eating foods containing cadmium.

How cadmium affects humans[h3]

High levels of cadmium ingested into the lungs can cause severe damage. High levels of exposure from eating food or drinking water containing cadmium can irritate the stomach, leading to vomiting and diarrhoea. Long-term exposure may lead to a build-up of cadmium in the kidneys, possibly resulting in kidney disease. Other long-term effects are lung damage and fragile bones.

The U.S. Department of Health and Human Services (DHHS) has determined that cadmium and cadmium compounds are known human carcinogens.

Cadmium in the environment[h3]

Cadmium enters the environment from mining, industry, and burning coal and household wastes. It will not break down in the environment, but may change forms. Airborne cadmium particles may travel long distances before falling to the ground or water. Animals and plants take up cadmium from the environment.

Federal regulations or recommendations regarding cadmium[h3]

Inorganic cadmium compounds are on the "List of Toxic Substances" managed under CEPA (Schedule 1). Cadmium is included in the *Hazardous Products (Glazed Ceramics and Glassware) Regulations*.

Cobalt (Co)[h2]

Cobalt is an element in nickel metal hydride and lithium ion batteries. In total, 70 tonnes of cobalt was sold into Canada within batteries in 2011.

What is cobalt?[h3]

In nature, cobalt is found in rocks, soil, water, plants, and animals. Cobalt can be used to produce alloys that are used to manufacture aircraft engines, magnets, grinding and cutting tools, and artificial hip and knee joints. Cobalt compounds are also used to colour glass, ceramics, and paints.

Exposure to cobalt[h3]
Exposure to low levels of cobalt can occur through breathing air, eating food, or drinking water. Food and drinking water are the primary sources of exposure to cobalt for the general population. Some level of exposure may also occur in those working in mining, smelting, or refining industries or in industries that process cobalt metal or ores or that produce cobalt alloys.

How cobalt affects humans[h3]
Cobalt can be beneficial or harmful to human health. High levels of cobalt exposure may result in lung and heart effects and dermatitis. Liver and kidney effects have also been observed in animals exposed to high levels of cobalt.

Non-radioactive cobalt has not been found to cause cancer in humans or animals following exposure through food or water.

Cobalt in the environment[h3]
Cobalt cannot break down, but it can change form or attach to or separate from particles. Cobalt might enter the environment from the burning of coal or oil or the production of cobalt alloys. Cobalt released into the air will associate with particles that may settle to the ground within a few days. Cobalt released into water or soil will stick to particles.

Federal regulations or recommendations regarding cobalt[h3]
There are no Canadian regulations or recommendations, but the International Agency for Research on Cancer (IARC) has determined that cobalt and cobalt compounds are possibly carcinogenic to humans.

Lithium (Li)[h2]
Lithium is present in lithium ion and lithium primary batteries. Batteries containing a total of 15 tonnes of lithium reached end of life in 2011.

What is lithium?[h3]
Since lithium is a natural earth metal, it is found in soils, rocks, dusts, surface water, ground water, and seawater. Because of its natural presence, it is found in plants, animals, food products, and beverages. Human-made products that contain lithium and industrial processes that involve lithium can produce higher concentrations in some areas than would be found under natural conditions.

Exposure to lithium[h3]
Everyone is exposed to lithium in food, beverages, air, and soil. Ingestion of lithium is normal, and it is probably beneficial to health at low doses. Most people get an average of 2 milligrams (mg) of lithium per day, mainly from their food. Lithium is excreted rapidly from the body through urine. Doctors may prescribe lithium chloride as a medication for patients with bipolar disorder. Typical

doses prescribed by doctors range from 140–1200 mg/day (50–600 times more than the average daily intake from food).[4]

How lithium affects humans[h3]

Ingested in excessive amounts, lithium primarily affects the gastrointestinal (GI) tract, the central nervous system, and the kidneys. Acute GI effects include abdominal pain, nausea, vomiting, and diarrhoea. Nervous system effects include tremors, loss of muscle coordination, muscle rigidity, and exaggerated reflexes. Sedation, mental confusion, agitation, seizures, and coma may occur at high doses. Symptoms associated with kidney toxicity include an initial increase in urine output (polyuria), subsequent elevation in blood non-protein nitrogen, and, finally, diminished urine output (oliguria). Inhalation of finely divided lithium particles may result in serious injury to the nasal passages, upper airways, and lungs due to the formation of lithium hydroxide (LiOH), a strong base that is highly corrosive.[5]

Inhaled lithium salts cause nasal and respiratory irritation. Lithium salt contact with skin or eyes can cause burns and irritation.

Oral exposure to excessive amounts of lithium, which occurs mainly when people are taking lithium as a medication, can cause tremors, weakness, convulsions, nausea, vomiting, diarrhoea, kidney failure, diabetes insipidus, or excessive thirst. Chronic oral exposure to high doses of lithium over time (e.g., at doses greater than 140 mg/day for medical treatment) can also disrupt the normal functioning of the thyroid gland, eventually leading to goitre (swelling of the thyroid gland) and hypothyroidism. Hypothyroidism is a disease in which the thyroid does not produce enough thyroid hormone. Symptoms of hypothyroidism include weight gain, muscle weakness, joint and muscle pain, depression, fatigue, brittle hair and fingernails, decreased senses of taste and smell, puffy face and hands and feet, slow speech, thickening of the skin, and thinning of the eyebrows. Lithium has also been shown to cause reproductive and developmental toxicity in animals at doses within the range that people receive who are being medicated with lithium.[6]

Lithium in the environment[h3]

Both lithium chloride and lithium sulphate have high water solubility, and the compounds will dissociate in aqueous environments. No lithium compounds are classified for adverse environmental effects. No data regarding the bioaccumulation of lithium was found, but, based on its low affinity to particles, it is not expected to bioaccumulate.

Lithium found naturally or from manufactured sources does not disappear or break down in the environment. It may combine with other materials, but it does not diminish or disappear unless it is physically removed by treatment processes.

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[4] Oregon Health Authority, *Technical Bulletin—Health Effects Information: Lithium* (Portland, OR: Office of Environmental Public Health, 2011), 3.

[5] H. Aral, A. Vecchio-Sadus, "Toxicity of lithium to humans and the environment—A literature review," *Ecotoxicology and Environmental Safety* 70(2008): 349–356. http://www.hkmacme.org/course/2009BW11-01-00/SP%20CS_Nov.pdf.

[6] Oregon Health Authority, *Technical Bulletin—Health Effects Information: Lithium* (Portland, OR: Office of Environmental Public Health, 2011), http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/Monitoring/Documents/health/lithium.pdf.

Federal regulations or recommendations regarding lithium[h3]
There are none, but there are some regulations about the transportation of lithium-containing batteries.

Aluminum (Al)[h2]
Small amounts of aluminum are present in lithium ion batteries. In 2011, 9 tonnes of aluminum was contained in Li-ion batteries that reached end of life.

What is aluminum?[h3]
Aluminum can be found in soil, rocks (particularly igneous rocks), and sometimes as aluminosilicate minerals. Aluminum does not exist in its pure form in the environment; it only exists in a combined state with other elements.

Aluminum compounds are used for water treatment, abrasives, and furnace linings. Powdered aluminum metal may be used in explosives and fireworks. Aluminum compounds are also used in consumer products such as foil and antiperspirants, over-the-counter and prescription drugs such as antacids, and food additives.

Exposure to aluminum[h3]
Exposure to aluminum can occur from eating food, drinking water, and consuming medicinal products such as antacids. Since aluminum is found in some topically applied consumer products such as antiperspirants, first aid antibiotics, and sunscreen and suntan products, exposure via skin contact also occurs.

Workers can inhale aluminum or otherwise be exposed to it during the refining of the primary metal or while employed in secondary industries that fabricate aluminum products or engage in aluminum welding.

How aluminum affects humans[h3]
The nervous system is the likeliest target for aluminum toxicity. Neurobehavioral tests of the motor function, sensory function, and cognitive function of animals exposed to alumimum have shown impaired performance. Animals exposed during gestation or lactation have also exhibited neurobehavioral alterations.

In some cases, aluminum workers have shown impaired lung function and fibrosis.

Aluminum in the environment [h3]
Aluminum cannot be destroyed in the environment. It can only change its form or become attached to or separated from particles. Aluminum is not bioaccumulated to a significant extent.

Federal regulations or recommendations regarding aluminum[h3]

Aluminum is listed as a "special case" in the *Guidelines for Canadian Drinking Water Quality.*[7] The Department of Health and Human Services has not classified aluminum for carcinogenicity. The International Agency for Research on Cancer (IARC) and the Environmental Protection Agency (EPA) have not classified aluminum for carcinogenicity. Available information has not shown that aluminum is a potential carcinogen.

Lead (Pb) [h2]

Trace amounts of lead are present in zinc carbon batteries. Lead makes up only 0.1% of the total weight of this battery chemistry. In 2011, the total tonnage of lead sold into the Canadian market in batteries was 4 tonnes.

What is lead? [h3]

Lead is a naturally occurring metal found in the earth's crust. Lead can be found in all parts of our environment.[8]

Exposure to lead [h3]

Humans can be exposed to lead by eating food or drinking water that contains lead, spending time in areas where lead-based paints have been used and are deteriorating, or working in a job where lead is used. There is no conclusive proof that lead causes cancer in humans.

How lead affects humans [h3]

Lead can affect nearly any organ and system in the body. The effects are identical whether it enters the body through breathing or swallowing. In both adults and children, the nervous system is the primary target for lead toxicity. The long-term exposure of adults to lead can result in the decreased performance of some functions of the nervous system. Lead exposure can also cause small increases in blood pressure, particularly in middle-aged and older people, and anaemia. High levels of exposure to lead can severely damage the brain and kidneys in adults or children and will ultimately cause death. In pregnant women, high levels of exposure can cause miscarriage. High-level exposure in men may cause damage to the sperm production organs.

Lead in the environment [h3]

Lead does not break down, but compounds of lead are altered by sunlight, air, and water. Lead that is released into the air may travel long distances before falling to the ground. Once lead falls to earth, it usually sticks to soil particles. Lead may move from soil to groundwater, depending on the type of lead compound and the characteristics of the soil.

Federal regulations or recommendations regarding lead [h3]

Lead was one of the first substances to be added to the "List of Toxic Substances" (Schedule 1) of the original *Canadian Environmental Protection Act* (CEPA). Several regulations regarding lead exist, and

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[7] Health Canada, *Guidelines for Canadian Drinking Water Quality*, http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php.

[8] Lead, *Agency for Toxic Substances and Disease Registry*, http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=22.

these cover the mining of lead, its use in fuel, its use in children's toys, the contamination of drinking water by lead, and many other matters.[9]

Silver (Ag)[h2]
Silver is 31%, by weight, of silver oxide button cell batteries. Four tonnes of silver was sold within these batteries in Canada in 2011.

What is silver?[h3]
Silver is a naturally occurring element. It is found in the environment combined with other elements such as sulfide, chloride, and nitrate. Silver is often found as a by-product during the retrieval of copper, lead, zinc, and gold ores. Silver is used to make jewellery, silverware, electronic equipment, and dental fillings, and it has many other uses.

Exposure to silver[h3]
One can be exposed to silver by breathing low levels in air (particularly while making jewellery with silver) or by ingesting it in drinking water, food, or medicines.

How silver affects humans[h3]
A condition called argyria, a blue-gray discoloration of the skin and other body tissues, may happen when one is exposed to high levels of silver for a long period of time. Argyria is a permanent effect, but it appears to be a cosmetic problem that may not be otherwise harmful to health. Lower-level exposures to silver may also cause silver to be deposited in the skin and other parts of the body; however, this is not known to be harmful.

Exposure to high levels of silver in the air can result in breathing problems, lung and throat irritations, and stomach pains. Skin contact with silver can cause a mild allergic reaction, such as a rash.

No studies are available on whether silver affects reproduction or causes developmental problems in people.

Silver in the environment[h3]
Natural processes such as the weathering of rocks or soil can cause silver to be released into the air and water. The burning of fossil fuel, the processing of ores, and cement manufacture are human activities that may release silver into the air. Silver does not appear to concentrate to a significant extent in aquatic animals.

The EPA has determined that silver is not classifiable as to human carcinogenicity.

Federal regulations or recommendations regarding silver[h3]
There are none.

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[9] Lead, *List of Toxic Substances Managed Under CEPA (Schedule 1)*, http://www.ec.gc.ca/toxiques-toxics/Default.asp?lang=En&n=98E80CC6-1&xml=D048E4B9-B103-4652-8DCF-AC148D29FB7D.

Mercury (Hg) [h2]
Mercury is present in small amounts in zinc air button cell batteries, and trace amounts are in silver oxide button cell batteries. Overall, less than half a tonne of mercury was sold into Canada within batteries in 2011.

What is mercury?[h3]
Metallic mercury is a shiny, silver-white, odourless liquid. Heated, it becomes a colourless, odourless gas. Mercury can combine with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," usually white powders or crystals. Mercury can also combine with carbon to make organic mercury compounds. The most common organic mercury compound is methyl mercury, produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methyl mercury that these small organisms make.

Exposure to mercury [h3]
One could be exposed to mercury by eating fish or shellfish contaminated with methyl mercury; by breathing vapours in air from spills, incinerators, and industries that burn mercury-containing fuels; through the release of mercury used in dental work and medical treatments; and by breathing contaminated workplace air or through skin contact during mercury use at work.

How mercury affects humans[h3]
The nervous system is very sensitive to all forms of mercury. Methyl mercury and metallic mercury vapours are the most harmful forms because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing foetus. Effects on brain functioning may result in memory loss or other problems. Short-term exposure to high levels of metallic mercury vapours may cause effects including lung damage, nausea, vomiting, diarrhoea, increases in blood pressure or heart rate, skin rashes, and eye irritation.

The EPA has determined that mercuric chloride and methyl mercury are possible human carcinogens.

Mercury in the environment[h3]
Inorganic mercury can enter the air from mining ore deposits, burning coal and waste, or manufacturing plants. It enters the water or soil from natural deposits, the disposal of wastes, or volcanic activity. Methyl mercury may be formed in water and soil by small organisms called bacteria, and this compound builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

Federal regulations or recommendations regarding mercury[h3]
Mercury is on the "List of Toxic Substances" managed under CEPA (Schedule 1). On February 26, 2011, Environment Canada published a proposed regulation under Part 5 of the *Canadian Environmental Protection Act* outlining proposed prohibitions on the import, manufacture, sale, and offer for sale of mercury-containing products. The final regulation is expected sometime in 2012.

Alkali [h2]
Alakali is present in zinc carbon, alkaline, nickel cadmium, nickel metal hydride, zinc air button cell, and silver oxide button cell chemistries. In 2011, 1,076 tonnes of alkali were present in batteries that reached end of life in Canada.

What is alkali?[h3]
The adjective alkaline is commonly used in English as a synonym for "base," especially for a soluble base. This broad use of the term is likely to have come about because alkalis were the first bases known to obey the Arrhenius definition of a base and are still among the more common bases.

The alkaline battery gets its name because it has an alkaline electrolyte of potassium hydroxide, instead of the acidic ammonium chloride or zinc chloride electrolyte of the zinc carbon batteries. Other battery systems also use alkaline electrolytes, but they use different active materials for the electrodes.

Potassium hydroxide is an inorganic compound with the formula KOH, commonly called caustic potash. It is used in batteries because of its reactivity toward acids and its corrosive nature.

Exposure to alkali[h3]
Exposure to potassium hydroxide could occur by breathing in contaminated air, through ingestion, or by skin or eye contact.

How alkali affects humans[h3]
When inhaled, potassium hydroxide is a respiratory tract irritant, and it may cause serious burns on acute contact. Severe injury is usually avoided by self-limiting coughing and sneezing symptoms. When ingested, it is corrosive to mucous membranes and may cause perforation of the oesophagus and stomach. Abdominal pain, nausea, vomiting, general gastrointestinal upset can be expected.

Skin contact will create irritation, soreness, and redness; the destruction of skin may result. Eye contact will result in irritation to eye tissues, tearing, redness, pain, and impaired vision.

Chronic exposure and prolonged contact with potassium hydroxide could lead to defatting dermatitis, a medical condition involving the chemical dissolving of dermal lipids from the skin. Continued irritation may lead to increased susceptibility to respiratory illness.

Sulfuric Acid (H_2SO_4)[h2]
Sulfuric acid is present in small sealed lead acid batteries. Roughly 63 tonnes of H_2SO_4 were contained in SSLA batteries that reached end of life in Canada in 2011.

What is sulfuric acid?[h3]
Sulfuric acid is a clear, colourless, oily liquid that is very corrosive. It is also called sulphine acid, battery acid, and hydrogen sulfate. It is used in the manufacture of fertilizers, explosives, other acids,

and glue; in the purification of petroleum; in the pickling of metal; and in lead acid batteries (used in most vehicles).

Exposure to sulfuric acid[h3]

One may be exposed to sulfuric acid working in the chemical or metal plating industry; producing detergents, soaps, fertilizers, or lead acid batteries; or working in printing and publishing or photography shops. Breathing outdoor air where coal, oil, or gas are burned; touching the material that forms on the outside of a car battery; or breathing air near a hazardous waste site where SO_3 is disposed of could also lead to a risk of exposure.

Sulfuric acid in the environment[h3]

Sulfuric acid dissolves in the water contained in air and can remain suspended in air for varying periods of time. It is removed from the air in rain. Sulfuric acid contributes to the formation of acid rain.

How sulfuric acid affects humans[h3]

Touching sulfuric acid will burn skin. Breathing sulfuric acid can result in both tooth erosion and respiratory tract irritation. Drinking sulfuric acid can burn ones mouth, throat, and stomach. It can result in death. It will cause watering and burning of the eyes.

People who have breathed in large quantities of sulfuric acid have shown an increase in cancers of the larynx. However, most of the people were also smokers who were exposed to other chemicals as well. The ability of sulfuric acid to cause cancer in laboratory animals has not been studied. The International Agency for Research on Cancer (IARC) has determined that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans.

Federal regulations or recommendations regarding sulfuric acid [h3]

There are none specifically about H_2SO_4, but all lead acid batteries are subject to the requirements of the Workplace Hazardous Materials Information System (WHMIS).[10]

[10] Health Canada, Workplace Hazardous Materials Information System (WHIMS), http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/index-eng.php.

Closing Note [Special Part---Epilogue]

Managing Canada's Waste Batteries was created to provide clarity and transparency to governments, industry, and the public on information relating to battery recovery and recycling in Canada. We hope that this report has helped inform the reader and illustrate the importance of data collection and independent reporting, as well as the differences in environmental impact of recycling and disposing of batteries.

The report aims to educate and promote best practices and encourage more recycling through enhanced collection and the high-value recovery of metals and elements.

Special Thanks [h1]

The gathering of accurate and detailed information, analysis, and peer review could not have been achieved without the generous assistance of certain individuals whose work supports battery and metals recycling in Canada.

A very special thank you to the following individuals:

Tamara Burns, Stewardship Ontario
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Duncan Bury, Duncan Bury Consulting
Robert Sinclair, Natural Resources Canada
Amy C. Tolcin, United States Geological Survey
Doug Panagapko, Natural Resources Canada
Ali Alavi, Horseheads
Kathy Bruce, Toxco Waste Management Ltd.

Subject	**Canada's Battery Recycling**
From	Clarissa Morawski
To	'Clarissa Morawski'
Sent	Wednesday, May 16, 2012 9:34 AM

For IMMEDIATE RELEASE
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CANADA'S BATTERY RECYCLING BOOST

NEW STUDY TAKES A CLOSER LOOK AT BATTERY RECYCLING PROGRAMS ACROSS THE COUNTRY

May 16, 2012, Peterborough, Ontario - New producer responsibility laws that regulate portable battery collection and recycling have been in place in British Columbia and Ontario since 2010 and in Manitoba since 2011. Quebec's program will commence this summer. Transparency and clarity on the performance of these new initiatives are critical to understanding the differences, strengths, and weaknesses of each program.

Managing Canada's Waste Batteries 2012 (*available at www.cmconsutlinginc.com*) reports, clarifies, and offers insight into the new battery collection and recycling programs in Canada. Clarissa Morawski, principal of CM Consulting and study author says, "We now have some data from program operators to see how well these programs are working, how they differ, and how to make them better. This information can help identify best practices for better performance through effective collection systems and efficient recycling technologies—technologies that maximize the output of valuable raw materials to be sold back to manufacturers, thereby replacing virgin feedstock."

Canada's battery recyclers continue to expand and evolve to meet the recycling demands of an ever-growing waste stream of batteries. There has been a surge in Li-ion battery sales, for example, and a subsequent increase in waste batteries needing proper management. Toxco-Canada based in Trail, BC and Raw Materials Company Inc. in Port Colborne, Ontario are two such companies with the capacity to recycle most of the portable batteries generated in Canada today.

"Our findings show that programs for primary (non-rechargeable) batteries saw gains in the number of kilograms collected for recycling, with Ontario collecting the highest number of batteries on a weight basis per capita (79 grams), followed by British Columbia (63 grams). Manitoba, in its first year of operation, collected 11 grams of primary batteries per capita," reports Morawski.

Managing Canada's Waste Batteries 2012 presents recent data and offers clarification on definitions of recovery and recycling rates, what they include and exclude, and how they relate to program performance. "This study is our response to the need of the public, government, and industry for transparency, data scrutiny, and clarity on this important subject," says Morawski.

The study is produced by CM Consulting as part of a series of performance reports on products currently designated under voluntary and regulated recycling programs. Other reports and articles can be found on our site: ***www.cmconsultinginc.com***.

###

LINK TO THE REPORT IS: http://www.cmconsultinginc.com/2012/05/battery-recycling-boost-cm-consulting-releases-study-reviewing-battery-recycling-programs-across-canada/

RE: Call2Recycle meeting in Victoria

Subject	**RE: Call2Recycle meeting in Victoria**
From	Tyson, Greg ENV:EX
To	'Orysia Boytchuk'
Cc	'Kristen Romilly'; Woodhouse, Christine A ENV:EX; Armstrong, Meegan ENV:EX
Sent	Wednesday, October 17, 2012 9:12 AM

Hi Orysia,

The branch has gone through a small re-org and there will likely be a new contact for you in our office. We should have more details by the time we meet up on Oct 25. I added agenda items to cover off introductions and o answer any questions Call2Recycle may have on the third party assurance project. If that is good we look forward to see you on Oct 25 at 2:30.

Agenda

- **MOE introductions**
- 2011 Annual Report
- 2012 activities and ytd
- Non-compliant companies (free riders list sent to MOE) status update
- 2013 targets and plan
- **Third party assurance**

Thanks,

Greg

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Sent: Wednesday, October 17, 2012 6:01 AM
To: Tyson, Greg ENV:EX
Cc: Kristen Romilly; Armstrong, Meegan ENV:EX; Woodhouse, Christine A ENV:EX; Bates, Julia ENV:EX; Smirl, Lyn ENV:EX
Subject: RE: Call2Recycle meeting in Victoria

Good morning:
Tuesday at 7:00 is great. We will make the reservation and hope you can make it - even if a bit later.
For the Thursday meeting – would you like to add anything to the agenda I originally sent?
Orysia

From: Tyson, Greg ENV:EX [mailto:Greg.Tyson@gov.bc.ca]
Sent: Tuesday, October 16, 2012 6:33 PM
To: Orysia Boytchuk
Cc: Kristen Romilly; Armstrong, Meegan ENV:EX; Woodhouse, Christine A ENV:EX; Bates, Julia ENV:EX; Smirl, Lyn ENV:EX

Subject: Call2Recycle meeting in Victoria

Hi Orysia

Not responsive

For the meeting, Thursday Oct 25 at 2:30 works excellent. Let's meet in the lobby of the conference and find a place to sit down. Attending will be Meegan Armstrong, Christine Woodhouse and myself.

For the

Greg Tyson
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
250 387 9774
Greg.Tyson@gov.bc.ca
www.recycling.gov.bc.ca

Join our Extended Producer Responsibility e-link mailing list
www.env.gov.bc.ca/epd/recycling/epr/index.htm

From: Orysia Boytchuk [mailto:oboytchuk@call2recycle.ca]
Sent: Monday, October 15, 2012 1:24 PM
To: Tyson, Greg ENV:EX
Cc: Kristen Romilly
Subject: RE: Meeting in Victoria

Hi Greg:
The session after lunch on Thursday is the one we sponsored so we would like to attend it. Would later in the afternoon work for you? Any time after 2:30.

Not responsive

Regards,
Orysia

From: Tyson, Greg ENV:EX [mailto:Greg.Tyson@gov.bc.ca]
Sent: Wednesday, October 10, 2012 7:48 PM
To: Orysia Boytchuk
Cc: Kristen Romilly
Subject: RE: Meeting in Victoria

Hi Orysia

How does the second day of the conference (Thursday) immediately after lunch work for you?

Thanks

Greg

Greg Tyson
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
250 387 9774
Greg.Tyson@gov.bc.ca
www.recycling.gov.bc.ca

Join our Extended Producer Responsibility e-link mailing list
www.env.gov.bc.ca/epd/recycling/epr/index.htm

From: Orysia Boytchuk [mailto:oboytchuk@call2recycle.ca]

Sent: Monday, October 8, 2012 6:44 PM
To: Tyson, Greg ENV:EX
Cc: Kristen Romilly
Subject: Meeting in Victoria

Hi Greg:
I'm hoping we can book a meeting time during the CWMA conference. Both Kristen and myself will be there. Here is a rough agenda:

- 2011 Annual Report
- 2012 activities and ytd
- Non-compliant companies (free riders list sent to MOE) status update
- 2013 targets and plan

This is just a rough draft – please feel free to add. I would expect we need approx. 1 hour and I will send a more formal agenda the week before our meeting.
Let us know a day and time that would work for you.

Not responsive

We're looking forward to seeing you all again!
Regards,
Orysia

Orysia Boytchuk
Marketing Director, Call2Recycle®
Recharging the planet. Recycling your batteries.™

416.224-0141 ext 229 1.866.794.7272 | oboytchuk@call2recycle.ca | www.call2recycle.ca

- **Please consider the environment before printing this email**

RE: Call2Recycle

Subject	**RE: Call2Recycle**
From	Jack Bradbury
To	Tyson, Greg ENV:EX
Sent	Monday, October 22, 2012 3:20 PM

Thanks Greg, appreciate the links and conversation.
Jack

From: Tyson, Greg ENV:EX [mailto:Greg.Tyson@gov.bc.ca]
Sent: Monday, October 22, 2012 3:09 PM
To: 'jack@allbatterysalesandservice.com'
Subject: Call2Recycle

As discussed

Annual report http://www.env.gov.bc.ca/epd/recycling/electronics/reports/pdf/rbrcc-2010.pdf

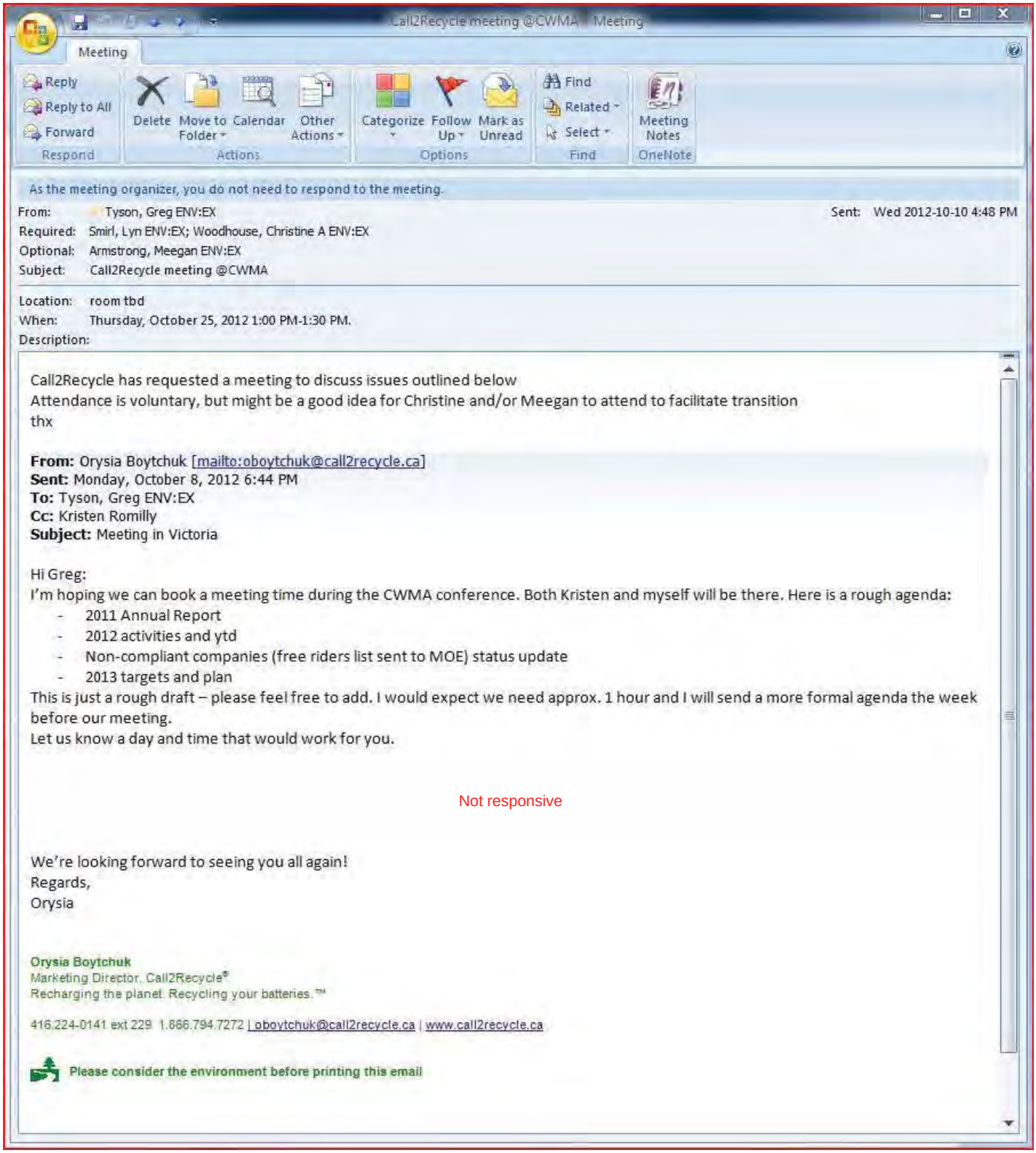
Stewardship plan http://www.env.gov.bc.ca/epd/recycling/electronics/pdf/call-plan-feb04.pdf

Thanks

Greg

Greg Tyson
BC Ministry of Environment
250 387 9774
Greg.Tyson@gov.bc.ca

Canceled: Call2Recycle meeting @CWMA



Call2Recycle meeting @CWMA - Meeting

Meeting

Reply | Reply to All | Forward — Respond
Delete | Move to Folder | Calendar | Other Actions — Actions
Categorize | Follow Up | Mark as Unread — Options
Find | Related | Select — Find
Meeting Notes — OneNote

As the meeting organizer, you do not need to respond to the meeting.

From: Tyson, Greg ENV:EX
Sent: Wed 2012-10-10 4:48 PM
Required: Smirl, Lyn ENV:EX; Woodhouse, Christine A ENV:EX
Optional: Armstrong, Meegan ENV:EX
Subject: Call2Recycle meeting @CWMA

Location: room tbd
When: Thursday, October 25, 2012 1:00 PM-1:30 PM.
Description:

Call2Recycle has requested a meeting to discuss issues outlined below
Attendance is voluntary, but might be a good idea for Christine and/or Meegan to attend to facilitate transition
thx

From: Orysia Boytchuk [mailto:oboytchuk@call2recycle.ca]
Sent: Monday, October 8, 2012 6:44 PM
To: Tyson, Greg ENV:EX
Cc: Kristen Romilly
Subject: Meeting in Victoria

Hi Greg:
I'm hoping we can book a meeting time during the CWMA conference. Both Kristen and myself will be there. Here is a rough agenda:

- 2011 Annual Report
- 2012 activities and ytd
- Non-compliant companies (free riders list sent to MOE) status update
- 2013 targets and plan

This is just a rough draft – please feel free to add. I would expect we need approx. 1 hour and I will send a more formal agenda the week before our meeting.
Let us know a day and time that would work for you.

Not responsive

We're looking forward to seeing you all again!
Regards,
Orysia

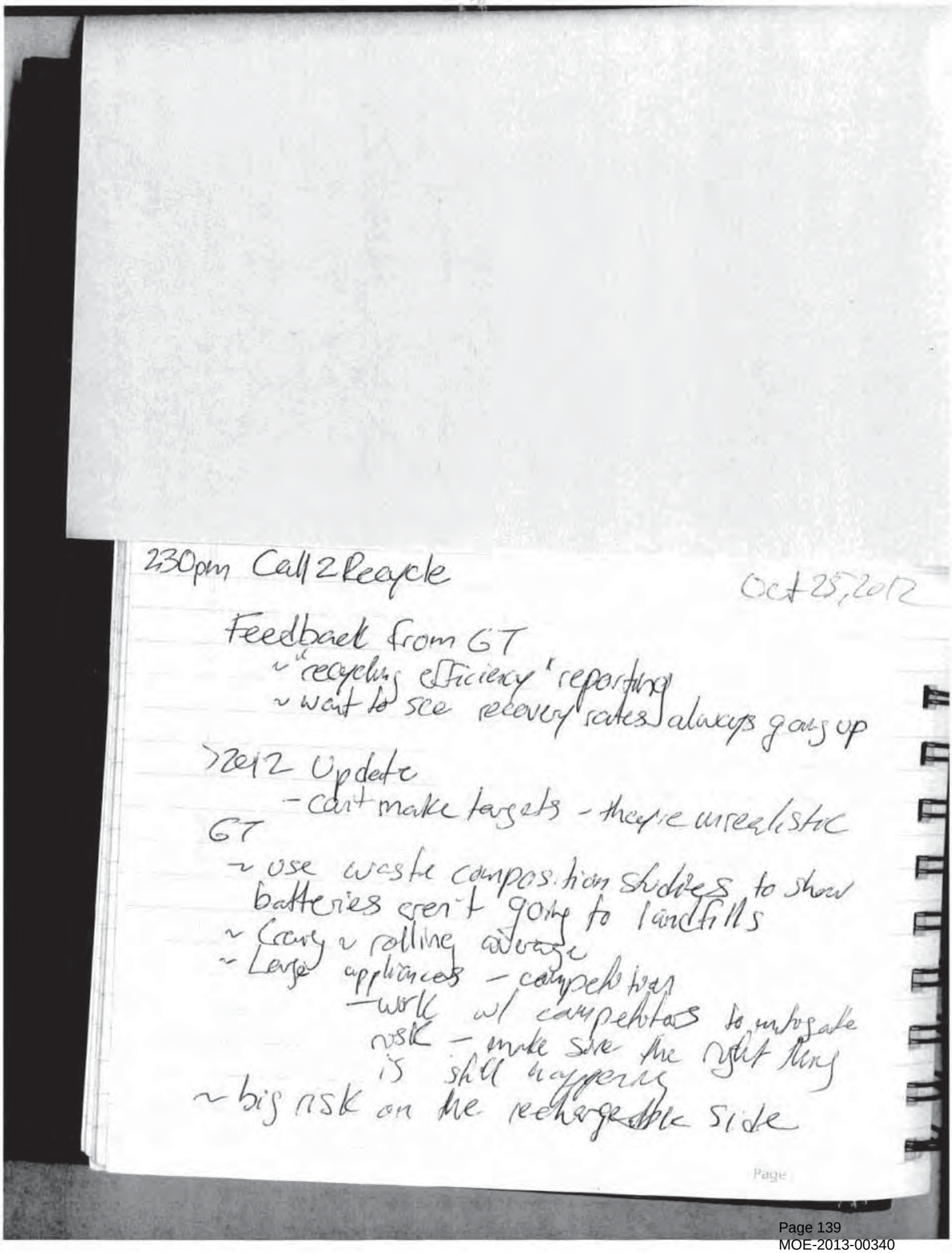
Orysia Boytchuk
Marketing Director, Call2Recycle®
Recharging the planet. Recycling your batteries.™

416.224-0141 ext 229 1.866.794.7272 | oboytchuk@call2recycle.ca | www.call2recycle.ca

Please consider the environment before printing this email

Page 137 redacted for the following reason:
- - - - - - - - - - - - - - - - - - - -
Not responsive

Not responsive



230pm Call 2 Recycle Oct 25, 2012

Feedback from GT
- "recycling efficiency" reporting
- want to see recovery rates always goes up

>2012 Update
- can't make targets - they're unrealistic

GT
- use waste composition studies to show batteries aren't going to landfills
- Carry a rolling average
- Large appliances - competitors
  - work w/ competitors to mitigate risk - make sure the right thing is still happening
- big risk on the rechargeable side

Page

Subject	**transition**
From	Tyson, Greg ENV:EX
To	Woodhouse, Christine A ENV:EX
Cc	Armstrong, Meegan ENV:EX
Sent	Wednesday, October 24, 2012 4:28 PM
Attachments	Battery Re… RE Amazon EPRA unac… ESABC Un… RE Your su… TELUS Am…

Hi Christine/Meegan

Items that are on the go that will need a new home. I have hard copy of folders with relevant documents/files on my desk. I've arranged these in a kind of priority order below.

Come by if you like to discuss any of this over the next day or so s.22
Thanks

1. **Ongoing stewardship plan oversight**
   Required action
   Monitor and oversee plan performance. Provide support/information to plan holders and/or public as required.

   Approved/operating plans

   Not Responsive

   c. Batteries and Cell phones – RBRCC - Call2Recycle

.

Not Responsive

Not Responsive

3. **Call2Recycle and EPRA compliance with "duty of producer"**

Call2Recycle forwarded approx 40 suspected battery producers that they believe are selling in BC without a stewardship plan (e-mail attached). Craig Wisehart of EPRA also forwarded one suspected non-compliant producer (e-mail also attached).

Required action:

a. Prepare MOE letter to all ID'd producers requesting information on their compliance status (DONE CLIFF 178773).
b. Track responses and follow up with those that do not respond. (A TRACKING SHEET HAS BEEN PREPARED filename: Non-compliant Orgs Tracking Oct 2012.xls)
c. Follow up by telephone with producers that do not respond to get a response.
d. Review status of each producer with Call2Recycle/EPRA and develop an action plan to achieve compliance if required.

Contacts are Orysia Boytchuck oboytchuk@call2recycle.ca and Craig Wisehart cwisehart@esabc.ca

Not Responsive

Greg Tyson
BC Ministry of Environment
250 387 9774
Greg.Tyson@gov.bc.ca

Dunn, Paula ENV:EX

From: Orysia Boytchuk [oboytchuk@call2recycle.ca]
Sent: Friday, August 17, 2012 10:44 AM
To: Tyson, Greg ENV:EX
Subject: Battery Recycling - Non-compliant
Attachments: Non-compliant Orgs 8 2012.xlsx

Good afternoon Greg;
I am following up on our conversation regarding non-compliant organizations.

The Rechargeable Battery Recycling Corporation of Canada (RBRCC), which operates the Call2Recycle® program is seeking your assistance with respect to the enforcement of recycling requirements for batteries. Attached you will find a list of companies that are failing to comply with industry standards and requirements.

As the recognized steward of the battery program for the province of British Columbia, Call2Recycle has contacted or attempted to contact the companies listed to participate in our program or ascertain if they have set up their own programs. The companies listed are not licensees of RBRCC, therefore not part of our program, and to the best of our knowledge have no recycling program of their own. Therefore, we are requesting your formal intervention and assistance with respect to these companies.

Should you have any questions or require more information please contact me at your convenience.

Thank you for assistance.

Orysia

Orysia Boytchuk
Marketing Director, Call2Recycle®
Recharging the planet. Recycling your batteries.™

416.224-0141 ext.229 | 1.866.794.7272 | oboytchuk@call2recycle.ca | www.call2recycle.ca

Dunn, Paula ENV:EX

From: Armstrong, Meegan ENV:EX
Sent: Wednesday, September 26, 2012 10:46 AM
To: 'Craig Wisehart'; Tyson, Greg ENV:EX
Subject: RE: Amazon

Hi Craig,

Greg will assist you with this request. We are drafting similar letters for other programs.

C. Meegan Armstrong
T: 250.387.9944

From: Craig Wisehart [mailto:craig.wisehart@eprassociation.ca]
Sent: Wednesday, September 26, 2012 9:56 AM
To: Armstrong, Meegan ENV:EX
Subject: Amazon

Hi Meegan

Requesting assistance from the Ministry on dealing with a producer of electronics is always our avenue of last resort but we have been attempting to get a response from Amazon and cannot get them to even acknowledge our letters or calls.

We have sent several letters over the last 4 months and received no reply. Our registered letter was returned. It appears that none of the other provincial programs have been successful in signing Amazon up with the exception of Alberta who told me that only came about after 'ongoing communication with their lawyers.' It appears that they were able to leverage their close affiliation to the Alberta government which is something unique to the Alberta program.

The program manager in Alberta did give me a contact (information below) and I have left several voicemails but have not received a reply. Amazon was likely obligated back to the earlier phases but clearly their Kindle line of e-book readers and tablets are obligated products under Phase V and we need to get them to compliant with the regulation to ensure a level playing field for those other suppliers of similar materials.

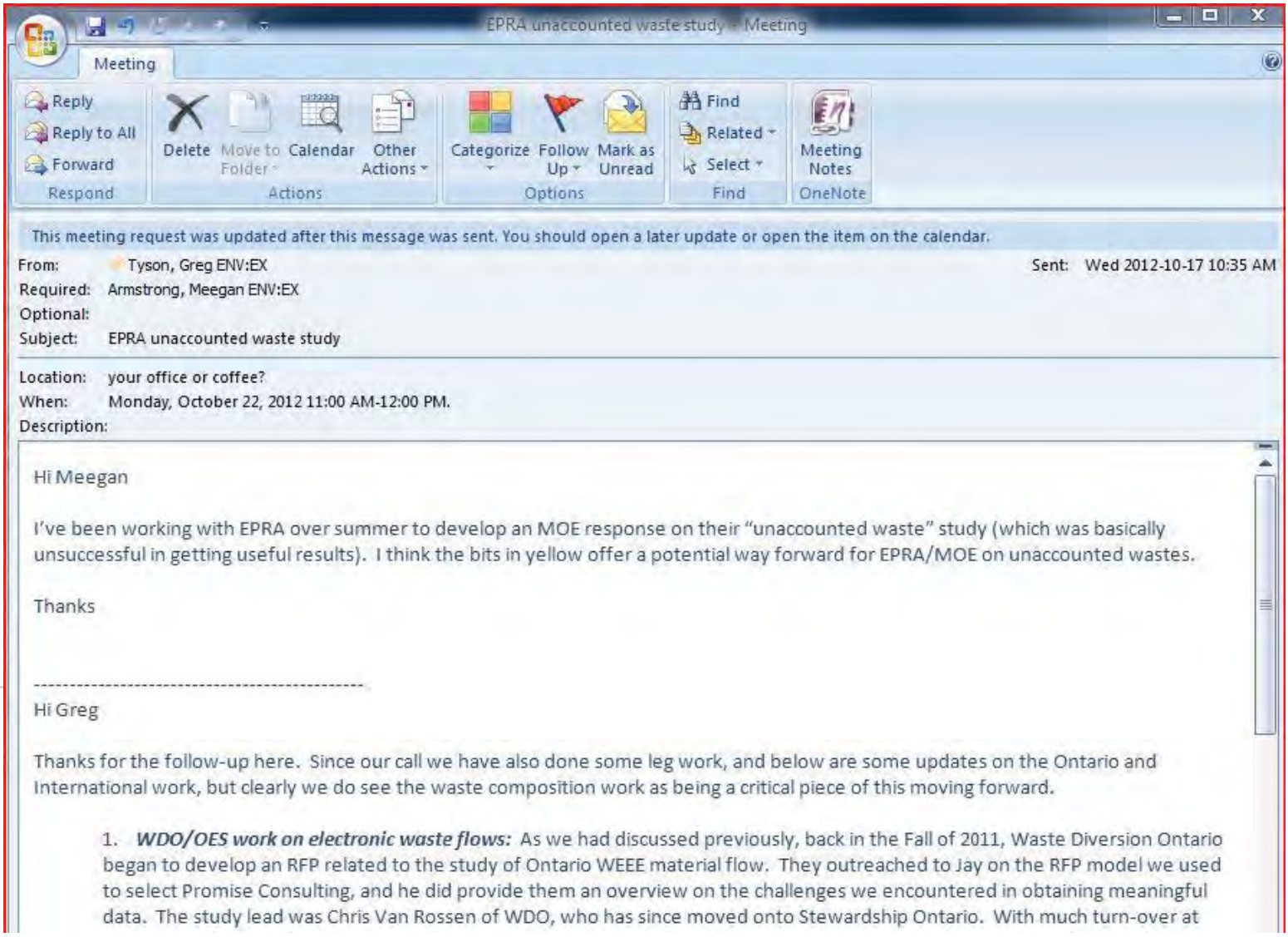
I am requesting the Ministry's assistance in ensuring that this producer is compliant with the BC regulations regarding Extended Producer Responsibility. Attached is a copy of the last letter that we sent along with the contact information given to us by the program in Alberta.

Brandon Solberg
Buyer/Vendor Manager, Canada Electronics
333 Boren Ave N
SEA28 12 Fl, 230.D5
Seattle, WA
98109
Tel. no. (206) 266-0463

As I said, coming to the Ministry is an unusual step for us but this is a large producer and it is unfair to our many complying stewards not to pursue Amazon on this matter. If you need anything else or I can be of assistance, please let me know. Thanks.

Craig Wisehart
Executive Director
Electronic Products Recycling Association
206 – 2250 Boundary Road

Burnaby, BC V5M 3Z3
Phone: (604) 291-1002
Fax: (604) 291-1004
website: : www.esabc.ca


EPRA unaccounted waste study - Meeting
Meeting
Reply
Reply to All
Forward
Respond
Delete
Move to Folder
Calendar
Other Actions
Actions
Categorize
Follow Up
Mark as Unread
Options
Find
Related
Select
Find
Meeting Notes
OneNote
This meeting request was updated after this message was sent. You should open a later update or open the item on the calendar.
From: Tyson, Greg ENV:EX
Sent: Wed 2012-10-17 10:35 AM
Required: Armstrong, Meegan ENV:EX
Optional:
Subject: EPRA unaccounted waste study
Location: your office or coffee?
When: Monday, October 22, 2012 11:00 AM-12:00 PM.
Description:
Hi Meegan
I've been working with EPRA over summer to develop an MOE response on their "unaccounted waste" study (which was basically unsuccessful in getting useful results). I think the bits in yellow offer a potential way forward for EPRA/MOE on unaccounted wastes.
Thanks

Hi Greg
Thanks for the follow-up here. Since our call we have also done some leg work, and below are some updates on the Ontario and International work, but clearly we do see the waste composition work as being a critical piece of this moving forward.
1. WDO/OES work on electronic waste flows: As we had discussed previously, back in the Fall of 2011, Waste Diversion Ontario began to develop an RFP related to the study of Ontario WEEE material flow. They outreached to Jay on the RFP model we used to select Promise Consulting, and he did provide them an overview on the challenges we encountered in obtaining meaningful data. The study lead was Chris Van Rossen of WDO, who has since moved onto Stewardship Ontario. With much turn-over at

WDO recently, we followed up with Chris back in September and he informed us that the RFP was never issued, in part because of the Minister`s requirement for financing model work took precedent, but also in large part due to a realization by their folks on the complexities of this issue. Chris does not expect this will be back on the WDO`s radar screen anytime soon.

2. ***EPA/MIT work on Characterizing Trans-boundary Flows of Used Electronics***: As we have underlined, much of the illegal flow (a likely sizeable portion of what is in scope here) of electronics needs to be understood at an international scale. The leading edge of research in this area is a joint initiative of the US EPA, and a number of European nations through the STeP initiative. At the Dallas eScrap event this year the North American roundtable of electronics stewardship executives which Jay chaired was able to get a special update from two of the principles of this work (Jason Linnell of the NCER, and Reed Miller of MIT). The preliminary findings of this work can be found here, but the overall direct message to our roundtable was this is still early days in the research. We underlined our commitment to help understand this issue better, and offered to look at becoming partners in future research phases. I will also add to this point that we do have a rep from the Vancouver office of Environment Canada`s illegal exports group on our newly formed Local Advisory Committee, who should be able to keep us up to speed with developments/findings in that area.

While we are as interested as the Ministry in knowing the fate of all end-of-life electronics, it does not look like there is a practical way to get complete information on that. As I indicated earlier, we believe that the most important information will come from the waste composition studies. The amount of electronic waste ending up in provincial landfills is the data that is most relevant to both of us and if we can quantify and reduce that volume, our primary purpose will be realized.

Craig Wisehart
Executive Director
Electronic Products Recycling Association
206 – 2250 Boundary Road
Burnaby, BC V5M 3Z3
Phone: (604) 291-1002
Fax: (604) 291-1004
website: : www.esabc.ca

From: Tyson, Greg ENV:EX [mailto:Greg.Tyson@gov.bc.ca]
Sent: October-12-12 7:17 PM
To: 'craig.wisehart@eprassociation.ca'; 'jay@estewardship.ca'
Subject: RE: Unaccounted Waste Study

Hi Craig/Jay

We talked by phone a few weeks back re: the EPRA unaccounted waste study and the challenges faced by your consultant. We were looking for alternative ways to get a sense of what the situation might look like in BC.

I agreed to look into the status of the solid waste characterisation methodology. I think you guys were going to check on the status of studies on e-waste flows in Ontario and the US.

Maryam Moffidpoor (of MOE) advises that the waste composition study methodology has been tested at the Nanaimo Regional District and in the North Okanagan Regional District and that they are in the process of ironing out some issues identified in these pilots. A final product is expected in Jan/Feb of 2013.

Any update from your end on the Ontario and USEPA studies?

Thanks

Greg

Greg Tyson
BC Ministry of Environment
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
250 387 9774
Greg.Tyson@gov.bc.ca
www.recycling.gov.bc.ca

Join our Extended Producer Responsibility e-link mailing list
www.env.gov.bc.ca/epd/recycling/epr/index.htm

From: Tyson, Greg ENV:EX
Sent: Tuesday, July 17, 2012 1:32 PM
To: 'Craig Wisehart'
Subject: FW: Unaccounted Waste Study

Hi Craig

Thanks for this. We will consider the output of the study referenced in the letter and get back to you to discuss. Thanks

Greg

Greg Tyson
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
250 387 9774
Greg.Tyson@gov.bc.ca
www.recycling.gov.bc.ca

Join our Extended Producer Responsibility e-link mailing list
www.env.gov.bc.ca/epd/recycling/epr/index.htm

From: Armstrong, Meegan ENV:EX

Sent: Wednesday, July 4, 2012 4:50 PM
To: Tyson, Greg ENV:EX
Cc: Woodhouse, Christine A ENV:EX
Subject: FW: Unaccounted Waste Study

Greg,

Over to you to acknowledge receipt.

C. Meegan Armstrong | A/Section Head - Industry Product Stewardship |
Environmental Quality Branch | Ministry of Environment
3rd Floor - 2975 Jutland | Victoria BC | V8W 9M1
T: 250.387.9944

From: Craig Wisehart [mailto:cwisehart@esabc.ca]
Sent: Tuesday, July 3, 2012 9:17 AM
To: Armstrong, Meegan ENV:EX
Cc: Lawes, David ENV:EX; Tyson, Greg ENV:EX; Jay Illingworth
Subject: Unaccounted Waste Study

Hi Meegan

I wanted to follow up in a letter to you on our earlier discussions on the unaccounted waste study that we commissioned last year. If you have any questions or concerns, let me know.

Craig Wisehart
Executive Director
Electronic Products Recycling Association
206 – 2250 Boundary Road
Burnaby, BC V5M 3Z3
Phone: (604) 291-1002
Fax: (604) 291-1004
website: : www.esabc.ca

ESABC Un…

June 28, 2012 Via e-mail

C. Meegan Armstrong
Head, Industry Product Stewardship
Ministry of Environment
3rd Floor - 2975 Jutland Road
Victoria, BC V8W 9M1
Meegan.Armstrong@gov.bc.ca

Dear Meegan:

As we discussed at our meeting last November in Vancouver, I wanted to formally follow-up with you on the issue of ESABC's work related to understanding the complexities of "unaccounted" electronic waste in British Columbia.

As you will recall, during our June 2010 presentation of the harmonized performance measurement work ESABC had undertaken with its sister programs across Canada, a key finding of the report was that capture rates (an annual estimate of the % of waste electronics collected vs. new products of the same variety put into the market) was not a reasonable measure for durable goods such as electronics, with very long service lives. At the time, we agreed that while the reporting on a capture rate was not applicable, the program would endeavour to research and report in 2011 on the identification and examination of current practices for handling or disposing of regulated end-of-life electronics not collected by ESABC and thus "unaccountable" to ESABC. A similar research report was undertaken by the stewardship program for used motor oil in BC in 2006.

In the spring of 2011 ESABC issued an open request for proposal (RFP) to select a contractor to define, research, quantify and report on unaccounted, regulated waste/end-of-life electronics in the province of British Columbia. This RFP was won by Promise Consulting of Mission, BC.

Over the summer and fall of 2011, Promise engaged internal resources and a number of sub-contractors to:

a) Analyze what constitutes "unaccounted end-of-life electronics" for Phase I & II regulated electronics, as covered by the ESABC program, and;
b) Develop and implement a detailed research methodology and strategy for defining and reviewing current:
   - Potential channels/destinations for EOLE (*where is it going?*);
   - Range of final uses (*what is happening to it?*)
   - Quantities of this non-ESABC collected EOLE (*how much of it is there?*)

Early into the research it became very apparent that given the complexity of the products in question, a strong residual value for these products in illegal export markets and a number of other unique issues, this task was not going to be as simple as the used oil research model it was based upon. Once again, the issues of the long service life, perceived value, etc which impacts the capture rate skew the ability for the used oil model to work for our products.

In the end, the contracted research did not yield any findings that we felt were supported by relevant data to the situation in British Columbia. Accessible, accurate data was impossible to source, and interviews with key stakeholders were difficult to undertake as often the subject matter was seen as sensitive due to the illegal export issue, or proprietary in a commercial sense. In addition, a major data gap exists on EOLE going into municipal landfills.

While EPRA is not in a position to provide detailed estimates of unaccounted waste, we remain committed to exploring and reporting on this issue moving forward. EPRA will continue to invest in researching and reporting on this issue. There are three related initiatives we will be looking to partner on moving forward:

1. *Municipal Waste Estimates:* EPRA is working closely with the BC Stewards initiative to encourage a comprehensive research approach to the composition of municipal waste being sent to landfills across the province.
2. *Related Canadian Research:* We understand that Waste Diversion Ontario will be issuing an RFP shortly to examine WEEE material flows in Ontario, with the intent to characterize waste electronic flows and channels in Ontario. EPRA has already provided our "lessons learned" here, and will work closely with OES officials as this research moves forward.
3. *Transboundary Flows:* In September of 2011 the US Environmental Protection Agency (EPA), announced a new $2.5m grant to help finance the creation of the first-ever comprehensive inventory of the country's e-waste output. Under leadership of the Massachusetts Institute of Technology and the National Center for Electronics Recycling, the project will directly co-operate with electronics manufactures. EPRA has contacted the NCER on potential research linkages to the Canadian market.

EPRA looks forward to continuing to work with you as our program plans for further expansion, while maintaining high environmental standards and providing comprehensive reporting on and verification of program metrics in a fully accountable and transparent manner.

Yours truly;

Craig Wisehart
Executive Director, EPRA BC

Cc: David Lawes, Manager, Community Waste Management
Greg Tyson, Environmental Stewardship Policy Analyst
Jay Illingworth, Director of Harminazation, EPRA

Dunn, Paula ENV:EX

From: Keith Caldwell [Keith.Caldwell@TELUS.COM]
Sent: Monday, June 25, 2012 3:52 PM
To: Tyson, Greg ENV:EX
Cc: Paul Lown; Barb Collins
Subject: TELUS Amended Phase 5 Stewardship Plan
Attachments: TELUS Amended Ewaste Stewardship Plan (including Phase 5) July 1 2012 (Final v2).pdf

Follow Up Flag: Follow up
Due By: Friday, June 29, 2012 4:30 PM
Flag Status: Completed

Hi Greg,
Please find attached our final post public consultation Plan for Phase 5. During the consultation phase we received only one question. The question came from CAll2Recycle and they wanted to know who our processers where for consumer batteries. We provided the list to Call2Recycle's Kristen Romilly.

As always, let me know if you have any questions or feedback.
Thanks

Keith Caldwell | Manager, Purchasing & Inventory Management | Tel (604) 432-2373| Mobile (780) 984-9812
TELUS - Supply Chain National Spares & Reverse Logistics

Call2Recycle.

Subject	**Call2Recycle.**
From	Armstrong, Meegan ENV:EX
To	Tyson, Greg ENV:EX; Woodhouse, Christine A ENV:EX
Sent	Thursday, October 25, 2012 7:49 AM

Greg,
Can u sent me a few bullets on Call2 Recycles 2011 annual Report - is what they reported as collect what where their targets - any issues raised I forgot to print their annual report yesterday to see where they at - have a look at meeting bullets below and if u can give me any other tibits I need to know....thanks!
Meegan Armstrong
Sent from Blackberry

FW: Call2Recycle non-compliant producers project

Subject	**FW: Call2Recycle non-compliant producers project**
From	Tyson, Greg ENV:EX
To	Woodhouse, Christine A ENV:EX
Sent	Thursday, October 25, 2012 9:49 AM
Attachments	TR Environme... Letter Ref 178773 Reference No. 17877... Battery Recycling ... FW BC Recycling ... Letter reference ...

Another Call2Recycle compliance response is attached (shoppers drug mart). Sorry about clutter.

From: Tyson, Greg ENV:EX
Sent: Thursday, October 25, 2012 9:42 AM
To: Woodhouse, Christine A ENV:EX
Subject: Call2Recycle non-compliant producers project

Hi Christine

Attached are messages from producers responding to our letter asking for clarification on their compliance status.

Responses are trickling in and will require follow up. Since the letter had my e-mail address as a contact, I will need to forward the e-mails to somebody who can take the necessary action to respond/follow up. Responses will likely be coming in writing and/or by e-mail.

Should I forward these to you? Lyn? Meegan?

Thanks

Greg Tyson
BC Ministry of Environment
250 387 9774
Greg.Tyson@gov.bc.ca

Dunn, Paula ENV:EX

From: Sylvain Messier [smessier@jeancoutu.com]
Sent: Tuesday, October 23, 2012 11:45 AM
To: Tyson, Greg ENV:EX
Cc: Andrée Soucy
Subject: TR: Environmental Management Act

Hello Greg,

Such as we have just discussed, this e-mail aims at specifying that none of the batteries imported from China by the Jean Coutu Group stays in BC. Every single battery is forwarded to Québec or Ontario. As mentioned below : The Corporation operates a network of 399 franchised stores located in the provinces of Québec, New Brunswick and Ontario. We have no store in BC thus we make none business over there.

With this information, I hope that this case will be settled.

Please confirm.

Sylvain Messier
Coord.sen.prog.etiq.conf.regl.
Publicité Et Achat
Tél. : (450) 646-9611 poste 1822
Avant d'imprimer, pensez à l'environnement.

De : Sylvain Messier
Envoyé : 17 octobre 2012 16:21
À : 'Greg.Tyson@gov.bc.ca'
Cc : Andrée Soucy
Objet : Environmental Management Act

Good afternoon M. Tyson,

I've tried to reach you by phone. This is regarding the registered mail that you have sent to Mr Éric Burnstun on October 3, 2012 (reference : 178773).

The Jean Coutu Group (PJC) inc. does business in the pharmacy retailing. The Corporation operates a network of 399 franchised stores located in the provinces of Québec, New Brunswick and Ontario. We have no store in BC thus we make none business over there. We import goods from China, and probably the goods arrive in BC but everything is sent either in Québec or in Ontario as we have 2 warehouses.

Thereby, we think that we must not be subjected to your regulations.

You would be kind to confirm my understanding and that this case is closed.

Sincerely Yours.

Sylvain Messier
Coord. Senior prog. étiquetage/conformité régl.
Publicité Et Achat
Le Groupe Jean Coutu (PJC) inc.
530, rue Bériault, Longueuil, Québec, J4G 1S8
Tél. : (450) 646-9611 poste 1822
Télécopieur : (450) 646-2991
smessier@jeancoutu.com

Sylvain Messier
Senior Coordinator, labelling & Compliance prog.
Advertising And Purchasing
The Jean Coutu Group (PJC) Inc.
530, Beriault St. Longueuil, Quebec, J4G 1S8
Tel.: (450) 646-9611 ext. 1822
Fax: (450) 646-2991
smessier@jeancoutu.com

Avant d'imprimer, pensez à l'environnement.

Please consider the environment before printing this email.

Dunn, Paula ENV:EX

From: Wuihan Cheah (CTI-FW) [wcheah@csb-battery.com]
Sent: Monday, October 22, 2012 2:06 PM
To: Tyson, Greg ENV:EX
Cc: Ken Smith (CTI-FW); Sergio Lan (CTI-FW)
Subject: Letter Ref: 178773

Hi Greg,

Thanks for taking the time to talk to me this morning regarding the subject matter above. Per our conversation, CSB a VRLA battery manufacturer only and we do not make any other primary/secondary batteries (alkaline, NiCd, Lithium, etc). We ship limited VRLA batteries to our clients in BC however, CSB does not import directly into BC. CSB does not have an official place of doing business or a registered entity in BC.

It's our understanding that CSB is exempt from the BC Reg 449/2004 and that regulations would fall on our clients that sell, offer to sell, distribute or use in a commercial enterprise a product, in BC.

Should you have questions, please do not hesitate to let us know.

Thank you and have a great day.

Kindest Regards,
Wuihan Cheah
Regional Sales Manager
CSB Battery Technologies, Inc.
http://www.csb-battery.com/
wcheah@csb-battery.com

817-887-6410 - Direct
817-244-4445 - Fax
817-366-6913 - Cell

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Dunn, Paula ENV:EX

From: Paige Smith (Positec US) [Paige.Smith@positecgroup.com]
Sent: Tuesday, October 23, 2012 12:00 PM
To: Tyson, Greg ENV:EX
Cc: Bud Duncan (Positec US); Sharon Kent (Positec US)
Subject: Reference No. 178773 Positec North America
Attachments: PTC Response to BC Recycle Letter dated 10032012.pdf

Dear Mr. Tyson,

Please find attached our response to your letter dated October 3, 2012. If you have any questions or need additional information, please do not hesitate to contact me at the number below.

Sincerely,

Paige Smith
Executive Assistant

Positec Tool Corporation | 10130 Perimeter Parkway Suite 300, Charlotte, NC 28216
P: 704.599.3711 X 118
paige.smith@positecgroup.com
www.positectoolgroup.com

Notice:
Please send your emails to Paige.Smith@positecgroup.com
@positecusa.com will not be in use starting March 1, 2013

Dunn, Paula ENV:EX

From: Ideker,Bill [Bill.Ideker@eaglepicher.com]
Sent: Tuesday, October 23, 2012 12:01 PM
To: Tyson, Greg ENV:EX
Cc: Nowlin,Ron; emily.russell@eaglepicher.com; Shaw,Dave
Subject: Battery Recycling Letter
Attachments: BC Letter102412.doc

Dear Mr. Tyson,

I have attached a response letter for your review and a hard copy will follow in the mail. I appreciate the information during our phone conversation and your willingness to work with our company. Please feel free to contact me if you would like to discuss.

Best Regards,
Bill

William C Ideker
Manager of Environmental Affairs
EaglePicher Technologies, LLC
P.O. Box 47
Joplin, MO 64801
417-623-8000 Ext. 347

Dunn, Paula ENV:EX

From: Oliver Young [oliver@gpbattery.com]
Sent: Thursday, October 25, 2012 9:14 AM
To: Tyson, Greg ENV:EX
Cc: anna@gpbattery.com
Subject: FW: BC Recycling Regulation Ref.178773

Attn: Mr. Greg Tyson.

Dear Mr. Tyson

We acknowledge the receipt of your letter dated 3rd Oct, 2012 Ref 178773.

Based on the review of the attached copies of the recycling regulations with our company lawyer and accountant, we believe that we have
no obligations under Section 2 (Part 1) of the Recycling Regulation.

In British Columbia, we are not a producer or an importer . We are a retailer.

Thank you.

Oliver Young
GP Battery Marketing Inc.
25 Oct 2012

Dunn, Paula ENV:EX

From: Shabbir Beawerwala [sbeawerwala@shoppersdrugmart.ca]
Sent: Wednesday, October 17, 2012 1:22 PM
To: Tyson, Greg ENV:EX
Subject: Letter reference No 178773 to Shoppers Drug Mart
Attachments: SDM_RBRC_Recycling Batteries 9172012.pdf

Hello Greg

We have been in contact with Call2Recycle and we are registered with them for 3 provinces i.e. BC, Quebec and Manitoba.

Call2Recycle tells me that we can file a return annually and pay the levy. I will keep following up for the return filing and payment deadline and we assure you we will meet our obligation to full extent.

I attach our agreement with Call2Recycle for your information and record.

Thank you

Shabbir Beawerwala | Environmental Compliance | **SHOPPERS DRUG MART/PHARMAPRIX**
243 Consumers Road | Toronto, Ontario | M2J 4W8 | (416) 493-1220 x 5896 | sbeawerwala@shoppersdrugmart.ca

RE: Call2Recycle meeting in Victoria

Subject	**RE: Call2Recycle meeting in Victoria**
From	Tyson, Greg ENV:EX
To	Armstrong, Meegan ENV:EX
Sent	Thursday, October 25, 2012 1:53 PM

See you at the Bengal Lounge, 2:30.

From: Armstrong, Meegan ENV:EX
Sent: Thursday, October 25, 2012 1:53 PM
To: Tyson, Greg ENV:EX
Subject: Re: Call2Recycle meeting in Victoria

Thanks so much!
Meegan Armstrong
Sent from Blackberry

From: Tyson, Greg ENV:EX
Sent: Thursday, October 25, 2012 01:48 PM
To: Armstrong, Meegan ENV:EX
Subject: FW: Call2Recycle meeting in Victoria

Some info for the meeting as requested

Agenda

- **MOE introductions**
  - s.22 introduce new contact (if known)
  - Commit to transition support
- 2011 Annual Report
  - Letter to come responding o report. Timing unclear.
  - Report looks good, encouraged that collection has increased.
  - Look forward to support Call2Recycle as they work to improve over time
- 2012 activities and ytd
  - Call2Recycle to lead
- Non-compliant companies (free riders list sent to MOE) status update
  - Letters sent first week Oct requesting response by Nov 2.
  - Some responses received, most are looking to have retailers and/or distributors assume responsibility
  - It will be an ongoing process to complete this task and we will need to work with Call2Recycle to prioritise responses to each producer based on approx amount sold in BC (pursue the biggest first).
- 2013 targets and plan
  - Call2Recycle to lead
- **Third party assurance**
  - Confirm they are all good with their progress or if they could use assistance from KPMG/MOE

Call2Recycle compliance response

Subject	**Call2Recycle compliance response**
From	Tyson, Greg ENV:EX
To	Armstrong, Meegan ENV:EX
Sent	Thursday, November 1, 2012 1:11 PM
Attachments	 RE transition

Hi Meegan

Attached is a response from a battery producer that Call2Recycle indicated may have unmet obligations under the Recycling Regulation in BC. Not sure who the file lead is for this stuff. Could you forward to the appropriate person. This is part of the transition task #3 in my Oct 24 e -mail (attached for reference)

Thanks

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Vctoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca

FW: Call2Recycle compliance response

Subject	**FW: Call2Recycle compliance response**
From	Tyson, Greg ENV:EX
To	Armstrong, Meegan ENV:EX
Sent	Thursday, November 1, 2012 1:13 PM
Attachments	 RE transition  BB Battery USA Recycl...

e-mail attached from B&B Battery. Thanks

From: Tyson, Greg ENV:EX
Sent: Thursday, November 1, 2012 1:11 PM
To: Armstrong, Meegan ENV:EX
Subject: Call2Recycle compliance response

Hi Meegan

Attached is a response from a battery producer that Call2Recycle indicated may have unmet obligations under the Recycling Regulation in BC. Not sure who the file lead is for this stuff. Could you forward to the appropriate person. This is part of the transition task #3 in my Oct 24 e -mail (attached for reference)

Thanks

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Vctoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca

Dunn, Paula ENV:EX

From: Byron Close [byron@bb-battery.com]
Sent: Thursday, November 1, 2012 11:52 AM
To: Tyson, Greg ENV:EX
Subject: B&B Battery USA Recycling compliance
Attachments: DOC121031.pdf; DOC121101.pdf.pdf

Dear Mr. Tyson,

We have received your notification of recycling requirement for British Columbia (first attachment.) Please note that we are not aware who is F. Eskandari, so please remove that name from your file. I would be your window of contact regarding any correspondence of this matter.

B&B Battery Co does have a recycling program in place. Please refer to our program details as enclosed in the second attached file. Should you have any question or comment, please be sure to let me know.

Please acknowledge receipt of this email.

Thank you.

Best Regards,

Byron Close
Director of Sales & Marketing
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
B&B BATTERY (USA) INC.
6415 Randolph St.
Commerce, CA 90040
U.S.A
(800) 278-8599 Ext. 113
(323) 278-1900 Ext. 113
(323) 278-1268 Fax
byron@bb-battery.com
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

FW: Call2Recycle compliance response

Subject	**FW: Call2Recycle compliance response**
From	Tyson, Greg ENV:EX
To	Armstrong, Meegan ENV:EX
Sent	Friday, November 2, 2012 11:23 AM

Hi Meegan

Attached below is another response from for the Call2Recycle producer compliance project.

Let me know when decisions have been made as to who will take this project on and I will send responses I receive directly.

Cheers and have a nice weekend.

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Victoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca

-----Original Message-----
From: Dr. Josef Daniel-Ivad [mailto:josef@pevi.ca]
Sent: Friday, November 2, 2012 9:27 AM
To: Tyson, Greg ENV:EX
Subject: Your letter Ref #: 178773

To:

BC Ministry of Environment
Environmental Standards Branch
Attn: Greg Tyson

Dear Greg,

I am in receipt of your registered mail letter addressed to Mark Strathern at Pure Energy Battery Inc. inquiring about Pure Energy Battery Inc.'s status under the BC Recycling Regulation 449/2004.

Please be advised that the company Pure Energy Battery Inc. is no longer in business and as such is not a producer under the BC Recycling Regulation.

Further, I would like to advise that Pure Energy batteries are being produced by PES Canada Inc. - Pure Energy Solutions (Canada) Inc. and this is the company that can be considered as the producer under the regulation. Pure Energy Solutions has joined the call2recycle stewardship program and is as such fulfilling the duties under the stewardship plan.

Please let me know in case of further question. In any event, I would appreciate an acknowledgement of your receipt of this letter by return e-mail. Thank you.

Sincerely yours,
Josef

--

_____

Dr. Josef Daniel-Ivad
CTO - Energy Storage Solutions
Pure Energy Solutions Inc.
Battery Lab: 30 Pollard Street, Richmond Hill, Ontario, L4B 1C3, CANADA
Mfg Plant: 41 Tantramar Crescent, Amherst, Nova Scotia, B4H 4J6, CANADA
phone: 905-707-9577 x231; mobile: 289-221-5035; fax: 905-707-7435
e-mail: josef@pevi.ca; web: www.pureenergy.com

Dunn, Paula ENV:EX

From: Jay.Taylor@schneider-electric.com
Sent: Wednesday, November 7, 2012 7:04 PM
To: Tyson, Greg ENV:EX
Subject: Reference 178733

Mr. Tyson,

I received your request for information this week, I acknowledge receipt, s.22 s.22 returning to West Kingston next Thursday November 17th 2012. I am in communication with my colleagues there on the best answer for your questions.

Jay

Jay Taylor | APC by Schneider Electric | IT Business Unit Director of Global Standards, Codes & Environment
Cell: +1 512-818-2073 | Email: jay.taylor@apc.com

RE: Call2Recycle compliance response

Subject	RE: Call2Recycle compliance response
From	Tyson, Greg ENV:EX
To	Armstrong, Meegan ENV:EX
Cc	Paul, Bob A ENV:EX
Sent	Thursday, November 8, 2012 10:00 AM

Thanks Meegan

I will send to you until things are finalised.

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Victoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca

From: Armstrong, Meegan ENV:EX
Sent: Thursday, November 8, 2012 9:18 AM
To: Paul, Bob A ENV:EX
Cc: Tyson, Greg ENV:EX
Subject: FW: Call2Recycle compliance response

Greg- Bob Paul has the cell/battery files. I'll send you a list when finalized of who is managing what or alternatively just keep sending to me.

C. Meegan Armstrong
T: 250.387.9944

From: Tyson, Greg ENV:EX
Sent: Thursday, November 8, 2012 9:17 AM
To: Armstrong, Meegan ENV:EX
Subject: RE: Call2Recycle compliance response

Hi Meegan

Attached is another response from a battery producer that Call2Recycle indicated may be a producer selling in BC without a stewardship program.

Has there been any decision on who will be handling the Call2Recycle file yet?

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Victoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca

From: Tyson, Greg ENV:EX
Sent: Thursday, November 1, 2012 1:14 PM
To: Armstrong, Meegan ENV:EX
Subject: FW: Call2Recycle compliance response

e-mail attached from B&B Battery. Thanks

From: Tyson, Greg ENV:EX
Sent: Thursday, November 1, 2012 1:11 PM
To: Armstrong, Meegan ENV:EX
Subject: Call2Recycle compliance response

Hi Meegan

Attached is a response from a battery producer that Call2Recycle indicated may have unmet obligations under the Recycling Regulation in BC. Not sure who the file lead is for this stuff. Could you forward to the appropriate person. This is part of the transition issues in my Oct 24 e-mail (attached for reference)

Thanks

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Vctoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca

RE: Call2Recycle compliance response

Subject	**RE: Call2Recycle compliance response**
From	Paul, Bob A ENV:EX
To	Tyson, Greg ENV:EX
Cc	Armstrong, Meegan ENV:EX
Sent	Tuesday, November 20, 2012 3:28 PM

Hi Greg, thanks for forwarding the emails regarding the above. I will bcc on the responses.

Bob

From: Tyson, Greg ENV:EX
Sent: Tuesday, November 20, 2012 3:05 PM
To: Paul, Bob A ENV:EX
Cc: Armstrong, Meegan ENV:EX
Subject: FW: Call2Recycle compliance response

Hi Meegan/Bob

Another response to the Call2Recyle potential non-compliant producer project.

Since my name is given as a contact person on the MOE request, can I ask to get a "bcc" on the responses? Thanks

Thanks

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Victoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca

From: Jeffrey Atwater [mailto:JAtwater@gtspower.com]
Sent: Tuesday, November 20, 2012 12:51 PM
To: Tyson, Greg ENV:EX
Subject: British Columbia recycling requirements

Greg,

I am the Controller at Global Technology Systems, Inc. We design and develop high performance mobile power solutions. Our headquarters are in Framingham, MA and we have an R&D and distribution center in West Palm Beach, FL. We received a letter from the Environmental Standards Branch of British Columbia regarding B.C. Reg 449/2004 which covers manufacturers' recycling requirements.

We are actively working to put a plan in place to meet these requirements. This plan will include finalizing an agreement with the Rechargeable Battery Recycling Corporation (RBRC) to facilitate the recycling of covered batteries. In addition we are working with our lead acid vendors to ensure any lead acid batteries we sell that may not be part of the RBRC program will be covered by an appropriate recycling plan.

Should you have any questions, please do not hesitate to contact me.

Thanks,
Jeffrey Atwater

Jeffrey Atwater
Corporate Controller
Global Technology Systems, Inc.
550 Cochituate Road
Framingham, MA 01701

jatwater@gtspower.com
(508) 907-6676 [Office]
(508) 650-5472 [Fax]
www.GTSpower.com

Call2Recycle compliance project

Subject	**Call2Recycle compliance project**
From	Tyson, Greg ENV:EX
To	Armstrong, Meegan ENV:EX
Sent	Thursday, November 29, 2012 4:14 PM
Attachments	 Letter re UPG and t...

Hi Meegan

Attached is another response on the Call2Recycle compliance project.

The writer mentions a notification that was apparently sent to MOE in July. I do not recall seeing anything. It should be clarified with Call2Recycle if UPG is a member company.

As with the other letters, please ask the file lead (Bob?) to bcc me when responding to these so I can be sure the correspondence that was addressed to me has been handled.

Thanks

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Victoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca

Dunn, Paula ENV:EX

From: Cindy Carmack [carmackc@upgi.com]
Sent: Thursday, November 29, 2012 3:22 PM
To: Tyson, Greg ENV:EX
Subject: Letter re: UPG and the Recycling Regulation - Dated October 3, 2012

Good evening Greg,

We have received the above mentioned letter regarding the Recycling Regulation in British Columbia. Honestly, we were surprised to receive the letter as we mailed a letter to the Environmental Quality Branch in August 2010 appointing Call2Recycle to act on our behalf in carrying out our duties under Part 2 of the Recycling Regulation.

Do you have the letter? If not, we will provide an updated one.

Thank you!

Cindy Carmack
Executive Assistant
UPG
1720 Hayden Drive
Carrollton, TX 75006
P: 469.892.1169
F: 469.892.1199

RE: Call2Recycle compliance project

Subject	**RE: Call2Recycle compliance project**
From	Paul, Bob A ENV:EX
To	Armstrong, Meegan ENV:EX
Cc	Tyson, Greg ENV:EX
Sent	Thursday, November 29, 2012 4:21 PM

Hi Meegan, I do not see the attachment that Greg is referring to. Greg, please send again.

Thanks
Bob

From: Armstrong, Meegan ENV:EX
Sent: Thursday, November 29, 2012 4:16 PM
To: Paul, Bob A ENV:EX
Subject: RE: Call2Recycle compliance project

C. Meegan Armstrong
T: 250.387.9944

From: Tyson, Greg ENV:EX
Sent: Thursday, November 29, 2012 4:15 PM
To: Armstrong, Meegan ENV:EX
Subject: Call2Recycle compliance project

Hi Meegan

Attached is another response on the Call2Recycle compliance project.

The writer mentions a notification that was apparently sent to MOE in July. I do not recall seeing anything. It should be clarified with Call2Recycle if UPG is a member company.

As with the other letters, please ask the file lead (Bob?) to bcc me when responding to these so I can be sure the correspondence that was addressed to me has been handled.

Thanks

Greg

Greg Tyson
BC Ministry of Environment
4th Flr 395 Waterfront Crescent
Victoria BC V8T 5K7
T 250 387-9491
Greg.Tyson@gov.bc.ca