

The Canadian Battery Association's British Columbia Stewardship Plan for Lead-Acid Batteries

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Table of Contents

EXECUTIVE SUMMARY	4
1 INTRODUCTION.....	5
1.1 REGULATORY REQUIREMENTS.....	5
1.2 ABOUT LEAD-ACID BATTERY USE IN BRITISH COLUMBIA	5
1.3 POPULATION DISTRIBUTION IN BRITISH COLUMBIA.....	6
2 PROGRAM ADMINISTRATION	7
2.1 THE CANADIAN BATTERY ASSOCIATION	7
2.2 PROGRAM GOALS, OBJECTIVES AND PRINCIPLES.....	7
2.3 ORGANIZATION STRUCTURE AND MANAGEMENT IN BC.....	8
2.4 ACCOUNTABILITY AND TRANSPARENCY	8
2.5 DISPUTE RESOLUTION.....	9
2.6 REPORTING AND REVIEW	10
2.7 FINANCING MECHANISM.....	10
3 PRODUCT LIFE CYCLE MANAGEMENT.....	11
3.1 PRODUCT LIFE CYCLE MANAGEMENT	11
3.1.1 <i>Lead</i>	11
3.1.2 <i>Electrolyte</i>	12
3.1.3 <i>Casing</i>	12
4 STAKEHOLDER CONSULTATION	12
5 PERFORMANCE MEASURES	13
5.1 RECOVERY RATES.....	13
5.1.1 <i>Lead-Acid Battery Sales</i>	13
5.1.2 <i>Recovery</i>	14
5.1.3 <i>Recovery Rate</i>	15
5.2 AWARENESS.....	16
5.2.1 <i>Consumer Awareness Studies</i>	16
5.2.2 <i>Consumer and Commercial Outreach</i>	17
5.3 ACCESSIBILITY.....	19
5.3.1 <i>Urban Communities</i>	19
5.3.2 <i>Rural Communities</i>	19
5.3.3 <i>Remote Communities and Remote Locations</i>	20
5.4 GENERATION, STORAGE AND TRANSPORTATION	20
5.4.1 <i>Generation, Storage and Transportation</i>	21
5.4.2 <i>Training and Education of Employees</i>	21
5.4.3 <i>Inspection of Recycling Infrastructure</i>	22
5.5 RESIDUALS MANAGEMENT	22
5.5.1 <i>Reuse</i>	22
5.5.2 <i>Recycling</i>	23
5.5.3 <i>Landfill</i>	24
6 PROGRAM MANAGEMENT	25
6.1 PROGRAM EFFICIENCY	25
6.1.1 <i>Stewardship Agencies of BC</i>	25
6.1.2 <i>Call2Recycle</i>	25
6.1.3 <i>Automotive Recyclers Environmental Association</i>	26
6.2 QUALITY OF SERVICE.....	26
6.3 MANAGEMENT PERFORMANCE	26

6.3.1	<i>Financial Audit</i>	26
6.3.2	<i>Non-Financial Audit</i>	27
6.3.3	<i>Reporting</i>	27
7	PRIORITIES FOR NEXT 5 YEARS	28
7.1	<i>Partnership with Call2Recycle</i>	28
7.2	<i>Rural Communities</i>	29
7.3	<i>Remote and First Nation Communities</i>	29
7.4	<i>Health and Safety</i>	30
7.5	<i>Improved Data Verification of Private Recycling Network</i>	30
	APPENDIX 1: CONSULTATION SUMMARY FOR CANADIAN BATTERY ASSOCIATION	31
	APPENDIX 2: BC REGIONAL DISTRICT AND MUNICIPAL ANALYSIS FOR CBA RETURN COLLECTION FACILITIES	32

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Executive Summary

The Canadian Battery Association (CBA) has operated a Stewardship Program in Canada since 2011 and in 2015 the CBA and Interstate Battery Systems merged their Stewardship Programs into one comprehensive LAB Stewardship Program for Canada. As of January 1, 2016, the CBA's members account for more than 95% of the LAB's sold in British Columbia. The remaining 5% of LABs are sold in BC as a LAB within a new product – eg boat, motorcycle etc or the LAB that is imported directly from the USA or Asia by commercial operations into BC without a Stewardship Program as required by the Recycling Regulation.

Every year, there are approximately 20,000,000 kg of lead-acid batteries (LABs) sold in BC by CBA members. Approximately 87.5% of the LABs are sold to consumers for use in vehicles and commercial trucks. The remaining 12.5% are motive LABs such as forklifts and golf carts and stationary LABs for energy storage and power backup. The motive and stationary LABs are business-to-business commercial transactions.

The CBA's Stewardship Program provides for a return-to-retail recovery program for consumer (ie automotive) LABs and a business-to-business recovery program for commercial LABs. Recovered consumer and commercial LABs will be transported to warehouse locations operated by CBA members using a reverse-distribution system and then the waste LABs will be bulk transported to smelters for recycling.

The LAB recovery rate by CBA members in 2015 is approximately 75% and is based on sales and recovery data collected from CBA members; however, the overall Product Recovery Rate is approximately 109% when the non-ferrous recyclers that recycle LABs outside the CBA's Stewardship Program are factored into the overall LAB Recovery Rate.

The CBA's collection network has a network of 180 retail return collection facilities that cover the urban and rural parts of British Columbia and there are 20 warehouse facilities operated by CBA members that collect industrial batteries from commercial operations.

Because of the relatively stable commodity price for recycled lead, the CBA will not require a visible eco-fee on the purchase of LABs. The demand for lead provides sufficient economic incentive to recover LABs in urban and rural areas. Remote communities are a difficult challenge and the CBA is working with Indian and Northern Affairs Canada and other Stewards to ensure that LABs are recovered in remote First Nation communities.

1 Introduction

The Canadian Battery Association (CBA) has developed a National Stewardship Program for all lead-acid batteries (LABs) and the Stewardship Plan for British Columbia has been submitted to the BC Ministry of Environment under Part 2 of the *Recycling Regulation*.

1.1 Regulatory Requirements

The *Environmental Management Act* and the *Recycling Regulation* is the regulatory framework in British Columbia that requires the stewardship of LABs.

In addition, there are a variety of Acts and Regulations that will have an influence on the development and implementation of the CBA's Stewardship Plan. Those Acts and Regulations are:

- *The Canadian Environmental Protection Act*
- *The Transportation of Dangerous Goods Act;*
- *The Environmental Management Act's Hazardous Waste Regulation;*

These acts and regulations will be integrated into the CBA's Stewardship Plan.

1.2 About Lead-Acid Battery Use in British Columbia

Lead acid batteries (LABs) are important in the daily lives of every person in British Columbia. LABs are used to:

- Start our internal combustion engines such as vehicles, buses, boats, recreational vehicles, trucks etc.
- Provide uninterrupted power for our computers, telecommunication systems, safety systems (e.g., emergency lighting, fire alarms) and data centres;
- Provide motive power for forklifts, scooters and carts;
- Store power for alternative energy applications.

LABs range in size from less than 1 kg in small medical and emergency systems to 17 kg in an average passenger battery to thousands of kilograms in commercial applications like forklifts and emergency backup systems for data centres.

Because of the wide range of LABs, the stewardship plan groups the LABs into the following 3 categories:

Category	Size (kg)	Typical Application
Starting Lighting and Ignition (SLI)	<1 – 10	Emergency Lighting, Fire Sensors, Motorcycles, ATVs
	10 – 20	Vehicle – Passenger & Light Truck
	25 -50	Vehicle - Commercial Truck
Motive	30 – 1500	electric forklifts, golf carts
Stationary	50 – 50,000	large power supply and emergency back-up

The average life span of a LAB varies depending on their design, application and maintenance. Vehicle and commercial truck batteries are designed to last approximately 60 months. Motive batteries (e.g., used in forklifts, golf carts) are a different design and are expected to last 7 years while Stationary batteries that typically serve as emergency or reserve power are much larger and can last for more than 20 years.

Approximately, 87.5% of LABs are SLI type batteries sold for vehicle and commercial truck applications. The remaining 12.5% are for motive and stationary applications.

1.3 Population Distribution in British Columbia

One of the key challenges of a Stewardship Plan is to provide accessibility to the consumer – especially in rural and remote communities.

The population of British Columbia in 2015 according to Statistics Canada was 4.6 million people. Approximately 88% of the population live in cities, towns or Regional Municipalities with a population greater than 1,000 people.

One of the challenges of a product stewardship program in BC will be providing recovery services to the smaller rural communities. Fort Nelson on the Alaska Highway (population 4,300) and Port Clements on Haida Quaii (population 432) are important locations as they represent extreme rural location and a transportation challenge for the stewardship plan. Monitoring of the LAB recovery in these locations will provide a measure of the effectiveness of the Stewardship Program in rural and remote areas.

2 Program Administration

2.1 The Canadian Battery Association

The Canadian Battery Association (CBA) is a Federally-registered Not-for-Profit Industry Association. The CBA members account for more than 95% of the LAB sales in Canada and British Columbia. As an Industry Association, the CBA does more than Stewardship programs and the Association works on other initiatives with the Canadian Standards Association and Underwriters Laboratories Canada.

The CBA has three objectives:

- provide members with an efficient and effective stewardship program that meets their Federal and Provincial regulatory requirements;
- collect and collate the data and information required by the stewardship programs; and,
- ensure the stewardship program is cost-efficient, comprehensive, and consumer-focused that includes a reverse-distribution retail and commercial return collection system.

The members of CBA are listed on the www.canadianbatteryassociation.ca. The CBA membership includes national and regional distributors, smelters and recyclers.

Retailers such as NAPA, Canadian Tire etc., are not required to become signatories to the CBA's Stewardship Plan because their National distributors have assumed their stewardship obligations.

2.2 Program Goals, Objectives and Principles

The goals of the Canadian Battery Association's Stewardship Program are:

- Provide a program that is convenience to consumers, retailers and customers of lead-acid batteries;
- Provide a National stewardship program that meets the regulatory requirements of individual provinces;
- Promote the safe recovery, storage and transportation of new, used and waste lead-acid batteries.

The principles of the CBA Stewardship Program are:

- Integrate the Stewardship Program into the recycling initiatives of CBA members where possible;
- Develop solutions that can be implemented across Canada;

- Do not interfere with the free market for the sale and collection of new, used or waste LABs;
- Use reverse-distribution systems to minimize transportation costs and ecological footprints;
- Develop solutions that meet corporate, social, environmental and economic goals of its members and regulatory agencies;

2.3 Organization Structure and Management in BC

The CBA is managed across Canada by its Executive Director. The Executive Director is responsible for the preparation and implementation of the Stewardship Plan.

The administrative and implementation functions of the CBA include:

- development and updating of the CBA's Stewardship Plan;
- preparing reports for regulatory agencies, Board of Directors and stakeholders;
- preparing the communication materials for distribution;
- overseeing budgets and developing strategies and actions designed to meet Performance Measures (see Section 6).
- undertaking stakeholder consultation and managing the BC Steering Committee;
- assisting CBA members to meet all Federal and Provincial regulatory requirements for the safe collection, storage and transportation of LABs;
- resolving disputes and investigating complaints;

The CBA has a simple governance model. The Executive Director provides all the management and operational programs for the CBA. The CBA's Board of Directors oversees the Executive Director and is comprised of the six national representatives as well as 4 other members that represent manufacturers, distributors and smelters in Canada.

2.4 Accountability and Transparency

The CBA provides accountability and transparency through a variety of mechanisms. The primary mechanism is the Financial and Non-Financial Audit of the Stewardship Program. These audits are published on the CBA website and are available to the public.

In addition, the CBA has become an active supporter of the Recycling Council of BC (RCBC) and the Stewardship Agencies of BC (SABC). In addition, the CBA participates in conferences, forums and recycling programs that further the awareness of the CBA and the recycling of LABs.

In addition, the CBA website (www.canadianbatteryassociation/bc.ca) will have an entire section devoted to British Columbia's:

- Overview of BC Stewardship Program including current recovery rates, health and safety information, location of battery recycling depots;
- Administrative information including financial information and the Stewardship Plan in downloadable format;
- The environmental story for lead acid batteries including the fate of lead-acid batteries, electrolyte and plastic;
- Forms and procedures for CBA members; and,
- Contact information.

Finally, the BC based businesses that sell LABs in British Columbia form a BC Steering Committee. The Steering Committee ensures that Province-specific issues are reflected in the BC's Stewardship Program. The purpose of the British Columbia Steering Committee is to:

- Identify local and provincial issues that will need to be addressed in the Stewardship Plan;
- Provide BC sales and recovery data as outlined in by CBA policy;
- Participate in events to recover lead-acid batteries in rural and remote locations.

2.5 Dispute Resolution

There are three dispute resolution stages utilized by the CBA to resolve differences between two parties.

First Stage:

The first stage is to encourage the two parties to come to a fair resolution of the issue. Should any one of the parties be unsatisfied with the outcome of this stage, they must provide in writing to the CBA that the first stage of the dispute resolution procedure has not been successful.

Second Stage:

The CBA will take an active role in the mediation between the two parties. During this stage, the two parties will have an opportunity to describe the problem to the CBA and the CBA will generate options and a recommendation for consideration by the two parties. Should any one of the parties be unsatisfied with the outcome of this stage, they must provide in writing to the CBA that the second stage of the dispute resolution procedure has not been successful.

Third Stage:

In the event that no resolution has been reached, the CBA will appoint a qualified mediator or an arbitrator under the Arbitration Act. The cost of the mediator and the remaining costs will be borne equally by the two parties.

In the event that the CBA is a party in the dispute, then Stage 2 would be by-passed because the CBA is a party in the dispute.

2.6 Reporting and Review

The CBA will review its Stewardship Program every five years and submit an updated stewardship plan to the Ministry of Environment for approval.

In addition, the CBA will prepare an annual budget for its national and provincial programs that will be available to the regulatory agencies upon request.

2.7 Financing Mechanism

The development, implementation and administration of the CBA Stewardship Program for Lead-Acid Batteries (LABs) will be borne by the members of the CBA through an annual membership fee.

The membership fee will be set to ensure that the costs of the Stewardship Program for British Columbia are covered and a contingency budget is available for extraordinary circumstances. The membership fees will be reviewed each year and approved at the CBA's Annual General Meeting.

Consumers will not be charged an eco-fee at the retail level. Eco-fees are not required because the demand for recycled lead provides sufficient value for Stewards in British Columbia to collect, transport and recycle LABs in urban and rural parts of British Columbia.

The current commodity price of lead is \$2 per kg on the London Metal Exchange. An average vehicle battery weighing 17kg has approximately 10 kg of lead valued at close to \$20 per battery. Because automotive LABs have a 5 year life expectancy, there is a significant demand for new automotive batteries and this demand drives the commodity value for recycled lead.

Because of the significant commodity value of the LAB, there is an active industry of secondary lead recyclers that pursue the collection and recycling of LABs.

To compete with independent lead recyclers, some CBA members employ several strategies to ensure the collection of LABs. The strategies used include:

- implementing a business-to-business core charge (deposit) / core credit programs at the wholesale level to encourage the return of LABs from the retailer to the manufacturer. Typically these core charges / core credits programs are \$10 to \$15 per automotive battery with greater amounts for larger battery sizes and they are a business-to-business program that is not passed on to the consumer;
- purchasing LABs from private recyclers and commercial operations;
- organizing special collection of LABs through sweeps and events that promote recycling activities of LABs. (e.g., Exide's Annual Earth Day Event).

3 Product Life Cycle Management

3.1 Product Life Cycle Management

This section summarizes the fate of the products, residuals and commodities. Lead-acid battery technology has been around for 150 years and its three basic components are all 100% recyclable. The following sections outline the fate of the lead-acid batteries and the numbers are taken from Battery Council International's brochure titled: Sustainability/Recycling.

3.1.1 Lead

The primary component of a LAB is lead and the recycling of LABs is essential for the battery industry as there is not sufficient virgin lead product to supply the lead-acid battery market.

Each cell of a lead-acid battery contains electrodes of elemental lead (Pb) and (PbO₂). Small amounts of antimony, tin, calcium or selenium are usually alloyed in the electrode to add strength and simplify manufacture. The lead electrodes, battery posts and lead oxide are used to manufacturer lead for new grids, parts and lead oxide.

The recovered lead is separated and put through a Reverb Furnace. The furnace recovers a high percentage of the lead and the slag is considered hazardous waste because of the high residual lead content. The slag from the Reverb Furnace is sent to a blast furnace and the lead is extracted. Once the lead has been recovered by the blast furnace, the remaining "slag" is non-hazardous waste and can be safely disposed of in landfills.

3.1.2 Electrolyte

Sulphuric acid is the primary components of the electrolyte within the battery. The dilute sulphuric acid be reused and recycled in a variety of processes:

1. Filtered and used on site: Acid is drained from the used batteries and filtered to remove any particles. This filtered acid is then used in the Waste Water Treatment Facility at the smelter.
2. Crystallized: Acid is put through a Crystallizer and in the process turned into Sodium Sulphate. The Sodium Sulphate is sold to manufacturers of glass, detergents etc.
3. Sold to Third Parties: The drained Acid is sold without any recycling or refining, to third parties. For example to Tanneries.
4. Neutralized: The Acid is neutralized using Caustic Soda into a Non-hazardous waste that can be disposed off safely.
5. New Filter Process – (Experimental): The drained Acid can be filtered using a new process whereby the Acid can be re-used in the manufacture of new batteries.

3.1.3 Casing

The smaller SLA and transport batteries have a plastic casing while the larger industrial and commercial batteries have steel casings.

Both the plastic and steel casings are recovered and recycled into new cases for lead-acid batteries.

4 Stakeholder Consultation

The CBA will undertake consultation for the 2016 version of its Stewardship Program. The consultation will include internal meetings of the BC Advisory Committee, conference calls and direct email notifications to local governments, contractors and recycling organizations using the distribution lists of Coast Waste Management, RCBC, BC Product Stewardship Council and members of the CBA.

In addition, the CBA’s draft Stewardship Plan will be posted on www.canadianbatteryassociation.ca and the CBA will engage in a variety of webinars and if there is sufficient interest, the CBA will hold up to four Provincial meetings in Prince George, Kelowna, Surrey and Victoria.

The consumer will not be directly consulted as the CBA’s Stewardship Program does not require the use of eco-fees and hence consumers are not financially impacted by the Stewardship Program.

5 Performance Measures

The CBA’s programs performance will be measured and reported for BC at www.canadianbatteryassociation.ca. The following sections summarize the different performance measures and the actions used by the CBA to achieve its targets.

5.1 Recovery Rates

The primary performance measure of the CBA’s Stewardship Program is Recovery Rate. All other performance measures influence the Recovery Rate for LABs to varying degrees.

All sales and recovery volumes reported by the CBA have been audited by the accounting firm Green Horwood Co LLP. Copies of our audit reports can be found at www.canadianbatteryassociation.ca.

After 5 years of data collection, the CBA has an accurate and verifiable understanding of LABs sales and recovery volumes in BC.

5.1.1 Lead-Acid Battery Sales

Within BC, the CBA members account for well over 95% of sales of LABs sold in British Columbia – 20,000,000 kg.

The 2014 audited LAB sales in BC (including Interstate Battery Systems) are summarized below.

Battery Category	CBA Sales (kg)
Starting Lighting Ignition (SLI)	17,200,000
Motive	1,250,000
Stationary	1,300,000
	19,750,000

The Starting, Lighting and Ignition (SLI) batteries account for about 86 % of the LABs sales in BC and 85% of the SLI batteries are

distributed by CBA members in the automotive “aftermarket” and the remaining 15% of SLI batteries were sold in a new vehicle.

Motive (eg forklift and golf cart batteries) and Stationary (UPS and energy storage) batteries are also included in the CBA’s stewardship plan and account for about 14% of LABs sold in BC. The Motive and Stationary batteries are primarily sold to commercial operations for use in a variety of industrial applications.

There are imports of batteries into BC that are not included in the above statistics. LABs in products such as heavy equipment, buses, boats, ATVs, motorcycles etc. as well as the direct import of speciality Motive and Stationary batteries from the USA and Asia. The CBA estimates this market to be less than 5% of total sales.

5.3.2 Recovery

The 2014 audited Recovery volumes for the three battery types by CBA members is summarized below:

Battery Category	CBA Recovery (kg)
Starting Lighting Ignition (SLI)	15,900,000
Motive	860,000
Stationary	18,700
	16,778,700

In total, just over 16,775,000kg of LABs were recovered by CBA members in 2014.

LABs recovered in BC are recycled at one of 5 smelters located in Canada or the USA.

- Metalex in Richmond, BC
- Teck Cominco in Trail, BC;
- Tonolli Canada in Mississauga, ON
- Exide’s smelters in the United States;
- RSR Corporation in California.

Using the data from the different smelters, the CBA has determined that the “private” recycling of LABs by non-ferrous recyclers in BC accounted for about 25% of LAB recovery.

The total LAB recovery in BC is 21,725,000 kgs.

5.1.3 Recovery Rate

The Recovery Rate is calculated based on the kilograms of LABs sold vs. the kilograms of LABs recovered for recycling.

$$\text{Recovery Rate} = \frac{\text{Weight of LABs Transported for Recycling}}{\text{Weight of LABs Sent to Smelters}}$$

Battery Category	CBA Recovery Rate (%)
Starting Lighting Ignition (SLI)	92%
Motive	59%
Stationary	1%
	85%

Approximately 25% of LAB recovery rate is by “private” non-ferrous recycling companies outside of the CBA. When the CBA data is combined with the data from the “private” recyclers, the overall Product Recovery Rate for LABs is approaching 109%.

The Product Recovery Rate Targets for the next five years will include information from private recyclers and will exceed the 75% target outlined in the Recycling Regulation.

Year	Product Recovery Rate Targets (%)
2016	95%
2017	95%
2018	95%
2019	95%
2020	95%

No Recovery Rate is set for CBA members because of the significant volume of LABs recovered by private recyclers and the proportion of batteries recovered by the private recyclers is varies depending on commodity value of lead on the London Metal Exchange (LME).

When the LME commodity value for lead increases, the proportion of LAB recovery by private recyclers will increase and when the LME price of lead decreases the proportion of LAB recovery by CBA members will increase because the core value for batteries provides a base value for LABs.

Consequently, the overall Product Recovery Rate for LABs will be close to 100% in BC and will be relatively stable even if the commodity value for lead fluctuates.

5.2 Awareness

Awareness is one of the key factors that influence the Recovery Rate of LABs.

5.2.1 Consumer Awareness Studies

In 2008, Ipos-Reid conducted an awareness survey in BC to gain a baseline consumer awareness survey of the public to industry-led product stewardship programs. The 2008 study found that 62% of the respondents were familiar with the recycling of LABs.

In 2014, the CBA and the other members of the Stewardship Agencies of BC (SABC) contracted with Insights West for a comprehensive Consumer Awareness Study for stewarded products and the results for LABs are summarized below:

Questions to Consumers	Response
Awareness Program Exists to Take Care of LABs	69%
Participation in the Program	51%
Know Where to Get Information About Recycling and Safe Disposal of LABs	68%
Know Location to take Unwanted LABs	54%
Know Where to Get Information about Return Collection Facilities for LABs	65%
Perception Program for LABs is Convenient	75%
Trust Program will Safely Recycle / Dispose of LABs	84%

The results of the 2014 Consumer Awareness study produced similar results to the 2008 and the SABC consumer awareness study provides a benchmark for future studies that will be repeated every two years by the CBA in partnership with the other members of SABC.

There are three important conclusions to draw from the 2014 Consumer Awareness Study:

- 1) Approximately 50% of consumers surveyed have not needed to dispose of LABs in the past confirming the assertion that a high percentage of consumers replace their LABs at a mechanical repair shop by a licensed auto technician;
- 2) 75% and 84% of consumers that were aware of the LAB Stewardship Program thought it was convenient and consumers had a high level of trust that the LABs would be safely recycled;

3) the Consumer Awareness results for LABs were similar to the results for the Used Oil and Tires Stewardship Programs confirming the assertion that for the most part, consumers have their vehicles serviced at a repair shop by a licensed technician.

While it is important to have the general public aware of the Stewardship Program for LABs, the majority of consumers have their vehicles serviced at a licensed vehicle repair facility. Consequently, Consumer Awareness has little to no influence on the overall Recovery Rate for LABs. For these reasons, there is no Performance Target for Consumer Awareness of the LAB Stewardship Program.

5.2.2 Consumer and Commercial Outreach

Over the past five years, the CBA has developed a variety of tools in both written and electronic format that promote the safe collection, transportation and recycling of LABs.

Consumer Outreach

The CBA has developed a variety of websites to provide information to the consumer regarding the management of the Stewardship Program and the Return Collection Facilities for lead-acid batteries.

The primary interface with the consumer is through the Recycling Council of BC. The CBA contributes to the Recycling Hotline; Recyclepedia and Recyclepedia for smart phones to provide a “one-stop shop” consumer outreach program. In 2014, RCBC received approximately 450 calls and 1500 web searches from consumers related to the recycling of LABs.

In addition, the CBA operates two websites to distribute information to the consumer. The websites are:

www.recyclemybattery.ca and www.canadianbatteryassociation.ca.

In 2014, www.recyclemybattery.ca had just over 3500 visits originating in BC.

In addition, the CBA contributes to the promotion of the BCRecycles brand that was developed by the Stewardship Agencies of BC. The goal of the BCRecycles brand is to raise awareness of all Stewardship Programs across BC. This is accomplished through the www.bcrecycles.ca website as well as the BC’s Recycling Handbook.

Finally, the CBA and Call2Recycle have formed a communications partnership to provide better communication on recycling of batteries to consumers. Having one communications message for the recycling of batteries will reduce confusion to the consumer and be more operationally efficient.

Commercial Outreach

The members of the CBA distribute more than 95% of all new aftermarket LABs to commercial operations in BC. This allows the direct marketing of recycling information directly to the IC&I sector that generate used LABs in BC.

In addition to the direct marketing to the IC&I sector by CBA members, the CBA participated in the BCRecycles' Ambassador Tour for the past 2 years. Because the majority of LABs are removed from vehicles by qualified Auto Repair Technicians, the CBA participates in the BC Recycles Ambassador Program that targets the retail and recycler facilities in BC.

In 2015, the BC Recycles Ambassador Program visited 137 Municipalities, 1710 retailers and recyclers and attended 24 public events. The 2014 program achieved over 30 earned media interviews, 17 government interviews and 425,000 media impressions. In total, the 2015 program reached approximately 300,000 citizens with the CBA's message.

Finally, the CBA has prepared technical and recycling information that can be used by its members to educate their staff and their IC&I customers on the safe collection, storage and transportation of LABs to ensure compliance with the Federal Transportation of Dangerous Goods and the Provincial Hazardous Waste regulations. CBA members promote the Stewardship Program as part of sales and service to their commercial customers.

First Nations Outreach

The CBA has partnered with the Automotive Recyclers Environmental Association (AREA) to develop and implement recycling strategies for First Nation communities in BC. The *B.C. First Nations Guide to Recycling Vehicles and Other Stewarded Products* will be published in 2016 and AREA through funding from the CBA, other Stewardship Programs and Indigenous and Northern Affairs Canada.

In addition, AREA will start direct marketing of the stewardship programs to First Nation Communities throughout BC in 2016 after the guidebook is completed.

5.3 Accessibility

Accessibility to the recycling infrastructure for consumers and commercial operations is an important factor to ensure a high Recovery Rate.

The CBA program is based on a reverse-distribution network where the distributors of LABs in BC will deliver new LABs to the retail and commercial locations and pick up the used LABs at the same time. Approximately 85% of all LABs sold in BC are collected in this reverse-distribution network and the system works effectively in urban and rural communities where there are retailers of new LABs.

In addition to the CBA's reverse-distribution network, there are a variety of private non-ferrous recyclers throughout BC that will collect LABs from consumers and commercial operations. Currently, about 25% of all LABs are collected through this private recycling network that is outside the Stewardship Program for LABs.

5.3.1 Urban Communities

There are approximately 180 retail facilities for the consumer to drop off LABs in urban locations. Canadian Tire and Kal Tire are the primary LAB return collection facilities and this is convenient for the public as they can drop off used tires and used oil at these same locations.

In addition, the following CBA members operate 20 warehouses that will receive used motive and stationary LABs. These warehouse locations are located on the CBA website www.recyclemybattery.ca

The Performance Target for urban communities is a return collection facility within 30 minutes of a consumer and the return-to-retail system used by the CBA accomplishes this Target in urban communities.

5.3.2 Rural Communities

One of the key challenges of any stewardship program is the delivery of recycling facilities in rural areas. The majority of rural communities will have some sort of retail outlet for new LABs that

will serve as a collection point for the CBA's reverse-distribution network.

In addition, rural communities have private non-ferrous recyclers that will also collect LABs from the consumer.

The Performance Target for rural communities is a return collection facility within 45 minutes of the consumer. Appendix 2 summarizes the number of return-to-retail locations in the different rural communities in BC. The Appendix identifies rural communities that will need some sort of return collection facility for the public.

5.3.3 Remote Communities and Remote Locations

Remote communities are defined by the CBA as a community where the commodity value of a used LAB is not sufficient to cover the collection and transportation costs associated with recycling.

Remote communities however usually have some sort of mechanical repair facility to repair vehicles and that facility will collect LABs that are then transported to a city or town and sold.

The most common remote community will be First Nations Communities. As such, the CBA has established a partnership with the Automotive Recyclers Environmental Association (AREA) to ensure that LABs in remote First Nations communities are collected, stored and transported in a safe manner to recycling facilities in urban communities – see Section 5.2.

Remote locations are commercial / industrial LAB applications (e.g., Coast Guard lights, Telco relay stations, mines etc) where there is no surrounding community. The remote commercial operations are responsible to recover and return the LAB to an appropriate point within the CBA's reverse distribution network or the private recycling network.

The CBA also does special projects in remote locations. To date, the CBA has helped recycled LABs recovered under a marina on the Sunshine Coast and an iron-ore mine on Baffin Island.

5.4 Generation, Storage and Transportation

Because the storage and transportation of new, used and waste LABs are heavily regulated, the CBA has implemented *The Management of Recyclable Lead-Acid Batteries - Collection, Storage & Transportation in Canada in BC*.

Each of the 20 warehouses operated by a CBA member are included in the program. The program is designed to provide education and information to CBA members so that they are in compliance of all Provincial and Federal laws and they have an appropriate Operational, Contingency and Closure Plans to respond appropriately to spills and emergencies.

5.4.1 Generation, Storage and Transportation

New, used and waste LABs are considered a Dangerous Good under the Federal Transportation of Dangerous Goods Regulation and waste LABs are considered a hazardous waste by the BC Hazardous Waste Regulation.

To ensure compliance to Federal and Provincial regulations, the warehouses will need to be in compliance with the following requirements:

Generation: All facilities that recover waste LABs in BC will need to have a BC Generator Registration Number. The registration threshold for LABs in BC is 2,000 kg in an average 30 day period (approximately 100 vehicle batteries in an average 30 day period).

Storage: All facilities that store over 2,000kg of waste LABs in their warehouse will need to have a BC Generator Registration Number as required by the Hazardous Waste Regulation.

Transportation: In BC, the manifesting of shipments of 1,000 kg of waste LABs within the Province is required by the Hazardous Waste Regulation. Trans-boundary shipments >1,000 kg of waste LABs are manifested as required by the Federal Canadian Environmental Protection Act (CEPA) and the Export and Import of Hazardous Wastes Regulation under CEPA.

Recycling: Facilities that actively recycle LABs will be required to be registered as a Hazardous Waste Facility under BC's Hazardous Waste Regulation.

5.4.2 Training and Education of Employees

The collection, storage and transportation LABs pose a variety of environmental, health and safety hazards and employees involved in the of LABs will have a variety of training and education

requirements. For example, all drivers of new, used or waste LABs must have the Transportation of Dangerous Goods Certificate.

The training and education is the responsibility of the individual CBA member; however, the CBA will help members prepare training and education materials as part of its Environmental Management Program.

5.4.3 Inspection of Recycling Infrastructure

As part of the CBA's ongoing commitment to the Stewardship of LABS, the CBA will visit each CBA member operating a warehouse in BC and ensure compliance to environmental, health and safety regulations.

5.5 Residuals Management

Lead-acid batteries are one of the most recycled products sold today. Waste LABs are needed by battery manufacturers to ensure they have a supply of lead to manufacture a new LAB. This section describes the fate of the used LAB once it has been recovered by a CBA member.

5.5.1 Reuse

Some LABs that are no longer wanted by the customer can be refurbished – especially the industrial batteries.

To maximize the reuse of LABs, the CBA worked with BC Environment's Hazardous Waste group to define a "used" LAB from a "waste" LAB. The new definition provides greater flexibility for CBA members to refurbish used lead-acid batteries rather than declaring lead-acid batteries a "hazardous waste" at the end of the battery's "primary use". Approximately 10 to 15% of LABs can be refurbished and resold as a used battery.

In addition, the CBA has developed a protocol for the refurbishing of the large forklift batteries that have been declared a hazardous waste. The *Protocol for Refurbishing and Delisting "Waste" Lead-Acid Batteries* has been submitted to the BC Ministry of Environment for Approval and a copy of the Protocol is available from the CBA upon request.

5.5.2 Recycling

For used LABs that cannot be refurbished and resold, they are declared a Hazardous Waste at one of the 20 warehouses and the waste LABs are sent to one of five smelters for recycling:

- Metalex in Richmond, BC;
- Tech Cominco in Trail, BC;
- Tonolli Canada in Mississauga, Ontario;
- Exide Technologies' smelter in Indiana;
- RSR Corporation's smelter in California.

All recovered LABs collected by CBA members are sent to recycling and smelting facilities that have valid permits and/or approvals. The recycling requirements and emission levels for recyclers and smelters are set by Provincial or State governments as part of their permit/approval processes for the recycling and smelting facilities.

The smelters break the battery into its different components before it is recycled. Battery Council International provides the following information on how a battery is recycled.

Material	Description	Fate
Metals	99% of lead is recovered during the smelting process	Lead ingots are sold as a Commodity on the open market.
	1% of lead from the smelting process is not recovered and is contained in dross – a waste from the smelting process	Private Landfill
	Antimony and Calcium are used to provide strength within the lead plates	Remain as an alloy of the lead after smelting.
Electrolytes	Sulphuric Acid is recovered and sold as an input to another manufacturing process.	Recycled and sold as a commodity.

Plastics	<p>The Polypropylene Case that provides structure to most batteries.</p> <p>Stationary batteries have a clear casing made of Acrylic.</p> <p>Within each battery, Plastic Separators are used to Isolate the Positive and Negative plates in a cell.</p>	<p>About 70% of the plastic is recycled and used to make new battery casings. Acrylic casings are not recyclable and are burned for energy recovery.</p> <p>The Plastic Separators are burned at the smelters for energy recovery and creating an oxygen free environment during the smelting process.</p>
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5.5.3 Landfill

The objective of the CBA’s Stewardship Program is to divert 100% of the LABs from landfills. To validate this objective, the CBA lead the development of the Waste Characterization Tool to determine the quantity of Stewarded Products (including LABs) in landfills.

In 2014 and 2015, the Stewardship Agencies of BC (SABC) worked with the Sunshine Coast Regional District (SCRD) and Metro Vancouver to conduct two landfill waste characterization studies. Both studies focused on the occurrence of LABs and other stewarded products in the Municipal and IC&I waste streams.

The study in Gibsons and Sechelt focused on the household waste stream and no LABs were recovered in that study. The study in with Metro Vancouver was more comprehensive and focused on the Municipal and IC&I waste streams. Like the household study on the Sunshine Coast, no LABs were recovered in the household waste stream in Metro Vancouver; however, a single LAB weighing 6kg was recovered in the IC&I Metro Vancouver waste stream.

The recovered LAB from the IC&I stream was a Sealed LAB that would have been used to provide ignition or back up power to a product. The battery would have been imbedded in a product that was manufactured in Asia and sold into BC. The battery was not part of the CBA’s Stewardship Program and was not sold in compliance with the Recycling Regulation.

The results of the Metro Vancouver study indicate that small sealed LABs may be present in the IC&I waste stream and that LABs that were purchased outside of the CBA's Stewardship Program will be more likely to be present in the IC&I waste stream because these products do not have a reverse-logistics recycling program operated by CBA members.

6 Program Management

6.1 Program Efficiency

In addition to the CBA's the reverse distribution recycling system established by its members to recover LABs in urban and rural communities, the CBA has partnered with other Stewardship Agencies to improve operational and program efficiency.

There are three notable partnerships that have helped the CBA reduce costs and increase efficiency:

6.1.1 Stewardship Agencies of BC

The CBA is an active participant in the collaborative group called the Stewardship Agencies of BC (SABC). SABC brings together the different Stewardship Agencies in a forum to work on issues that are common to all Stewardship Programs.

In 2013, SABC published an Action Plan that is available at <http://www.bcrecycles.ca/about-stewardship-our-action-plan/>. The Action Plan summarizes the results of 4 Working Groups that focused on:

- Program Performance
- Collection and Operational Excellence;
- Education and Awareness;
- Local Government Relations

Currently SABC is starting a project with the Ministry of Environment to improve Performance Measures for Stewardship Programs.

6.1.2 Call2Recycle

Call2Recycle and the Canadian Battery Association both have National Stewardship Programs for batteries. The CBA focuses on lead-acid batteries and Call2Recycle focuses on single use and small rechargeable batteries.

In the fall of 2015, Call2Recycle and the CBA entered into a Memorandum of Understanding to focus on areas of common interest. The MoU focuses on three areas:

- 1) Common messaging to the consumer.
- 2) Reverse Logistics Recycling Infrastructure.
- 3) Leverage Program Expertise.

See Section 7.1 for more details how the MoU will be implemented out.

6.1.3 Automotive Recyclers Environmental Association

In British Columbia, the Automotive Recyclers Environmental Association (AREA) has developed an end-of-life vehicle recycling program for remote and First Nation communities.

The CBA has partnered with AREA to include LABs in the recycling strategies for First Nation communities – especially remote First Nation communities.

See Section 7.2 for more details on how the partnership with AREA will be implemented.

6.2 Quality of Service

To track customer satisfaction, the CBA has integrated into the consumer awareness program an estimate of community and partner satisfaction, number and nature of complaints, number and nature of service disruptions.

To date, there have not been any complaints about the CBA's Stewardship Program.

The Quality of Service results in the Consumer Awareness studies will be reported in the CBA's Annual Report to the Ministry of Environment.

6.3 Management Performance

To ensure the CBA is accountable to Regulators, members and stakeholders, the CBA will be subject to a variety of audits and reports.

6.3.1 Financial Audit

The CBA undergoes an annual Financial Audit by James A. Boyko. Mr Boyko is a Chartered Accountant in Toronto and has prepared the CBA's Auditor's Report since FY 2011.

The CBA's Audit Report is presented to CBA Members at their Annual General Meeting and the Audit Report is available upon request.

6.3.2 Non-Financial Audit

The CBA has undergone a non-financial audit by Green Horwood & Co LLP in Victoria since 2013.

The purpose of the non-financial audit is to verify the key elements of the CBA's Annual Stewardship Program Report. The key elements include auditing of:

- Number of Return-Collection Facilities operated by the CBA;
- Recovery Rates by CBA members;
- Fate of recovered LABs.

The CBA's Non-Financial Audits are posted on the CBA's website www.canadianbatteryassociation.ca

6.3.3 Reporting

The CBA will publish on its website:

- The Stewardship Plan for British Columbia;
- Annual reports to the Ministry of Environment;
- Results of its stakeholder consultations;
- Priorities, goals and targets set by the Board of Directors;
- News and events.

The CBA's Annual Report to the Ministry of Environment will include:

- a description of the CBA's educational materials and strategies used in the previous calendar year and changes proposed for the current calendar year;
- the location of the CBA's return collection facilities in urban and rural areas and any changes in the number and location of collection facilities from the previous report and proposed changes in the current calendar year;
- the number of activities and events to recover LABs from remote communities and locations and proposed activities and events for the current calendar year;
- efforts taken by the CBA to reduce environmental impacts throughout the product life cycle and to increase reusability or recyclability of LABs at the end of the product's cycle;
- a description of how the recovered product was managed in accordance with the pollution prevention hierarchy and proposed projects to improve operational efficiency;

- the total amount of the product sold and collected by the CBA members will be used to determine the CBA's Collection rate. In addition, the CBA will work with the other Stewardship Program to prepare sales and collection rates for the industry as a whole;
- a comparison of the approved plan's performance for the year with the performance requirements and targets in the Recycling Regulation and the CBA's approved plan.

7 Priorities for Next 5 Years

The CBA has accomplished several goals in the first five years of its Stewardship Program in BC. Notably, the CBA has:

- established a verifiable reporting system that reports sales, recovery and end-fate of the LABs collected in BC;
- established a comprehensive network of Return Collection Facilities that provide easy access for consumers in urban and rural communities;
- reduced the level of retail non-compliance to levels estimated to be below 5% of LAB sales;
- brought the battery industry together to establish a National Stewardship Program that represents the majority of LAB manufacturers and distributors and a significant proportion of battery recyclers and smelters;
- become an active participant in the Stewardship Agencies of BC and helped develop meaningful initiatives such as Consumer Awareness Surveys and Waste Characterization Studies.

The CBA plans to build on the progress in the first 5 years and the CBA's Board of Directors have set a number of Program priorities for the next five years.

7.1 Partnership with Call2Recycle

Call2Recycle and the Canadian Battery Association both have National Stewardship Programs for batteries. The CBA focuses on lead-acid batteries and Call2Recycle focuses on single use and small rechargeable batteries.

In the fall of 2015, Call2Recycle and the CBA entered into a Memorandum of Understanding to focus on areas of common interest. The MoU focuses on three areas:

- 1) Common messaging to the consumer. The average consumer wants a common communication message on how to recycle batteries. While different batteries require different collection systems and recycling solutions, the consumer needs a single and focused message that batteries are easy to be recycled and that batteries should not be landfilled.

2) Reverse-Distribution Recycling Infrastructure. The members of the CBA have a coast-to-coast-to-coast distribution network for new, used and waste LABs. While there are some Transportation of Dangerous Goods issues to be resolved, there is the potential for both programs to share the transportation costs from the distribution warehouses to the smelters.

3) Leverage Program Expertise. Both Stewardship Programs have expertise that can be shared. Call2Recycle has expertise in consumer outreach and the CBA members have expertise in IC&I outreach. This expertise combined with a common communication message will be beneficial to both the consumer and commercial customers.

7.2 Rural Communities

The CBA has completed an analysis of the gaps in the Return Collection Facilities for rural communities – see Appendix 2.

The goal of the CBA is to have some sort of LAB collection option in the majority of rural communities by the end of 2017. The highlighted rural communities in Appendix 2 are a priority for the CBA.

In addition, the merger of the Interstate Battery Systems recycling network and the CBA's recycling network will help fill gaps in rural recycling network for LABs.

7.3 Remote and First Nation Communities

The Automotive Recyclers Environmental Association (AREA) has developed an end-of-life vehicle recycling program for remote and First Nation communities.

The CBA has partnered with AREA to include LABs in the recycling strategies for rural and remote First Nation communities.

The initiative for First Nation communities is supported by the Federal Department of Indigenous and Northern Affairs Canada, AREA, the CBA and several of the other Stewardship Programs.

AREA's initiative on First Nations communities started two years ago with site visits to rural and remote communities to assess the need for recycling programs for Stewarded Products and the development of an Information Management System of recycling infrastructure near the communities – see <http://recyclemyvehicle.ca/index.php>

In 2015, AREA began the development of *B.C. First Nations Guide to Recycling Vehicles and Other Stewarded Products*. The Guidebook will assist First Nation communities develop recycling strategies for their communities.

In 2016, AREA will be hiring a part-time First Nations Coordinator to develop and initiate recycling programs on rural and remote First Nation communities for end-of-life vehicles and Stewarded Products. The First Nations Coordinator will work with the Chief, Council and Band Administrators to initiate recycling programs for each of the Stewarded Products included in the program – including LABs.

The objective for the First Nations Coordinator is to be:

- the central point of contact for each First Nation community;
- represent each of the Stewarded Products in the recycling program developed by AREA; and,
- assist First Nation communities apply for grants from INAC to create community recycling strategies for Stewarded Products.

7.4 Health and Safety

In 2016, WorksSafeBC is setting tighter regulations on lead exposure for workers that may be exposed to lead dust. The CBA will prepare programs and materials for CBA members to comply with the new WorkSafeBC regulations.

This initiative will be integrated into the CBA’s Environmental Management Program for CBA members.

7.5 Improved Data Verification of Private Recycling Network

Currently, the private recycling network accounts for approximately 25% of all LABs recovered in BC and the smelters process virtually 100% of all LABs recovered. But because the recyclers and smelters are not considered “Brandowners” under the Recycling Regulation, they are not obligated to report their recovery data and information to the CBA.

The goal of the CBA is to develop an overall Recovery Rate for LABs and the CBA has had some success working with the non-ferrous recyclers and smelters of LABs to support and share their recovery data in a confidential format.

The CBA will continue to work with recyclers and smelters in Canada to develop a comprehensive understanding of the fate of all LABs collected in BC and generate an accurate Product Recovery Rate.

Appendix 1: Consultation Summary for Canadian Battery Association

Draft

100 Mile House	1,941	1	Armstrong	4,533	
Quesnel	9,710	2	Coldstream	10,388	
Wells	257		Enderby	2,906	1
Williams Lake	11,090	2	Lumby	1,804	1
Unincorporated Areas	42,049		Spallumcheen	5,128	
Central Coast	3,118		Vernon	38,968	4
			Unincorporated Areas	19,452	
Central Kootenay	59,756		Northern Rockies	6,003	
Castlegar	7,871	2	Fort Nelson	na	1
Creston	5,246	1	Northern Rockies Regional Mun.	5,558	
Kaslo	1,184		Unincorporated Areas	445	
Nakusp	1,530	1	Okanagan-Similkameen	83,337	
Nelson	9,938	1	Keremeos	1,479	
New Denver	516		Oliver	4,783	1
Salmo	1,060		Osoyoos	5,189	
Silverton	202		Penticton	33,250	2
Slocan	391		Princeton	2,757	1
Unincorporated Areas	31,818		Summerland	11,243	
Central Okanagan	184,411		Unincorporated Areas	24,636	
Kelowna	120,812	8	Peace River	62,244	
Lake Country	11,409		Chetwynd	2,676	1
Peachland	5,244		Dawson Creek	11,514	2
West Kelowna	27,303	3	Fort St. John	19,457	2
Unincorporated Areas	19,643		Hudson's Hope	1,051	
Columbia-Shuswap	53,713		Pouce Coupe	746	
Golden	3,959	1	Taylor	1,480	
Revelstoke	7,267		Tumbler Ridge	2,450	
Salmon Arm	17,220	2	Unincorporated Areas	22,870	
Sicamous	2,950		Powell River	20,207	
Unincorporated Areas	22,317		Powell River	13,338	2
Comox Valley	64,084		Sechelt Ind Gov Dist (Part)	18	
Comox	13,444		Unincorporated Areas	6,851	
Courtenay	24,216	2	Skeena-Queen Charlotte	19,438	
Cumberland	3,163		Masset	929	
Unincorporated Areas	23,261		Port Clements	453	
Cowichan Valley	81,689		Port Edward	570	
Duncan	5,008	2	Prince Rupert	12,846	1
Ladysmith	8,118		Village of Queen Charlotte	961	
Lake Cowichan	3,182		Unincorporated Areas	3,679	
North Cowichan	29,493		Squamish-Lillooet	39,209	
Unincorporated Areas	35,888				
East Kootenay	59,954				

Canal Flats	817		Lillooet	2,367	1
Cranbrook	19,161	2	Pemberton	2,416	
Elkford	2,591		Squamish	17,181	2
Fernie	4,415	1	Whistler	10,228	
Invermere	3,668	1	Unincorporated Areas	7,017	
Kimberley	6,705		Strathcona	44,189	
Radium Hot Springs	1,005		Campbell River	31,328	2
Sparwood	3,804	1	Gold River	1,425	
Unincorporated Areas	17,788	1	Sayward	331	
Fraser Valley	280,210		Tahsis	381	
Abbotsford	135,866	4	Zeballos	161	
Chilliwack	76,106	3	Unincorporated Areas	10,563	
Harrison Hot Springs	1,594		Sunshine Coast	29,551	
Hope	6,269		Gibsons	4,448	
Kent	5,515		Sechelt	9,164	2
Mission	37,167	1	Sechelt Ind Gov Dist (Part)	831	
Unincorporated Areas	17,693	1	Unincorporated Areas	15,108	
Fraser-Fort George	95,652		Thompson-Nicola	131,675	
Mackenzie	3,827	1	Ashcroft	1,740	
McBride	674		Barriere	1,722	
Prince George	74,547	5	Cache Creek	1,083	1
Valemount	1,044		Chase	2,478	
Unincorporated Areas	15,560		Clearwater	2,348	1
Metro Vancouver	2,318,526		Clinton	597	
Anmore	2,160		Kamloops	87,017	7
Belcarra	681		Logan Lake	2,189	
Bowen Island	3,608		Lytton	226	
Burnaby	222,802	7	Merritt	7,450	2
Coquitlam	123,213	4	Unincorporated Areas	24,825	
Delta	99,862	2			
Langley, Township of	103,267	8			
Langley	25,526	1			
Lions Bay	1,398				
Maple Ridge	75,051	2			
New Westminster	65,016	1			
North Vancouver	48,881	4			
North Vancouver	86,725				
Pitt Meadows	17,915				
Port Coquitlam	56,446	1			
Port Moody	32,998				
Richmond	193,255	7			
Surrey	446,561	9			
Vancouver	628,621	7			
West Vancouver	43,307				
White Rock	19,102	1			
Unincorporated Areas	22,131	1			