

November 2017

Biennial / 5 Year Progress Report

Integrated Solid Waste and Resource Management Plan



Preface

For Metro Vancouver's Integrated Solid Waste and Resource Management Plan, this report serves as both:

- its 2017 biennial progress report, and
- its Five-Year progress report

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I. SUMMARY

The following section is a high level summary of

(a) The key activities within each of the main strategies in the ISWRMP

(b) The main performance measures in the ISWRMP

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(a) Summary of ISWRMP Strategies

General

Strategy 1.1 Advocate that senior governments transfer additional waste management responsibilities to producers and consumers

Metro Vancouver, in collaboration with the Federation of Canadian Municipalities, formed the National Zero Waste Council in 2013. The Council calls for national action and systemic change to address waste generation – focusing upstream on waste prevention and reduction. The Council accomplishes much of its work through working groups on specific issues. Current working groups include: National Communications Campaigns, Product Design and Packaging, Food, the Circular Economy, and a newly-formed Construction & Demolition working group. The Food Working Group has developed a National Food Waste Reduction Strategy which includes a tax incentive for food donation.

In 2016, Metro Vancouver collaborated with the Ministry of Environment to update its 2014 study “Assessment of Economic and Environmental Impacts of Extended Producer Responsibility Programs in BC”. The update included Packaging and Printed Paper, and Electrical and Electronic Devices.

In 2017, Metro Vancouver commissioned a study of the economic and environmental impacts of mattress recycling. This study will inform the Province in its consideration of EPR for mattresses.

Strategy 1.2 Reduce or eliminate materials entering the solid waste system which hinder or limit the opportunities to achieve reuse, recycling, or energy recovery, or that may exacerbate environmental impacts of disposed residuals

In the last two years, Metro Vancouver has worked to implement its disposal bans on organics and clean wood, with behavior change campaigns, ban enforcement, and educational materials. Both bans have shown measurable success in increasing waste diversion. For example, the organics disposal ban increased diversion by 60,000 tonnes in its first year alone.

Research and stakeholder engagement is currently underway to assess the viability of, or alternatives to, additional disposal bans on expanded polystyrene, and textiles.

Strategy 1.3 Provide information and education on options to reduce waste

Recent activities include:

- Launch of Metro Vancouver’s Love Food Hate Waste online program, modelled after the successful UK version, to help households prevent food waste by planning, storing and using their food more effectively

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- Development of a multi-family recycling toolkit for property managers
- Continued advertising and social media campaigns for Christmas “Create Memories not Garbage”, and Organics “Food isn’t Garbage”.
- Case studies, resource guides and direct engagement with businesses on the organics disposal ban
- Continued support for the National Zero Waste Council and its various working groups, such as the Food Working Group and its National Food Waste Reduction Strategy

Strategy 2.1 Increase the opportunities for reuse

Recent activities include:

- Funding commitment from Metro Vancouver in support of the National Industrial Symbiosis Program to establish waste exchange programs
- Partnership with UBC for a Sustainable Region Scholars program to develop recycling and reuse projects
- Formation of the BC Solid Waste Research Collaborative to stimulate applied research projects into the 3Rs

Strategy 2.2 Increase the effectiveness of existing recycling programs

Recent activities include:

- Continued outreach in support of all regional disposal bans, including guides, case studies, presentations, social media, K-12 programs, and online platforms
- Increased number of inspectors to enforce regional disposal bans
- Working group with stakeholders to improve the effectiveness of disposal bans
- Ongoing work with RecycleBC (formerly Multi-Materials BC) and others to test recycling systems for public spaces
- Continued tracking and evaluation of regional waste flows and recycling activities
- Provision of dedicated recycling services at current and future Metro Vancouver Transfer Station and Small Vehicle Drop Off facilities, if requested by municipalities

Strategy 2.3 Provide opportunities to increase private sector recycling

Recent activities include:

- Continued annual revision of the Greater Vancouver Sewerage and Drainage District Tipping Fee and Solid Waste Disposal Regulation Bylaw.
- Increases in EPR program responsibilities (most notably Packaging and Printed Papers) that reduce the influence and responsibility of local governments

Strategy 2.4 Target demolition, land clearing and construction (DLC) sector for increased reuse and recycling

Key recent activities under this strategy include:

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- Providing technical assistance to municipalities that introduced demolition recycling requirements, based on a sample municipal bylaw previously developed by Metro Vancouver
- Adding designated spaces at regional transfer stations for drop-off of clean wood for recycling
- An upcoming feasibility assessment for increased processing capacity for construction and demolition waste in the region.
- Review of current management practices in the residential C&D industry to identify opportunities to minimize contamination of recyclable material and illegal dumping of hazardous C&D material.
- A regional ban on the disposal of clean wood.

Strategy 2.5 Reduce paper and paperboard being disposed

Recent activities include:

- Coordination with RecycleBC (formerly MMBC) as they implemented BC's new Extended Producer Responsibility (EPR) program for Packaging and Printed Papers (PPP). This program has largely removed papers from the jurisdiction of local governments.
- Ongoing community-based social marketing, and regional and municipal public education for waste reduction and recycling of papers and other materials

Strategy 2.6 Target organics for recycling and energy recovery

Recent activities include:

- Continued support for the new Organics Disposal Ban through targeted online, telephone, and printed materials, which include the 'Food Isn't Garbage' campaign, and the 'Love Food Hate Waste' web-based campaign and direct collaboration with Member Municipalities.
- A Multi-Family Residential Organics workshop

Strategy 2.7 Target wood for reuse, recycle, and energy recovery

Recent activities include:

- Increased enforcement of the regional disposal ban on Clean Wood, including a 2017 reduction in the allowable threshold.
- Upcoming research into the feasibility of increased processing capacity for construction and demolition wastes.

Strategy 2.8 Target plastic for increased recycling

Recent activities include:

- Coordination with RecycleBC (formerly MMBC) as they implemented BC's new Extended Producer Responsibility (EPR) program for Packaging and Printed Papers

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(PPP). This program has largely removed plastic packaging from the jurisdiction of local governments.

- Ongoing community-based social marketing, and regional and municipal public education for waste reduction and recycling of plastics and other materials

Strategy 2.9 Target multi-family and industrial, commercial and institutional (ICI) sectors to improve diversion rates

Recent activities include:

- Continuing to coordinate member municipalities' input and participation in implementing EPR for PPP as it expands to the Multi-Family Residential, and eventually Industrial, Commercial and Institutional (ICI) sectors.
- Working to improve multifamily and ICI waste diversion with industry, academics, NGOs and other stakeholders on various working groups, and a waste research collaborative.

Strategy 2.10 Develop contingency plans for the loss of recycling markets

Recent activities include:

- Ongoing monitoring of regional recycling activities and flows, and research into new and alternative markets for key recycled materials.

Strategy 2.11 Integrated Utility Management Advisory Committee

In 2015, Metro Vancouver obtained Ministry approval to separate the monitoring of the solid and liquid waste utilities' respective regional Plans. The GVS&DD's Zero Waste Committee publicly reviews the implementation of the ISWRMP.

Strategy 3.1 Use waste-to-energy to provide electricity and district heating

Recent activities include:

- Continuing investigation of district energy opportunities for the existing facility.
- New upgrades and agreements for power production
- Discontinuation of the procurement process for new Waste-to-Energy capacity
- Approval of a new metal recovery project to be completed in early 2018, which will increase recovery of ferrous metals, and add recovery of non-ferrous metals

Strategy 3.2 Recover energy from other solid waste management facilities

Recent activities include:

- Continued landfill gas utilization at Vancouver Landfill
- Landfill gas utilization at Cache Creek Landfill.

Strategy 3.3 Utilize non-recyclable material as fuel

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Recent activities include:

- Biosolid management pilots underway at Waste-to-Energy Facility.

Strategy 4.1 Utilize the Vancouver Landfill as a disposal site

Recent activities include:

- Continued optimization of waste flows in coordination with other regional disposal facilities.

Strategy 4.2 Ensure a disposal site is available for DLC waste

Recent activities include:

- Ongoing monitoring of regional flows of waste and recyclable materials, and regional disposal capacities
- An upcoming feasibility assessment for a new regional material recovery facility for construction and demolition waste

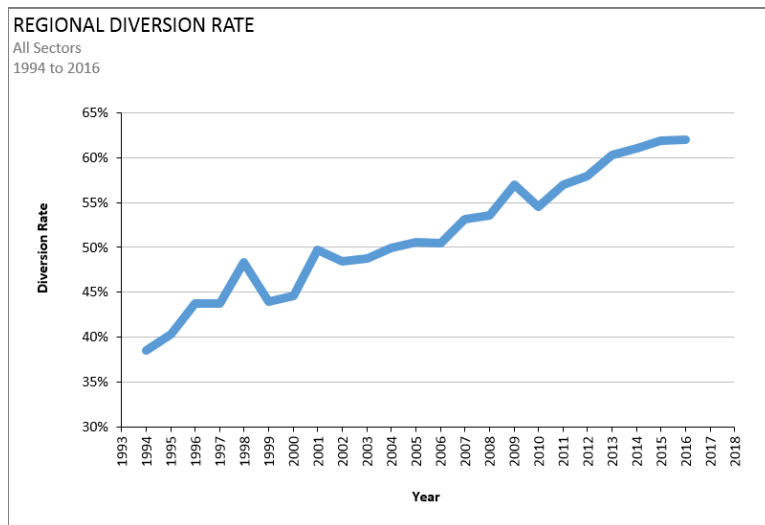
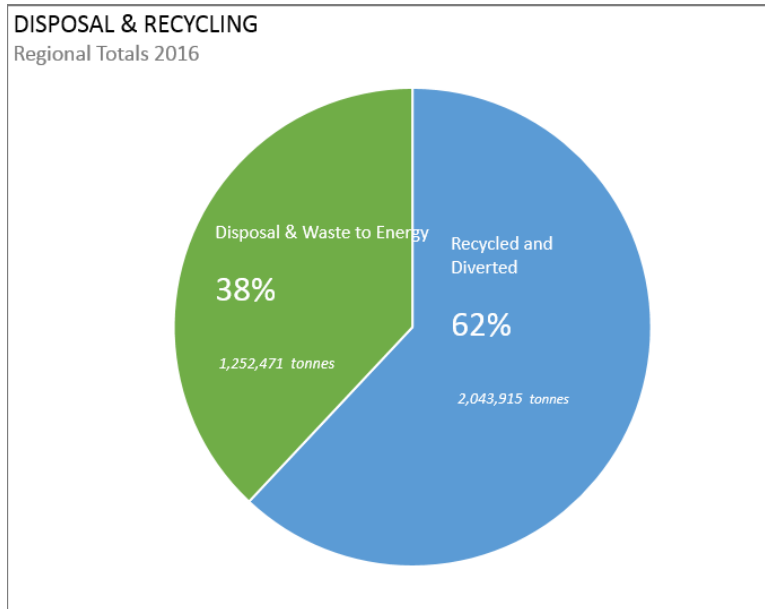
Strategy 4.3 Establish contingency disposal sites

Key recent activities under this strategy include:

- Ongoing monitoring of regional flows of waste and recyclable materials, and regional municipal waste disposal capacity.
- For the interim, contracted for contingency disposal through competitive procurement. Procurement for a three-year contract is underway.

Summary of ISWRMP Performance Measures

For calendar 2016¹, overall waste diversion in the region held steady at 62%, its historically highest level.

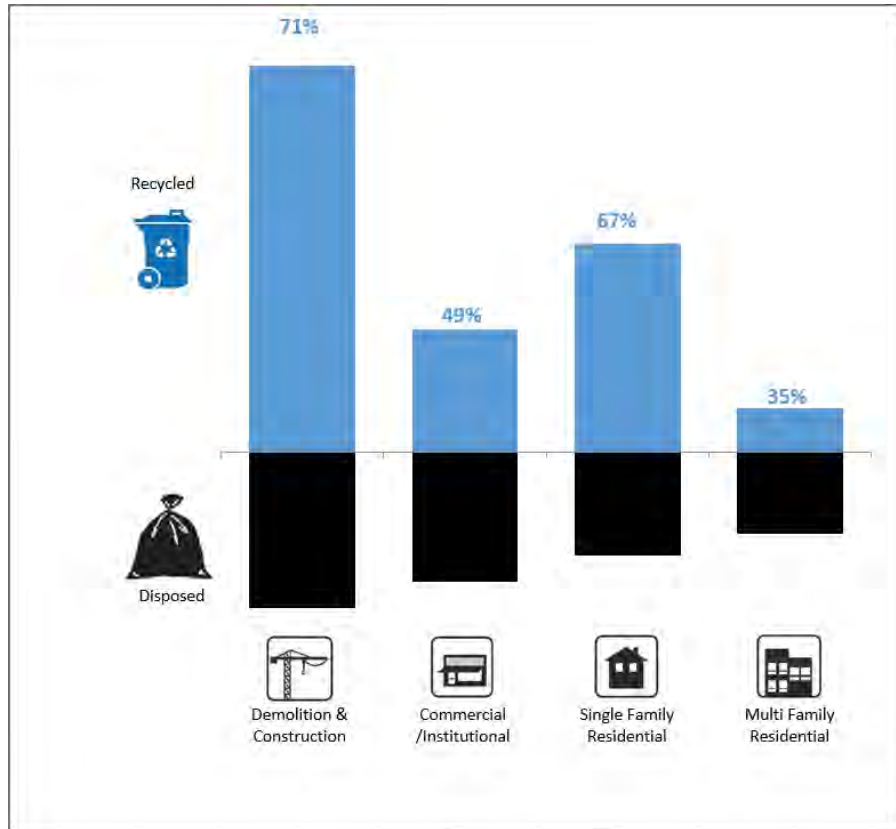


These figures take into account the best estimates of tonnages of waste disposed outside of the regional waste system.

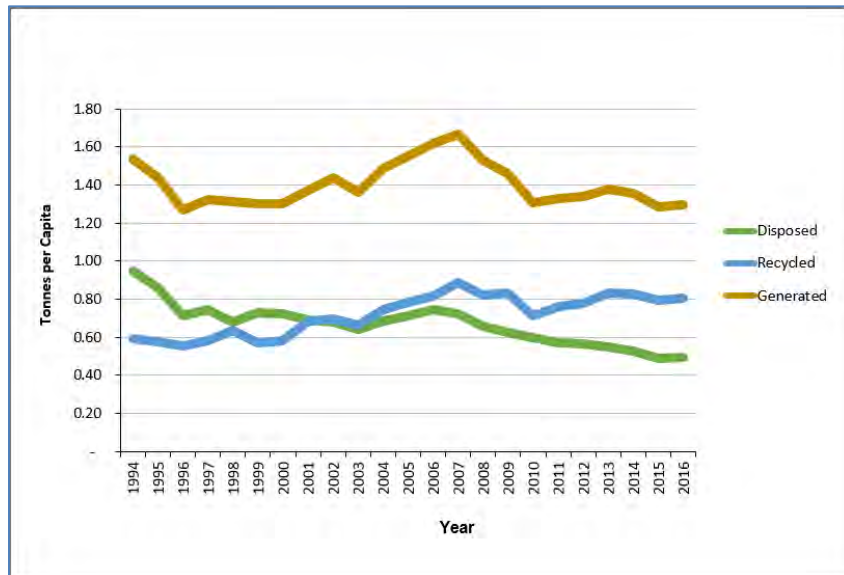
The 2016 waste diversion by individual sectors is illustrated below:

¹ At the time of writing, calendar 2016 was the most recent year for which finalized data was available.

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The following chart illustrates historical progress in per capita waste generation, recycling and disposal:



With respect to the region's waste reduction and recycling goals:

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- The amount of waste generated per capita fluctuates significantly, but overall has declined over the long term. From its high of 1.6 tonnes per capita in 2007, it has dropped to 1.37 tonnes per capita in 2016
- Over the period from 2010 to 2016, the overall diversion (recycling) rate increased from 55% to 62%.
- During the same period, the region reduced its per capita disposal rate from 0.55 tonnes in 2013 to 0.49 tonnes per capita per year in 2016. This takes into account all MSW, including DLC and estimated waste disposed outside of the regional system.

The following table outlines the amount of construction and demolition waste disposed to the Vancouver landfill and to private C&D landfills since 2010:

C&D Waste Disposal by Facility (Tonnes)

Year	Vancouver Landfill	Private Facilities	Total
2010	140,734	165,331	306,065
2011	196,498	169,961	366,459
2012	185,317	173,374	358,691
2013	159,303	233,039	392,342
2014	132,721	260,951	393,672
2015	124,044	266,338	390,382
2016	118,168	232,908	351,076

The following table outlines the amount of residential and commercial waste disposed to regional disposal sites, and outside of the regional system since 2010:

Residential & Commercial Waste Disposal by Facility (Tonnes)

Year	Cache Creek Landfill	Vancouver Landfill	Waste to Energy	Out of Region (Estimated)
2010	396,384	427,083	284,458	
2011	280,249	456,229	281,139	
2012	242,902	469,273	281,260	50,000
2013	217,072	395,253	280,138	60,000
2014	207,191	355,594	275,260	100,000
2015	206,198	366,123	256,402	30,000
2016	134,866	518,324	254,256	

The following table outlines the amount of wastes of different types (municipal solid wastes, construction & demolition wastes, wastewater treatment plant residuals, water treatment residuals, bottom ash from the waste-to-energy facility, and industrial waste (e.g. pulp and paper wastes) from Norampac disposed at the Vancouver landfill since 2010:

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Vancouver Landfill Waste Tonnages (tonnes)

Year	MSW	C&D	WWTP Residuals	WT Residuals	Bottom Ash	Norampac	Total
2010	427,083	140,734	6,545	6,037	46,410		580,399
2011	456,229	196,498	5,775	6,542	46,027		665,044
2012	469,273	185,317	6,050	7,295	44,925	48,347	716,282
2013	395,253	159,303	7,346	6,731	32,538		601,171
2014	355,594	132,721	7,377	7,595	44,861	599	548,747
2015	366,123	124,044	7,312	9,280	43,413		550,172
2016	518,324	118,168	8,028	3,944	43,068		691,532

The following table outlines the amount of fly ash disposed from the waste-to-energy facility since 2010:

Fly Ash Disposal (Out of Region) (tonnes)

2010	12,265*
2011	11,964*
2012	11,841**
2013	11,710
2014	10,720
2015	9,657
2016	10,268

* Cache Creek Landfill

** 8,923 to Cache Creek, 2,918 to Alberta

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The following section is a complete listing of all actions in the ISWRMP, with the current status of implementation for each action.

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Strategy 1.1: Advocate that senior governments transfer additional waste management responsibilities to producers and consumers	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>1.1.1 MV Will: Advocate that senior governments progressively move towards the prohibition of the manufacture and distribution of non-essential, non-recyclable materials and products.</p> <p>1.1.2 MV Will: Advocate that senior governments prohibit the manufacture and distribution of non-recyclable packaging.</p>	<p>The National Zero Waste Council was launched in 2013, and its membership has grown over this period. Preparations for this advocacy work reside primarily within the four working groups focused on: National Communications Campaigns, Product and Packaging Design, Food, and the Circular Economy. For example, the Food Working Group has been advocating for tax incentives to be created to encourage producers to donate their products to food banks.</p>
<p>1.1.3 MV Will: Strongly advocate for EPR programs to reduce waste disposal through implementation of design-for-environment principles, and best management practices that focus on waste reduction, reuse, and recycling. Offer staffing support for and partnership with Ministry of Environment to help accelerate EPR.</p>	<p>In 2016, the study titled “Assessment of Economic and Environmental Impacts of Extended Producer Responsibility Programs in BC” was revised and expanded to include programs for Packaging and Printed Paper and Electrical and Electronic Devices (Phase V). Once posted on both the Ministry of Environment and Metro Vancouver websites, the results of the study will contribute to the Ministry of Environment’s continuous improvement efforts.</p> <p>In 2017, Metro Vancouver commissioned a study to assess the economic and environmental impacts of mattress recycling. The results of the study will be communicated to the Ministry of Environment to help demonstrate the benefits of including mattresses in the Recycling Regulation.</p>
<p>1.1.4 MV Will: Work with other municipalities and regions across BC, Canada, and internationally, to advocate for more development by senior governments in encouraging and developing incentives, including regulation, that promote design of products with an emphasis on reuse and recycling (cradle-to-cradle design).</p>	<p>This action is primarily covered under 1.1.1 which is Metro Vancouver’s support for and participation in the National Zero Waste Council. See also actions 1.1.2 and 1.3.3. In particular, this is carried out by the Council’s product and packaging design working group: http://www.nzwc.ca/focus/design/Pages/default.aspx</p>
<p>1.1.5 MV Will: Participate on federal EPR initiatives such as the Canadian Council of Ministers of Environment (CCME) Extended Producer Responsibility Task Force, to develop national guidelines for sustainable packaging.</p>	<p>In the CCME report “Progress Report on the Canada-wide Action Plan on EPR”, CCME scaled back performance expectations for the Action Plan. Ongoing participation in the CCME Waste Management Task Group is through Ministry of Environment staff who are the official participants in these processes. Metro Vancouver contributes to these processes under 1.1.3, which is the joint EPR work with the Ministry of Environment.</p>
<p>1.1.6 MV Will: Participate on industry stewardship advisory committees.</p>	<p>Metro Vancouver participates on several advisory groups, including: Electronic Products Recycling Association, Major Appliance Recycling Roundtable, Multi-Material BC (now RecycleBC), and Tire Stewardship BC.</p>

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<p>1.1.7 MV Will: Participate on the BC Product Stewardship Council to assist in evaluating existing and developing new EPR programs.</p>	<p>Metro Vancouver is participating as interim co-chair of the BC Product Stewardship Council and continues to participate in regular meetings.</p>
<p>1.1.8 MV Will: Waste projections will consider future trends in population, generation, and management, including EPR.</p>	<p>Solid waste generation and disposal forecasts are continuously improved and updated based on the solid waste system’s most current information. Work on the solid waste projection model is ongoing and continues to help the region to proactively address future solid waste management opportunities and challenges.</p>
<p>1.1.9 Municipalities Will: Partner with Metro Vancouver in support of actions 1.1.1 through 1.1.8</p>	<p>This action is ongoing and consists of collaborating on EPR actions 1.1.1 through 1.1.8 with member municipalities through the REAC Solid Waste Sub-committee. A significant point of emphasis is the RecycleBC (formerly MMBC) program for residential packaging and printed paper, with preparations underway to participate in consultations for RecycleBC (formerly MMBC)’s Three-Year Review.</p>
<p>1.1.10 Other Governments & Agencies Will: Ministry of Environment to accelerate EPR program development and implementation.</p> <p>1.1.11 Other Governments & Agencies Will: Include Metro Vancouver and its member municipalities in the negotiations with producers regarding future EPR programs to ensure that appropriate consideration is given to the existing convenient curbside collection systems.</p>	<p>These actions are ongoing and a collaborative effort between Metro Vancouver, member municipalities and the Ministry in support of EPR actions 1.1.1 through 1.1.5. In 2017, the Memorandum of Understanding on EPR will undergo its Five-Year Review.</p>
<p>1.1.12 Other Governments & Agencies Will: Ensure that the waste recovered under EPR programs will be properly managed in the region and that such materials will not be exported without adequate knowledge of and control over its eventual disposition.</p>	<p>This is a fundamental principle included in all discussions and negotiations with industry, member municipalities and the Ministry of Environment in EPR actions 1.1.1 through 1.1.11</p>

<p>Strategy 1.2: Reduce or eliminate materials entering the solid waste system which hinder or limit the opportunities to achieve reuse, recycling, or energy recovery, or that may exacerbate environmental impacts of disposed residuals</p>	
<p>ISWRMP Strategy and Actions</p>	<p>Current Status of Key Strategies and Actions in the ISWRMP</p>
<p>1.2.1 MV Will: Work with facility operators, local municipalities and the recycling industry to introduce material bans after alternatives are identified and suitable public information programs.</p>	<p>Public Outreach and Information Programs are primarily covered by the actions in strategy 1.3 to develop and deliver a community-based social marketing program.</p> <p>Metro Vancouver conducted extensive engagement and consultation with stakeholders including large organics waste producers (grocers, restaurants, hotels and their associations, schools, property managers, health facilities and small-to-medium enterprises) from 2012 through 2014. This provided input that was taken into consideration in the development of what is, to date, the largest Organics Disposal Ban in the country.</p> <p>A smaller, but similar stakeholder engagement process (including workshops with industry and surveys at Metro Vancouver disposal sites) was carried out for a ban on the disposal of clean wood during 2014.</p> <p>The Organics Disposal Ban, and the Clean Wood Disposal Ban were officially launched on January 1, 2015 with 6 months educational period. Both bans have shown measurable success in increasing waste diversion, particular the Organics disposal ban, which saw an increase of 60,000 tonnes in its first year alone.</p> <p>Research and stakeholder engagement is currently underway to assess the viability of, or alternatives to, additional disposal bans on expanded polystyrene, and textiles.</p>

Strategy 1.3: Provide information and education on options to reduce waste	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>1.3.1 MV Will: Develop and deliver a community- based social marketing program to inform and educate citizens on waste education opportunities including schools.</p> <p>(a) Target a minimum of 70% diversion goal by 2015 over all sectors and an aspirational goal of 80% by 2020 to be featured in communication materials.</p>	<p>Metro Vancouver has carried out community-based social marketing pilots in multi-family homes in order to develop best practices in reducing waste and improving recycling practices. From this work, it has developed a multi-family recycling tool kit for property managers that includes both blue box and food scraps information. The tool kit has been shared with municipalities and is being promoted to property management organizations.</p> <p>School Districts have been engaged on food scraps recycling to facilitate peer-to-peer learning, and share approaches to developing and initiating district-wide food scraps recycling programs.</p> <p>Metro Vancouver develops advertising and social media campaigns: Christmas “Create Memories not Garbage”, and Organics “Food isn’t Garbage” campaigns. These are targeted at citizens across the region, and public opinion surveys show that up to 25% of residents are aware of the campaigns and have taken some steps to reduce their waste. The food waste campaigns are aimed to both improve citizens’ participation in food waste recycling, and to reduce contamination of the compost stream.</p> <p>Metro Vancouver has developed and implemented a Love Food Hate Waste campaign based on the successful program developed in the UK. This waste reduction campaign aims to reduce the waste of food by addressing the barriers that lead to over-purchasing, improper storage, confusion around “best before” dates, and the reluctance to use leftovers.</p>
<p>1.3.2 MV Will: Develop and deliver a community-based social marketing business education plan, including business guides and other outreach programs to inform and educate businesses on waste reduction opportunities.</p>	<p>Metro Vancouver conducted pilot programs and developed new resource guides on food scraps reduction and recycling for businesses.</p> <p>Informed 1200 small businesses directly on the food scraps regulation through a program to recruit small businesses for a pilot study on food scraps recycling.</p> <p>Informed small business through their Business Improvement Areas (BIAs), Chambers of Commerce and Associations.</p> <p>Worked directly with 12 food businesses (bakery, restaurant and grocer) to initiate food scraps recycling, and capture their experiences to develop case studies as a demonstration to others.</p>
<p>1.3.3 MV Will: Develop a national zero waste marketing council so that cities across Canada can pool resources and develop common messaging, with national impact, on the need to reduce waste, resulting in informed and educated citizens on waste reduction opportunities.</p>	<p>This action is fulfilled under 1.1.1 which is Metro Vancouver’s formation of and support for the National Zero Waste Council. The National Zero Waste Council includes in its mandate the sharing of public education and communications resources, with a working group specifically dedicated to that purpose. This work includes best practices guides, and shared resource materials for active campaigns: http://www.nzwc.ca/focus/campaigns/Pages/default.aspx</p>
<p>1.3.4 Municipalities Will: Partner with and assist Metro Vancouver in the development and delivery of public and business information and education programs.</p>	<p>This is an ongoing collaborative relationship between Metro Vancouver and the member municipalities, coordinated through the REAC Solid Waste Sub-committee, as well as the Municipal Waste Reduction Coordinators and other municipal staff, involving the joint development</p>

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	and distribution of information and materials that support all public education strategies and actions of the ISWRMP.
(a) After suitable public information programs, expand disposal bans to include materials encompassed by new EPR programs and material for which new recycling markets are developed.	<p>In 2017, research and stakeholder engagement is underway to assess the viability of, or alternatives to, additional disposal bans on expanded polystyrene, and textiles.</p> <p>Disposal bans are in place for all materials included in EPR programs. Materials have been added as new EPR programs are put in place.</p>

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Strategy 2.1: Increase the opportunities for reuse	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.1.1 MV Will: Investigate financial and regulatory barriers which prevent or discourage the reuse of materials.</p> <p>2.1.2 MV Will: Investigate the effectiveness and adequacy of existing material exchange networks.</p> <p>2.1.3 MV Will: Bring forward appropriate measures which respond to the findings of 2.1.1 and 2.1.2.</p>	<p>Metro Vancouver conducted a feasibility study and trial of material salvage and reuse at its transfer stations. The results of the material salvage and reuse trial revealed limitations in acceptable materials that can be readily resold through salvaged material retailers. This information is used to inform the implementation of reuse programs at regional facilities.</p> <p>In 2017 the National Industrial Symbiosis Program’s (NISP) application to the federal Green Municipal Fund includes a funding commitment from Metro Vancouver for NISP to encourage and establish exchanges of waste materials between medium-to –large businesses in the region.</p>
<p>2.1.4 MV Will: Enhance partnerships with the Province, industry, academia and community groups to research and develop solutions to overcome barriers to reuse and recycling and new opportunities to re-engineer recycled material.</p>	<p>Metro Vancouver started a Sustainable Region Scholars program in 2016 in partnership with UBC, which helps connect academia to Metro Vancouver on regionally relevant projects including recycling and reuse.</p> <p>Metro Vancouver in collaboration with post-secondary institutions, member municipalities, and private industry has formed a Solid Waste Research Collaborative bringing together academia, industry and local governments to identify and form partnerships on applied research projects that enhances the region’s understanding and minimization of solid waste. The BC Municipal Waste Research Collaborative has launched a members-only website where projects are proposed, and results shared.</p>
<p>2.1.5 Municipalities Will: Work with Metro Vancouver to give effect to Strategy 2.1.</p>	<p>Municipal collaboration with Metro Vancouver in actions 2.1.1 through 2.1.4 is coordinated through the REAC Solid Waste Sub-committee, Municipal Waste Reduction Coordinators Committee and other municipal staff on an ongoing basis.</p>

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Strategy 2.2: Increase the effectiveness of existing recycling programs	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.2.1 MV Will: Implement disposal bans on materials that limit opportunities to achieve reuse, recycling, or energy recovery.</p> <p>(a) Work with facility operators, local municipalities, senior governments and the recycling industry to determine the impact and source of components of the waste stream, the consequence and feasibility of banning materials with the most negative impacts and the most suitable recycling options for those materials.</p>	<p>Following the 2015 implementation of a ban on the disposal of organics and clean wood, Metro Vancouver is looking at best practices in other locales and the technical viability of additional disposal bans on expanded polystyrene and textiles.</p>
<p>(b) Expand the monitoring and enforcement of disposal bans and enhance with effective communications to raise awareness of the bans.</p>	<p>[ACTION COMPLETED]</p> <p>Regional outreach and communication activities supporting awareness of bans were completed under action 1.3.4 which is ongoing collaboration between Metro Vancouver and the member municipalities. From 2010 to 2017 increased number of inspectors from 5 to 9 and number of inspections from 140,000 to 180,000 per year. In 2017, closed circuit technology was installed at the Waste-to-Energy Facility allowing inspection of loads being deposited into the bunker. Inspection rate at the facility increased from 1% to 20% of loads, consistent with other facilities.</p>
<p>(c) Analyze the effectiveness of disposal bans and possible alternative enforcement models including enforcement at source.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver worked with a Disposal Ban Effectiveness Working Group of haulers, recyclers and other stakeholders to review implementation of the disposal ban program and receive feedback on proposed changes and communication tools.</p> <p>Metro Vancouver piloted a voluntary hauler incentive program and continues to work with stakeholders to improve disposal bans.</p> <p>A proposed new regulatory framework would require commercial hauler licensing, and as part of the requirements, haulers would be obligated to provide recycling containers at generators when containers are provided by a third party</p>
<p>(d) After suitable public information programs, expand disposal bans to include materials encompassed by new EPR programs and material for which new recycling markets are developed.</p>	<p>In 2017, Metro Vancouver is conducting research and consulting with interested parties on potential future disposal bans on expanded polystyrene (EPS) and textiles. Research on EPS includes existing local recycling options and discussions with stakeholders from production to transport to disposal. Research on textiles recycling includes a strong emphasis on strategies to increase the existing re-use market in the region.</p>

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<p>2.2.2 MV Will: Provide ongoing information for businesses and residents of recycling opportunities.</p>	<p>Metro Vancouver is working with business and housing associations to share information and resources about recycling opportunities, particularly organic wastes in light of the new organics disposal ban. Metro Vancouver offers resource materials such as How-to Guides and Case Studies, and presentations as requested.</p>
<p>(a) Continue and upgrade a regional web-based source of information on recycling opportunities for businesses and residents.</p>	<p>MetroVancouverRecycles.org and the WeRecycle app are continually updated to ensure all data is accurate.</p>
<p>(b) Keep municipalities fully informed as to recycling collection and drop facilities and changes to policies and facilities.</p>	<p>This is an ongoing activity between Metro Vancouver and its member municipalities which is facilitated through the REAC Solid Waste Subcommittee and other municipal staff. This includes annual surveys and compilation of municipal waste and recycling services.</p>
<p>(c) Provide outreach services.</p>	<p>This is primarily covered under strategy 1.3.</p>
<p>(d) Work with other information sources to achieve maximum harmonization possible.</p>	<p>Metro Vancouver and its members are working collaboratively with RecycleBC (formerly MMBC) to share design specifications for streetscape collection bins with local governments and other property owners.</p> <p>Worked with member municipalities to develop for example:</p> <ul style="list-style-type: none"> • Consistent messaging and vocabulary on the food scraps and clean wood bans. • Agree to and promote a consistent colour scheme for public recycling facilities and receptacles. • Provide recommendations to Business Associations on messaging and responses to common questions to encourage consistency. • Provide similar information to NGOs operating recycling hotlines <p>Engage with private and NGO interests in discussion on consistent messaging, icons and colour schemes for recycling programs.</p>
<p>2.2.3 MV Will: Increase the efficiency and consistency of recycling collection services across the region.</p>	<p>Approximately one-third of residents in Metro Vancouver receive recycling service directly from RecycleBC (formerly MMBC). Many others are served by their local municipality under contract to RecycleBC. As a result, collection of recyclables from residents has now been standardized for virtually all single-family residents in the region.</p> <p>More than 97% of single family homes now receive organics collection.</p> <p>New proposed hauler licensing would help ensure all multifamily and commercial /institutional generators have recycling containers.</p>
<p>(a) Work with municipalities to review materials accepted for recycling from residential and ICI sources</p>	<p>[ACTION COMPLETED]</p> <p>Approximately one-third of residents in Metro Vancouver receive recycling service directly from RecycleBC (formerly MMBC). Many others are served by their local municipality under contract to RecycleBC. As a result, collection of recyclables from residents has now been standardized for virtually all single-family residents in the region. Under provincial regulation, an equivalent EPR program for the ICI sector is expected in the coming years.</p>

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<p>(b) In collaboration with municipalities, undertake a business case review of the residential and ICI waste and recycling collection services over the region to determine and implement the appropriate level of consistency between municipalities. Where appropriate, Metro Vancouver will develop model policies or bylaws to assist municipalities in achieving consistency.</p>	<p>Approximately one-third of residents in Metro Vancouver receive recycling service directly from RecycleBC (formerly MMBC). Many others are served by their local municipality under contract to RecycleBC. As a result, collection of recyclables from residents has now been standardized for virtually all single-family residents in the region.</p> <p>As reported to the Metro Vancouver Board in October 2016, municipal policies and programs (such as mandatory service requirements or diversion plans) were in place to encourage recycling and/or organics collection for multi-family residents (in 15 member municipalities), and for ICI businesses (in 10 municipalities).</p>
<p>(c) Analyze the effectiveness of pricing strategies and other economic instruments to encourage additional recycling.</p>	<p>[ACTION COMPLETED]</p> <p>In 2017, Metro Vancouver finalized a consultant study to evaluate vulnerabilities in the Recycling network. The study concluded that much of the ongoing activities and actions already undertaken by Metro Vancouver were appropriate to protect or improve the resiliency of the recycling network.</p>
<p>2.2.4 MV Will: Establish Eco-Centres.</p> <p>(a) Establish a stakeholder and municipal work group to determine the scope, terms and conditions and the relationship to existing and planned EPR programs and municipal recycling depots for participating municipalities and industries.</p> <p>(b) Develop the model of Eco-Centres to include numerous, small scale, one-stop-drop centres for recycling and small quantity drop-off disposal.</p> <p>(c) With municipalities, determine the terms and conditions for participating municipalities and industries and develop appropriate business cases.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver has implemented a model where communities served by a transfer station request and pay for recycling services at that site. The model is in place at Coquitlam Transfer Station and North Shore Transfer Station.</p>
<p>(d) After determining terms and conditions, establish the first Eco-Centre in Surrey to replace commitment for residential drop off facility in the 1995 Plan.</p> <p>(e) Progressively expand the Eco-Centre system across the region as municipal business cases determine.</p>	<p>In partnership with Metro Vancouver, the City of Surrey has sited a suitable location for a new small vehicle waste and recycling drop-off facility. Work is currently underway to design and construct this facility under the cost sharing principles for developing Eco-Centres.</p>

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<p>2.2.5 MV Will: Promote recycling at festivals and events.</p> <p>(a) Develop a Zero Waste toolkit for festivals and events.</p> <p>(b) Continue to work with municipalities, EPR groups and local community groups to implement waste minimization and recycling at community festivals and events, including conferences and tradeshow.</p> <p>(c) Provide outreach services.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver developed resource materials for public event recycling, including Zero Waste Stations (signage and bins for public event recycling). Many of these activities were coordinated through action 1.3.4 in collaboration with member municipalities. The Zero Waste Stations have been donated to two local non-profit groups (Ridge Meadows Recycling Society and the Tzu Chi Society who maintain the stations and lend them out for use by others.</p>
<p>2.2.6 MV Will: Work with school districts and individual schools to promote waste reduction and recycling.</p> <p>(a) Develop instructional programs that encourage waste reduction and recycling both within the schools and at home.</p>	<p>Metro Vancouver K-12 School & Youth Leadership Programs promote waste reduction awareness and actions in schools and communities. High school youth leaders, K-12 students, K-12 teachers, school districts, and partners in sustainability education are targeted through the following core and ongoing activities:</p> <ul style="list-style-type: none"> i) Delivery of teacher professional development workshops to support integration of 4R's and sustainability through K-12 curriculum; ii) Delivery of youth leadership programs, including action planning workshops, leadership clinics and symposiums to inspire, equip and support Metro Vancouver high school youth leaders to influence waste reduction and sustainability initiatives in school communities, and; iii) Development of materials to support and enhance of solid waste management facility tours for school audiences.
<p>2.2.7 Municipalities Will: Work with Metro Vancouver on actions designed to:</p> <p>(a) Implement effective disposal bans for collection of municipal waste at source.</p> <p>(b) Inform businesses and residents of recycling opportunities.</p> <p>(c) Increase the efficiency and consistency of recycling collection services over the region.</p>	<p>The implementation of disposal bans and the supporting communications with businesses and residents is primarily covered under action 2.2.2(b) which is the ongoing activity between Metro Vancouver and its member municipalities facilitated through the REAC Solid Waste Sub-committee and other municipal staff.</p>
<p>(d) Establish Eco-Centres</p>	<p>[ACTION COMPLETED]</p> <p>This has been completed under action 2.2.4 (development of an Eco-Centres Business Model).</p>
<p>(e) Promote recycling at community events and festivals.</p>	<p>[ACTION COMPLETED]</p> <p>This has been completed under action 2.2.5 (development of resource materials for public event recycling).</p>
<p>(f) Work with school districts and individual schools to promote waste reduction and recycling.</p>	<p>This is primarily covered under action 2.2.6 which consists of the Metro Vancouver K-12 School & Youth Leadership Programs which promote waste reduction awareness and actions in schools and communities.</p>

Strategy 2.3: Provide opportunities to increase private sector recycling	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.3.1 MV Will: Facilitate the siting of private sector recycling activities.</p> <p>(a) Review the GVS&DD Solid Waste Regulatory Bylaw to facilitate the siting of municipal solid waste facilities that meet municipal bylaws.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver revises its Solid Waste Regulatory Bylaw annually, and continues to seek viable options for promoting recycling within a financially sustainable public and private sector solid waste management network. Mapping of existing private sector facilities and a review of municipal zoning bylaws did not identify opportunities to promote the siting of private recycling facilities through bylaws. At this time, the main impediment appears to be the high cost of industrial land in the region, which is beyond the control of regional or municipal bylaws. Metro Vancouver continues to monitor the issue and the work of member municipalities in this area.</p>
<p>2.3.2 MV Will: Foster research and market development for recycled materials.</p> <p>(a) Evaluate a business case for a regional scale recycling service delivery model.</p> <p>(b) Review desirability, feasibility and opportunity for establishing a non-profit organization to facilitate the development of recycling businesses and markets, along the lines of the ‘London Remade’ model in the U.K.</p> <p>(c) Subject to the results of 2.3.2 (a) and (b), establish a regional role in processing and marketing of recycled materials, a land acquisition strategy for required recycling facilities, and enhanced policy-based initiatives to promote local recycled content in consumer goods.</p>	<p>[ACTION COMPLETED]</p> <p>In 2017, Metro Vancouver finalized a consultant study to evaluate vulnerabilities in the Recycling network. The study concluded that much of the ongoing activities and actions undertaken by Metro Vancouver were appropriate to protect or improve the resiliency of the recycling network. Furthermore, the increased role of EPR programs (e.g., packaging and printed papers) means that post-collection/recycling processing is no longer within the jurisdiction of local government.</p> <p>The National Zero Waste Council was launched in October 2013. The Council works as a national level advocacy group to address upstream recycling market challenges particularly through the redesign of products and packaging.</p>
<p>2.3.3 Municipalities Will: Facilitate the siting of private sector recycling activities.</p> <p>(a) Review zoning bylaws to remove unnecessary impediments to and encourage recycling and material recovery activities in appropriately zoned areas.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver staff reviewed municipal zoning bylaws and interviewed municipal planners and other municipal staff. The review did not identify unnecessary municipal barriers to the development of private recycling facilities. At this time, the main impediment appears to be the high cost of industrial land in the region.</p>
<p>2.3.4 Municipalities Will: Work with Metro Vancouver on the evaluation of regional scale recycling facilities and development of recycling markets.</p>	<p>[ACTION COMPLETED]</p> <p>In 2017, Metro Vancouver finalized a consultant study to evaluate vulnerabilities in the Recycling network. The study concluded that much of the ongoing activities and actions undertaken by Metro Vancouver were appropriate to protect or improve the resiliency of the recycling</p>

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	network. Furthermore, the increased role of EPR programs (e.g., packaging and printed papers) means that the responsibility for post-collection/recycling processing is no longer within the jurisdiction of local government.
2.3.5 Actions Requested of Other Governments and Agencies. Provincial and Federal Governments to identify and establish minimum post-consumer recycled content requirements for consumer goods.	The Provincial government continues to require EPR programs to report on the 'end-fate' (e.g., reuse, recycling, recovery or garbage) of all their collected materials. Continuous improvements requirements encourage EPR programs to find appropriate markets for collected materials.

Strategy 2.4: Target demolition, land clearing and construction (DLC) sector for increased reuse and recycling	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.4.1 MV Will: In collaboration with municipalities and industry groups, develop a process to require DLC recycling at construction/demolition sites.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver in collaboration with member municipalities developed a sample municipal bylaw for encouraging Construction and Demolition (C&D) recycling. Six municipalities have adopted regulatory measures that establish recycling requirements for demolition material and others are considering adopting a regulatory program. Municipalities continue to share information as they implement their respective demolition recycling requirements.</p>
<p>2.4.2 MV Will: Implement waste reduction strategies directed toward diverting DLC waste from disposal while supporting opportunities for beneficial use.</p> <p>(a) Encourage the role of building supply retailers and producers in the collection of DLC material for recycling.</p> <p>(b) Provide areas for separated recyclable DLC materials at Eco-Centres and at transfer stations as they are upgraded.</p>	<p>Metro Vancouver has provided space at existing regional solid waste facilities for the drop-off of clean wood for recycling. Metro Vancouver is including infrastructure for reuse and recycling of DLC materials in the design of new facilities in keeping with the eco-centres business model.</p> <p>Review of current management practices in the residential C&D industry is underway to identify opportunities to minimize contamination of recyclable material and illegal dumping of hazardous C&D material.</p> <p>Metro Vancouver also publishes diversion rates for construction and demolition processing facilities.</p>
<p>2.4.3 MV Will: Review existing DLC recycling and processing capacity, project future needs and develop a strategy to address any identified gaps.</p>	<p>Metro Vancouver conducted a study to identify future needs for regional C&D processing capacity, which included recommendations for a strategy to support the introduction of more sophisticated C&D processing infrastructure.</p> <p>Metro Vancouver continues to monitor C&D waste flows, trends, and barriers to recycling.</p> <p>Metro Vancouver has initiated a new study examining options to support C&D recycling.</p>
<p>2.4.4 Municipalities Will: Work with Metro Vancouver to develop a process to require DLC recycling at construction/demolition sites.</p> <p>(a) Review municipal DLC permitting processes with a view to requiring waste management plans as a condition of such permits.</p> <p>(b) Review the desirability and feasibility of deposit systems or other financial incentives to</p>	<p>[ACTION COMPLETED]</p> <p>As stated in 2.4.1, several municipalities have implemented tools to encourage demolition material recycling through material management plans and/or deposit systems.</p>

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increase enforcement of DLC waste management plans.	
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Strategy 2.5: Reduce paper and paperboard being disposed	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.5.1 MV Will: In collaboration with municipalities, businesses and non-profit organizations, conduct pilot programs to determine the most effective method of reducing unwanted junk mail and other publications and act accordingly on the results.</p> <p>2.5.2 MV Will: Promote reduced paper use and increase paper recycling opportunities in the community and businesses.</p>	<p>[ACTION COMPLETED]</p> <p>Junk mail, phone directories, newspapers and other publications delivered to residents are regulated items in Packaging and Printed Paper EPR. As a result, the ability to influence options to manage these materials is no longer within the jurisdiction of local government.</p>
<p>(a) Carry out a community-based social marketing campaign to determine and overcome barriers to reducing the use of and increasing the recycling of paper in schools and community facilities.</p>	<p>This is largely covered under actions in 1.3.1 and 2.2.6 which involve carrying out community-based social marketing programs for neighborhoods and schools to promote waste reduction and increase recycling.</p>
<p>(b) Carry out a targeted outreach campaign to business to determine and overcome barriers to reducing the use of and increasing the recycling of paper.</p>	<p>Supported by actions under 2.2.2.</p>
<p>2.5.3 Municipalities Will: Collaborate with Metro Vancouver in junk mail reduction pilot programs and community-based social marketing programs in community facilities.</p>	<p>[ACTION COMPLETED]</p> <p>Junk mail, phone directories, newspapers and other publications delivered to residents are regulated items in Packaging and Printed Paper EPR. As a result, there is a limited role for local governments to influence options to manage these materials.</p>

Strategy 2.6: Target organics for recycling and energy recovery	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.6.1 MV Will: Evaluate options for processing and utilization of organics with biosolids and other utility residuals.</p>	<p>Metro Vancouver evaluated a wide range of different concepts to integrate the replacement of the Lions Gate Wastewater Treatment Plant with new community spaces, commercial ventures, environmental features, and opportunities to co-manage solid wastes such as source-separated organics. Results of the business casing indicated that the cost of co-processing large amounts of source-separated organics together with wastewater residuals such as biosolids would be cost-prohibitive. However, a limited amount and types of select source-separated organics continue to be processed at suitable existing wastewater treatment facilities operated by Metro Vancouver.</p>
<p>2.6.2 MV Will: Divert organics from the waste stream. (a) Establish additional organics processing facilities.</p>	<p>In 2011, the Metro Vancouver Board approved a Regional Organics Strategy that stipulated that provision of composting and biofuel production capacity would be left to the private sector and individual member municipalities, unless they were unable to maintain an adequate level of service. Metro Vancouver continually monitors the regional capacity for processing organics.</p> <p>A new municipal facility, the Surry Biofuels Facility, is expected to be operating by the end of 2017.</p>
<p>i) establish a system for monitoring emissions from organics processing facilities including bioaerosols.</p>	<p>[ACTION COMPLETED]</p> <p>Under provincial legislation, Metro Vancouver has the delegated authority for air pollution control and air quality management in the region. Metro Vancouver issues permits that include requirements for the management of odour and other air emissions, as well as monitoring and assessment. The regulatory bylaw is updated annually to reflect changing technology and knowledge.</p>
<p>(b) Determine which paper and paperboard products are suitable for processing at an organics management facility.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver convened a Foodware and Food-Soiled Paper Task Group to identify potential issues and solutions regarding food-soiled paper and the compostable foodware value chain. The Group explored the complexity of the food-soiled paper value chain identified key challenges and recommendations for moving forward. As a result, Metro Vancouver works through the Product Design & Packaging Working Group of the National Zero Waste Council, whose current focus is to simplify compostable product design and increase transparency in the marketplace around recyclable and compostable packaging. The Task Group also concluded that food-soiled paper and compostable foodware should not be banned from disposal at this</p>

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	time, due to their varying acceptability in private organics processing facilities.
<p>(c) In collaboration with municipalities, develop and implement a work plan for the diversion of organic waste, including food waste from:</p> <ul style="list-style-type: none"> i) single family residences ii) multi-family residences iii) ICI sector 	<p>[ACTION COMPLETED]</p> <p>Under an ongoing collaborative relationship between Metro Vancouver and the member municipalities, Metro Vancouver supports residents of single family homes through online searchable information focussed on mobile applications, establishing and promoting a hotline, and providing translated educational materials into additional languages.</p> <p>Metro Vancouver supports residents of multi-family homes through convening property managers, capturing experiences for case studies, engaging member municipalities on their pilot multi-family programs to share learning, developing and promoting resources such as the Multi-Family Recycling Toolkit to help improve recycling in their buildings, including food scraps.</p> <p>The <i>Food isn't Garbage</i> campaign informs and encourages all groups to recycle organic materials. The <i>Love Food Hate Waste</i> campaign focusses on food waste reduction.</p> <p>Work with the ICI sector is outlined in 1.3.2</p>
<p>(d) Develop and implement supporting communication programs for 2.6.2 (c).</p>	<p><input type="checkbox"/> Action completed <input type="checkbox"/> Action ongoing</p> <p>Metro Vancouver has conducted ICI audience research, best practice pilots with local sports teams (Vancouver Whitecaps at Swangard Stadium, Vancouver Canucks), delivered waste reduction and recycling information at ICI trade shows, and has developed an organics waste diversion guide for restaurants, and new web-based resources for ICI businesses.</p> <p>See also action 1.3.4</p>
<p>(e) Ban all compostable organics allowed in residential green bins from disposal to landfills and all forms of waste-to-energy, except anaerobic digestion.</p>	<p>[ACTION COMPLETED]</p> <p>This action was completed under 1.2.1, Metro Vancouver's implementation of the disposal ban for organics.</p> <p>See also actions 2.2.1, 2.6.2, and 2.7.5</p>
<p>2.6.3 Municipalities Will: In collaboration with Metro Vancouver, develop and implement a work plan, including appropriate communication programs for the diversion of organic waste from:</p> <ul style="list-style-type: none"> i) single family residences, ii) multi-family residences, iii) the ICI sector 	<p>This is primarily covered under 1.3.4 which is ongoing collaboration between Metro Vancouver and the member municipalities for joint development and sharing of information and materials</p> <p>See also action 2.6.2(c)</p>

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<p>(a) Municipalities will divert organics from the waste stream to a Metro Vancouver or alternative licensed organics processing facility.</p> <p>(b) Municipalities will report the tonnage of diverted organic waste to Metro Vancouver in the event that organics are delivered to licensed non-regional processing facilities.</p>	<p>[ACTION COMPLETED]</p> <p>More than 97% of all the single-family homes in Metro Vancouver receive organics recycling services from their respective municipalities. Many of the member municipalities also provide service to multi-family residences, and some offer or are piloting services to schools and businesses.</p> <p>All municipalities provide regular tonnage information to Metro Vancouver.</p>
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Strategy 2.7: Target wood for reuse, recycle, and energy recovery	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.7.1 MV Will: Encourage reuse of wood.</p> <p>(a) Examine and, where feasible, implement incentives for reuse and remove barriers to reuse of wood waste.</p>	<p>In 2016 Metro Vancouver collaborated with City of Vancouver to review the successes and challenges other jurisdictions have had with respect to reuse of wood. The work included a tour of the City of Portland facilities for resale of demolition lumber. Metro Vancouver participated in a City of Vancouver workshop on getting to zero demolition and construction waste by 2040.</p> <p>Metro Vancouver continues to collaborate with the reused building sector to improve the end markets for used wood in the region.</p> <p>This is also covered under 2.1.1 which is Metro Vancouver’s research into higher uses for wood waste.</p> <p>See also actions 2.1.4, and 2.4.2(a)</p>
<p>(b) Develop and implement information and education programs on the reuse and effective recycling of wood and other DLC waste.</p>	<p>[ACTION COMPLETED]</p> <p>This was completed under 1.3.4 which is ongoing collaboration between Metro Vancouver and the member municipalities for the joint development and sharing of information and materials.</p>
<p>2.7.2 MV Will: Collect wood for reuse, recycling, and energy recovery at regional transfer stations and Eco-Centres.</p>	<p>[ACTION COMPLETED]</p> <p>This was completed under 2.4.2 which is Metro Vancouver’s provision of space at most existing and future regional facilities for collection of clean wood and reusable building materials.</p>
<p>2.7.3 MV Will: Encourage highest and best use for wood following waste management hierarchy in the following priority:</p> <p>(a) Reuse wood for comparable structural and non-structural applications.</p> <p>(b) Recycle wood fibre into other fibre based products.</p> <p>(c) Compost wood with other organic materials.</p> <p>(d) Digest wood to produce biofuels.</p> <p>(e) Process wood as a fuel for energy production.</p>	<p>Metro Vancouver aims to support the diversification of wood waste usage. Current actions include:</p> <ol style="list-style-type: none"> 1. Decreasing the clean wood disposal ban threshold from 10% to 5% January 1, 2017 for waste loads delivered to Regional facilities. 2. Engaged the Centre for Advanced Wood Processing at UBC to build on the research for market alternatives for clean wood. UBC determined the most practical use for clean wood is limited to particle board manufacturing at this time and in this location. 3. Understanding air quality implications of sending hard-to-recycle wood to district energy or cement kilns.
<p>2.7.4 MV Will: Pass by-laws as required to support highest and best use of wood as outlined in 2.7.3.</p> <p>2.7.5 MV Will: Ban all wood from landfill disposal.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver introduced a Clean Wood Disposal Ban at regional facilities on January 1, 2015. Metro Vancouver conducted research into higher uses and markets for wood waste, but cannot identify further regulatory measures due to high costs of land, inability to control the flow of wastes, and technology limitations.</p>

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<p>2.7.6 Other Governments & Agencies Will: Provincial Government to expand the inclusion of the reuse of wood in building codes.</p>	<p>In the CCME report “Progress Report on the Canada-wide Action Plan on EPR”, CCME scaled back performance expectations for the Action Plan. As a result, the timeline for provincial actions related to EPR for construction and demolition materials, or other potential measures adopted in the BC Building Code is unknown.</p>
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Strategy 2.8: Target plastics for increased recycling	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.8.1 MV Will: Expand the recycling of plastics in the residential and commercial sectors.</p> <p>(a) Establish a standard for municipal programs for collection of plastics based on market strength.</p>	<p>[ACTION COMPLETED]</p> <p>Approximately one-third of residents in Metro Vancouver receive recycling service directly from RecycleBC (formerly MMBC). Many others are served by their local municipality under contract to RecycleBC. As a result, collection of recyclables from residents is mostly standardized. Under provincial regulation, an equivalent EPR program for the ICI sector is expected in the coming years.</p>
<p>(b) In cooperation with retail partners and municipalities, undertake social marketing pilot programs to reduce the use of disposable take-out food and beverage packaging including plastic and other disposable bags.</p>	<p>This is primarily covered under actions 1.3.2 and 1.3.4 which involve the collaboration of member municipalities with Metro Vancouver to develop and deliver programs and education for businesses on waste reduction opportunities.</p>
<p>2.8.2 Municipalities Will: Work with Metro Vancouver on programs to reduce the use of disposable take-out food and beverage packaging including plastic and other disposable bags.</p>	<p>[ACTION COMPLETED]</p> <p>This initiative has been supplanted by the new Provincial regulations mandating that single family residential recycling programs (and eventually multifamily recycling, public spaces recycling, and ICI recycling programs) for packaging and printed papers be part of an EPR program to be administered by industry.</p> <p>Metro Vancouver continues to provide input, on behalf of our member municipalities, to the industry stewards on the development and implementation of their stewardship plans.</p>
<p>2.8.3 Other Governments & Agencies Will: The Provincial Government to develop EPR programs for all plastics that provide incentives for alternatives to non-recyclable plastics.</p> <p>2.8.4 Other Governments & Agencies Will: The Provincial and Federal Governments to require all plastic material sold in BC to have a material code identifying its composition.</p>	<p>[ACTION COMPLETED]</p> <p>Approximately one-third of residents in Metro Vancouver receive recycling service directly from RecycleBC (formerly MMBC). Many others are served by their local municipality under contract to RecycleBC. As a result, collection of recyclables from residents is mostly standardized. Under provincial regulation, an equivalent EPR program for the ICI sector is expected in the coming years.</p>

Strategy 2.9: Target multi-family and industrial, commercial and institutional (ICI) sectors to improve diversion rates	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.9.1 MV Will: Develop bylaws to require recycling in all multi-family and commercial buildings and complexes.</p> <p>(a) Develop a model bylaw and enforcement model to require recycling in multi-family and commercial buildings.</p>	<p>Metro Vancouver reported out on programs and policies to encourage recycling in the multi-family and commercial/institutional sector in 2016. Metro Vancouver continues to work with member municipalities to implement further programs and policies to encourage recycling in multi-family and commercial complexes.</p> <p>2016 phone surveys of multi-family and commercial buildings showed that the majority of multi-family and commercial buildings have organics recycling as a result of the regional organics disposal ban.</p>
<p>(b) Create an advisory service for recycling programs for multifamily and commercial buildings.</p>	<p>[ACTION COMPLETED]</p> <p>This is largely covered under actions 1.3.1 and 1.3.4 which involves the collaboration of member municipalities with Metro Vancouver to develop and deliver community-based marketing programs to inform and educate citizens on waste reduction opportunities.</p> <p>In addition, Metro Vancouver co-founded (with UBC) a municipal waste Research Collaborative to identify and carry out waste-related research in the region. An offshoot of that collaborative is a Multi-Family Organics Diversion Working Group.</p>
<p>2.9.2 Municipalities Will: Work with Metro Vancouver to implement recycling in multi-family and commercial buildings.</p>	<p>This is largely covered under actions 1.3.1 and 1.3.4 which involves the collaboration of member municipalities with Metro Vancouver to develop and deliver community-based marketing programs to inform and educate citizens on waste reduction opportunities.</p>
<p>2.9.3 Other Govt’s & Agencies Will: The Provincial Government to modify the BC Building Code to require that space be provided for recycling collection, sorting and pick-up in multi-family residential and commercial buildings.</p>	<p>Under action 2.9.1, Metro Vancouver updated the technical specifications for recycling storage space and access to reflect changes to collection services resulting from RecycleBC (formerly MMBC)’s program. Several municipalities have adapted the technical specifications to their needs and implemented them as part of development permit requirements.</p> <p>The Provincial government may choose to include that specification in a revision to the Provincial Building Code.</p>

Strategy 2.10: Develop contingency plans for the loss of recycling markets	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.10.1 MV Will: Manage diverted materials in accordance with the requirements of the Environmental Management Act and regulations in that material will not be disposed unless all feasible opportunities for higher uses of the materials have been taken.</p> <p>2.10.2 Municipalities Will: Manage diverted materials in accordance with the requirements of the Environmental Management Act and regulations in that material will not be disposed unless all feasible opportunities for higher uses of the materials have been taken.</p>	<p>[ACTION COMPLETED]</p> <p>In 2017, Metro Vancouver finalized a consultant study to evaluate vulnerabilities in the Recycling network. The study concluded that much of the ongoing activities and actions undertaken by Metro Vancouver were appropriate to protect or improve the resiliency of the recycling network. Furthermore, the increased role of EPR programs (e.g., packaging and printed papers) means that post-collection/recycling processing is no longer within the jurisdiction of local government.</p> <p>Compliance with applicable regulations is an ongoing responsibility with all actions associated with the ISWRMP. As described in actions 2.1.1 and 2.3.2, Metro Vancouver is engaged in various activities to improve markets for key recycled materials, especially compost and reusable building materials.</p>

Strategy 2.11: Integrated Utility Management Advisory Committee	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>2.11.1 MV Will: Establish a new overarching committee, the Integrated Utility Management Advisory Committee (IUMAC), to advise Metro Vancouver on plan implementation, particularly from the perspectives of integrated planning and resource recovery across utility systems.</p>	<p>[ACTION COMPLETED]</p> <p>In 2015, Metro Vancouver obtained Ministry approval to modify its approach and separate the monitoring of the solid and liquid waste utilities' Plans.</p> <p>ISWRMP implementation is reviewed and critiqued by the Zero Waste Committee, a functional committee of the GVS&DD Board. As reports to the Zero Waste Committee and Board are public, their reviews are supplemented by public input.</p>

Strategy 3.1: Use waste-to-energy to provide electricity and district heating	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>3.1.1 MV Will: Continue use of existing waste-to-energy facility in Burnaby.</p> <p>(a) Subject to the limitations established in the section titled “Flow Control”, use the facility at its current usage and capacity of 280,000 tonnes per year to recover available energy in the waste remaining after recycling for district energy and electricity generation.</p>	<p>Continue to investigate opportunities for connecting the Waste-to-Energy Facility to (a) district energy system(s):</p> <ul style="list-style-type: none"> • Meetings on a staff level with the City of Burnaby and the City of Vancouver to discuss opportunities • Hired consultants to conduct a pre-feasibility technical/financial study (completion in 2016) of the broad range of potential customers in both Burnaby and Vancouver for the short- and long-term. <p>Continue to work with WTEF facility operator to maximize electricity generation from the facility:</p> <ul style="list-style-type: none"> • Finalized a new EPA with BC Hydro for electricity sales over the next 12 years • Completed a 5-year overhaul of the turbo generator during an unplanned outage to repair a damaged turbine blade.
<p>(b) Continue to meet the monitoring and emission requirements in Appendix A.</p> <p>(c) Continue to improve environmental performance of the facility with improved technologies and monitor performance to ensure compliance with applicable legislation and regulations.</p> <p>(d) Operating performance will continue to be reported on a regular and timely basis and will also be</p>	<p>(b) In 2015, the existing Facility was in full compliance with the standards set out in the ISWRMP (Appendix A).</p> <p>In 2016 the Facility had a one hour CO exceedance, the maximum CO value was 56.0 mg/m³; the CO limit is 55.0 mg/m³. The Facility was in full compliance with all other standards set out in the ISWRMP.</p> <p>Per the ISWRMP, compliance summaries were reported monthly to the Ministry of Environment.</p> <p>The Ministry of Environment issued an Operational Certificate for the existing Waste-to-Energy Facility in December 2016; this Certificate incorporates the emission objectives outlined in the Ministry’s 2011 Policy “Guideline for Emissions from Municipal Solid Waste Combustion”.</p> <p>Year to date 2017, the Facility is in full compliance with the standards set out in the Operational Certificate.</p> <p>(c) Metro Vancouver has completed a NOx reduction project resulting in a 53% reduction in NOx emissions. NOx emissions meet the requirements in the Operational Certificate.</p> <p>Metro Vancouver has completed preliminary engineering of an Acid Gas Reduction Project to ensure the facility can meet the lower acid gas limits as outlined in the Operational Certificate. The upgrade of the existing WTEF auxiliary gas burners has also commenced. Once installed, the upgraded burners will enable the WTEF to maintain better combustion zone temperatures and enhance CO emissions control.</p> <p>(d) Operating performance is reported to Ministry of Environment, Fraser Health Authority and City of Burnaby on a monthly basis.</p>

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<p>available on the Metro Vancouver web site.</p> <p>(e) The waste-to-energy facility in Burnaby will comply with applicable legislation and operating contracts may include penalties for any violations of performance criteria.</p>	<p>Emission data are posted on Metro Vancouver’s website quarterly following receipt of manual stack test results.</p> <p>Metro Vancouver will submit an Internet Publication Plan to the Ministry for approval within 6 months of the issuance of the Operational Certificate.</p> <p>e) Metro Vancouver’s Waste-to-Energy Facility in Burnaby continues to comply with all legislation. Metro Vancouver is completing and submitting a number of plans required by the Operational Certificate. Plans include an internet publication plan that will enhance information on facility performance available on the internet.</p>
<p>3.1.2 MV Will: Expand the use of waste-to-energy.</p> <p>(a) Establish up to 500,000 tonnes per year of new waste-to-energy capacity within the region in one or more facilities.</p> <p>(b) Ensure implementation of new waste-to-energy capacity maximizes energy recovery for use in district heating, production of alternative fuels, industrial applications and electricity generation.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>(c) Monitor trends in waste reduction, recycling and waste flows and implement additional waste-to-energy capacity if, and only if, justified on the basis of these trends.</p>	<p>Waste flows and trends are monitored on a regular basis by Metro Vancouver as a component of 1.1.8 the results of which are used for forecasting system needs and adjustments.</p>
<p>(d) Scale any additional waste-to-energy capacity so that total waste-to-energy capacity in the region does not exceed the most probable minimum waste flow projected over the economic life of those facilities.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>(e) Operating performance will be reported on a regular and timely basis and will also be available on the Metro Vancouver web site. Any new waste-to-energy facility will comply with applicable legislation and operating contracts may include penalties for any violations of performance criteria.</p>	<p>The procurement process for New WTE has been discontinued.</p>

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<p>3.1.3 MV Will: Locate new waste-to-energy capacity within the Region on the basis of: site availability; suitability of site for providing district heating from recovered energy; potential for site to optimize network of transfer stations; results of local screening level impact assessment and triple bottom line analysis; and results of community consultation process for each potential site.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>3.1.4 MV Will: Ensure that new waste-to-energy facilities are designed to maximize the environmental, financial and social benefits of facilities.</p> <p>(a) Evaluate cost/benefits of proposed new facilities over their lifetime, including construction, commissioning, operation and maintenance, future retrofits and decommissioning impacts, and ownership structure.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>(b) Conduct an environmental impact assessment of a waste-to-energy facility(ies), based on applicable provincial and federal government requirements, including an assessment of human health risk acceptable to the applicable health authority.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>(c) Evaluation criteria will include: cost; use of best available commercial technology; air emission and health impacts; GHG emissions; alignment with sustainability principles; electricity, district heating and alternative fuel production; beneficial use of ash; metals recovery; potential local job creation; and opportunities for research and education.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>3.1.5 MV Will: Recover metals, ash or other residues from new and existing waste-to-energy facilities for beneficial use.</p> <p>(a) Work with regulatory agencies to identify and remove barriers to beneficial use of ash.</p>	<p>Additional bottom ash processing for non-ferrous metal recovery is expected to improve ash quality for beneficial use.</p> <p>A study is currently underway to explore options for bottom ash beneficial use along with C&D materials.</p>
<p>(b) Maximize metal recovery from the waste stream after recycling.</p>	<p>In October 2016 Metro Vancouver approved a Non-Ferrous Recovery Project to increase the existing recovery of ferrous metal content from the bottom ash (e.g., iron and steel) and add the recovery of the non-ferrous metal component (e.g. aluminum and copper). This project should be operational in late 2017.</p>

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<p>(c) Process bottom and fly ash to generate products for beneficial use. (d) Use processed bottom and fly ash beneficially for highest value applications available.</p>	<p>Expansion of beneficial reuse projects are on hold at this time. Beneficial reuse projects require Ministry of Environment assessment and approval in order to proceed. Existing reuse of ferrous metal continues, the expansion to include non-ferrous underway (reference 3.1.5(b)).</p>
<p>(e) If beneficial use of a residue is not reasonably available, dispose of the residue in accordance with applicable legislation.</p>	<p>Fly ash is being shipped to Columbia Ridge in Oregon, following a procurement process completed in 2017. Bottom ash is currently being disposed at Vancouver Landfill in accordance with applicable legislation.</p>
<p>3.1.6 MV Will: Recover energy from regional utility materials that cannot be recycled, including liquid waste and water utilities. (a) Recover energy from drinking water treatment processes, such organic filter media that cannot be recycled. (b) Use waste-to-energy to process grit and screenings from wastewater treatment for beneficial uses, where appropriate. (c) Use reclaimed water from wastewater treatment plants in waste-to-energy steam generation or district heating, if viable.</p>	<p>[ACTION COMPLETED]</p> <p>Drinking water residuals are being used at Lafarge. All wastewater treatment plant screenings are being managed at the Waste to Energy Facility. The GVS&DD Board approved energy recovery from Lions Gate Wastewater Treatment Plant on September 22, 2017.</p>

Strategy 3.2: Recover energy from other solid waste management facilities	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>3.2.1 Municipalities (City of Vancouver) Will: Recover landfill gas from Vancouver Landfill and strive to maximize the beneficial use of the recovered gas.</p>	<p>The City of Vancouver continues to beneficially use its landfill gas.</p>

Strategy 3.3: Utilize non-recyclable material as fuel	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>3.3.1 MV Will: Direct recoverable loads of combustible material received at transfer stations to public or private energy recovery facilities.</p>	<p>Identifying and separating of individual transfer loads of high calorific value for WTEF, proved to be unfeasible, as the waste is blended during the loading process.</p>
<p>3.3.2 Municipalities (City of Vancouver) Will: Collaborate with Metro Vancouver in ensuring action 3.3.1 is carried out at solid waste management facilities operated by the City of Vancouver.</p>	<p>At present this is not feasible but will be taken into consideration in future operational designs and changes.</p>
<p>3.3.3 Other Governments and Agencies Will: Provincial Government to develop material and energy requirements for existing and future stewardship programs to use the non-recyclable portion of returned material as fuel rather than landfilling.</p>	<p>EPR programs are required to report on the 'end-fate' of collected materials (i.e., the amount of material that is reused, recycled, recovered for energy and disposed). Continuous improvement requirements leverage EPR program efforts to move up the hierarchy.</p>

Strategy 4.1: Utilize the Vancouver Landfill as a disposal site	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>4.1.1 MV Will: Use the Vancouver Landfill to dispose of any remaining waste not directed to waste-to-energy facilities.</p> <p>(a) Metro Vancouver will work with the City of Vancouver and Corporation of Delta to reduce the quantity of waste going to the Vancouver Landfill to a maximum of 100,000 tonnes annually, exclusive of waste-to-energy residuals, by 2020. Should these reductions not be achieved because overall waste flows exceed the combined capacity of disposal options, Metro Vancouver will evaluate cost effective alternatives and if appropriate seek an amendment to this Plan to expand waste-to-energy capacity to further reduce waste flows to the Vancouver Landfill.</p>	<p>Waste flow to the Vancouver Landfill has been optimized in conjunction with the other waste disposal locations with respect to system flows and finances. The Cache Creek Landfill stopped receiving waste from Metro Vancouver in July 2016. Closure of the Cache Creek Landfill was completed during the second half of 2016.</p>
<p>(b) Monitor the Vancouver Landfill to ensure compliance.</p>	<p>The City of Vancouver generates an annual landfill report that includes monitoring data, to meet OC requirements for submittal to MOE.</p>
<p>4.1.2 MV Will: Report annually on the remaining capacity of the waste management system and prior to the closure of Vancouver Landfill, reassess the region's waste-to-energy and disposal options.</p>	<p>The 2016 annual solid waste summary report includes an update on the estimated remaining disposal capacity in the region's waste management system. Future reporting will include revised estimates.</p>
<p>4.1.3 Municipalities (City of Vancouver & Delta) Will: Work with Metro Vancouver to accommodate residual waste flows at the Vancouver Landfill.</p>	<p>This is being done in accordance with actions 4.1.1(a) and (b) and facilitated through the Tri-Partite Technical Committee in accordance with the conditions set out in the Tri-Partite Agreement.</p>
<p>4.1.4 Municipalities (City of Vancouver & Delta) Will: Where limits in the Operational Certificate, contracts, agreements and regulations appear to conflict with the Plan, review the particular provisions in good faith with the Province, Metro Vancouver and any other involved party to determine if there is a solution acceptable to all affected parties.</p>	<p>No conflicts have been identified with the Plan. The Tri-Partite Agreement is to continue in its present form.</p>

Strategy 4.2: Ensure a disposal site is available for DLC waste	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>4.2.1 MV Will: Assess long-term disposal of demolition, land clearing, and construction (DLC) waste remaining after recycling in collaboration with the private sector, neighbouring regional districts and First Nations communities.</p>	<p>This is primarily covered under 2.4.3 which is Metro Vancouver’s ongoing monitoring of the regional flows and recycling and disposal capacity of DLC wastes. Metro Vancouver will also be commissioning a feasibility study in 2017 to assess the viability of a new material recovery facility for DLC wastes to reduce the volume of material going to disposal.</p> <p>See also action 1.1.8</p>
<p>4.2.2 MV Will: Identify disposal sites for DLC waste remaining after recycling that will be available when existing disposal facilities reach their capacity.</p>	<p>This is primarily covered under 2.4.3 which is Metro Vancouver’s ongoing monitoring of the regional flows and recycling and disposal capacity of DLC wastes. Metro Vancouver will also be commissioning a feasibility study in 2017 to assess the viability of a new material recovery facility for DLC wastes to reduce the volume of material going to disposal.</p>

Strategy 4.3: Establish contingency disposal sites	
ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p>4.3.1 MV Will: Ensure adequate landfill capacity for:</p> <ul style="list-style-type: none"> (a) non-combustible and non-recyclable material; and (b) municipal solid waste in excess of waste-to-energy and in-region landfill capacity (including allowances for variability in waste flows and short-term operational disruption), and non-recyclable ash. 	<p>For 2015 and 2016, system disposal capacity was adequate for the regions requirements. Projected waste flows will be assessed prior to the procurement to ensure suitable capacity is secured.</p> <p>Interim contracts for contingency disposal are in place. Procurement for a three-year contract is underway.</p>
<p>4.3.2 MV Will: If sufficient waste-to-energy or in-region landfill capacity is not available, this Plan explicitly permits Metro Vancouver to seek, through an appropriate procurement process, the best available out-of-region landfill(s) for the disposal of remaining waste, subject to that facility having appropriate permits, from the local permitting jurisdiction in which it is located, to accept such waste.</p> <ul style="list-style-type: none"> (a) Categories of evaluation for a contingency landfill will include, but not necessarily be limited to cost, air emissions, GHG emissions, energy benefit and, where appropriate, completion of a satisfactory human health impact assessment. (b) Monitor contingency disposal site(s) for performance and compliance. 	<p>Metro Vancouver continues to monitor waste flow projections and remaining disposal capacity and will take into consideration environmental, social and economic factors when determining alternative disposal sites when and if deemed necessary.</p> <p>While system disposal capacity for 2016 was adequate, a competitive procurement process to secure contingency disposal capacity was initiated in 2016 with the issuance of an RFP. However, this process was cancelled due to Proponents not willing to sign a Participation Agreement (non-compete clause). Metro Vancouver will review requirements and options for contingency disposal moving forward.</p> <p>Interim contracts for contingency disposal are in place. Procurement for a three-year contract is underway.</p>

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III. DETAILED ISWRMP PERFORMANCE MEASURES

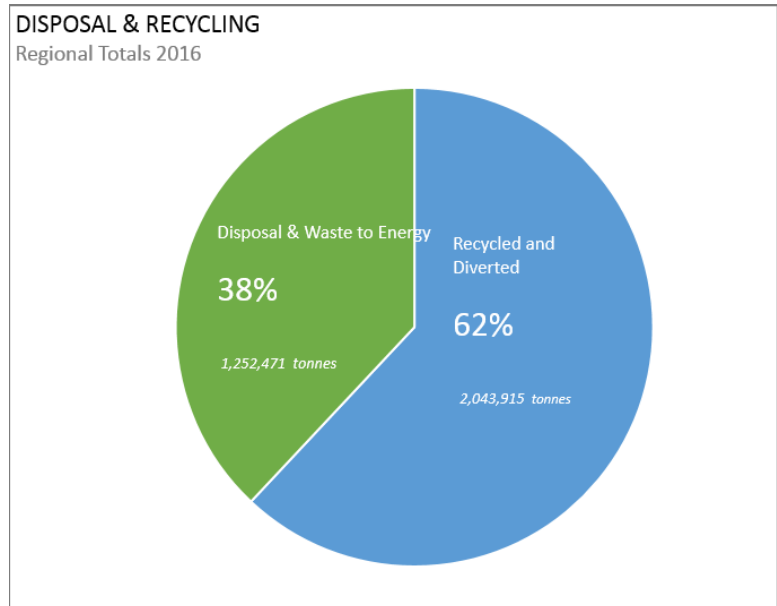
The following section reports on the official performance measures in the ISWRMP, including estimated wastes disposed and recycled for the Metro Vancouver region in calendar 2016.

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Recycling and solid waste management is categorized into three sectors: Residential; Industrial, Commercial, and Institutional (ICI); and Demolition, Land-clearing, and Construction (DLC).

In 2016, 2,043,915 tonnes of material were recycled and diverted from disposal in Metro Vancouver. This amounts to 62% of the waste material generated in the region. A remaining 1,252,471 tonnes of solid waste were disposed of.

Garbage and recycling from single family residences are collected mostly in dedicated vehicles, by municipalities; therefore, single family residential garbage and recycling percentages have a reasonably high degree of certainty.



However, garbage from multi-family residences is usually mixed with garbage from commercial, and institutional (ICI) businesses, as they are both typically collected by the private sector on the basis of efficient vehicle routing. As a result, multi-family residential garbage and recycling percentages are less certain, and should be considered approximate only. For the 2016 calendar year, the multi-family residential recycling rate was estimated to be about 35% (including EPR recyclables).

Additionally, Metro Vancouver estimates that no significant quantities of municipal solid waste from commercial generators and multi-family residential buildings were exported from the region to disposal in calendar 2016 due to the implementation of the variable rate tipping fee.

The following table presents recycling and solid waste quantities for each sector. In 2016, Metro Vancouver has estimated the distribution of EPR recycling tonnages to the single family, multi-family and commercial sectors (see note 3 in Table 1). Appendix 1 includes a similar table with a comparison to the previous year.

WASTE SECTOR	DISPOSED (tonnes)	RECYCLED (tonnes)	RECYCLING RATE ³ (%)	DISPOSED (tonnes/capita)	DISPOSED (tonnes/HH)
Residential	489,256	677,149	58%	0.19	0.51
Single Family (reported ¹) Population ⁴ = 1,511,428	273,957	558,850	67%	0.18	0.58
Multi-Family (estimated ²) Population ⁴ = 985,623	215,299	118,299	35%	0.21	0.44
Multi-Family (estimated out of region ⁵)	-				
ICI (estimated) Employees ⁴ = 1,295,752	346,935	329,620	49%	0.14	0.36
ICI (estimated out of region ⁵)	-				
DLC (reported)	416,280	1,037,146	71%	0.16	0.43
TOTAL	1,252,471	2,043,915	62%	0.49	1.31

Notes:

- 1 Reported tonnes of disposed and recycled waste are obtained from municipal reports, private recycling and processing facility records, landfill records, or product stewardship association records. This includes "Residential Drop-Off" tonnages.
- 2 Estimated tonnes of disposed waste are based on per capita multi-family disposal rates and the total transfer station weigh scale reports for 'Commercial' waste. A calculated portion of that total is then attributed to each sector. Multi-family recycling is reported by municipalities and combined with estimated 'Residential Drop-Off' tonnages.
- 3 The Total Recycling Rate includes the Product Stewardship tonnages. The recycling rates for individual Sectors also include Product Stewardship tonnages, based on estimate of the relative contributions to Product Stewardship tonnages from single family homes, multi-family homes, and businesses, with the exception of RecycleBC tonnages that are allocated 54% to the single family sector, 36% to the multi-family sector, and 10% to the IC&I sector.
- 4 Population, Employment and Housing figures are based on 2016 projections provided by Metro Vancouver's Regional Planning Department based on the most recent census data.
- 5 Out-of-region disposal estimates based on scale record analysis and FVRD tonnage reports. Split between industrial, commercial and institutional, and multi-family, based on per capita multi-family disposal estimate and population.

METRO VANCOUVER'S RECYCLING AND SOLID WASTE MANAGEMENT SYSTEM

Metro Vancouver's integrated recycling and solid waste management system provides service to the residents and businesses of 21 municipalities, one Electoral Area and one Treaty First Nation. Waste from the City of Abbotsford was received at the Matsqui Transfer Station until its closure on November 1, 2015, and waste from Thompson-Nicola Regional District, the Village of Cache Creek, and the Village of Ashcroft was delivered to the Cache Creek Landfill during 2016, but is not tabulated in the Metro Vancouver Recycling and Solid Waste Quantities.

Recycling

Municipalities historically have provided recycling services for the single family residential sector, and some parts of the multi-family residential and ICI sectors. In 2014, a private sector industry stewardship organization MMBC (now RecycleBC) assumed responsibility for recycling Packaging and Printed Papers from single family and multi-family homes, as legislated by the Province. Most ICI, and DLC recyclables are managed by the private sector (although industry stewardship program will take over for ICI businesses in the coming years). The following table presents the quantities and types of recyclables collected in 2016. In this table, "Take Back" (EPR) recyclables have been presented separately instead of allocating to residential and ICI sectors.

MATERIAL TYPE	RESIDENTIAL (tonnes)	ICI (tonnes)	DLC (tonnes)	EPR PROGRAMS (tonnes)	TOTAL (tonnes)
Asphalt	-	-	172,832	-	172,832
Batteries	-	-	-	11,338	11,338
Concrete	-	2,959	530,168	-	533,128
Electronic & Electrical Equipment	-	72	-	26,312	26,384
Fibre	36,677	113,806	35,636	143,746	329,864
Glass	9,033	5,241	-	66,086	80,360
Gypsum	947	340	48,350	-	49,637
HHW	-	-	-	21,636	21,636
Metal	17,975	18,651	30,383	19,468	86,477
Other	-	-	11,500	-	11,500
Plastic	4,583	12,698	-	15,967	33,247
Textiles	-	165	-	-	165
Tires	-	-	-	15,701	15,701
Wood	5,197	19,101	208,277	-	232,574
Yard & Food	295,962	143,110	-	-	439,071
TOTAL	370,372	316,142	1,037,146	320,254	2,043,915

Disposed Waste

Residential and ICI waste disposal is handled through the regional solid waste management system. In 2016, the Regional Facilities consisted of:

- seven transfer stations (the Matsqui Transfer Station closed on November 1, 2015)
- Vancouver Landfill
- Cache Creek Landfill (until December 31, 2016)
- Waste-to-Energy Facility in Burnaby

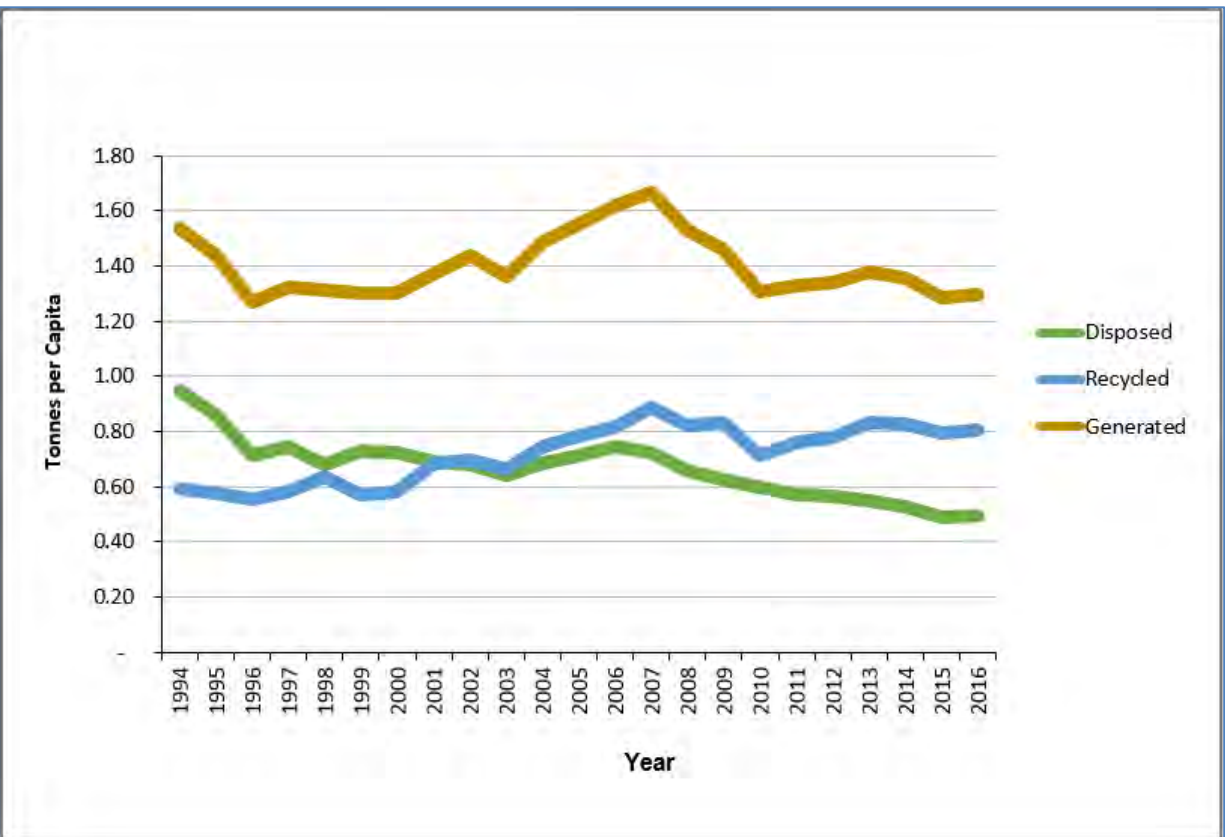
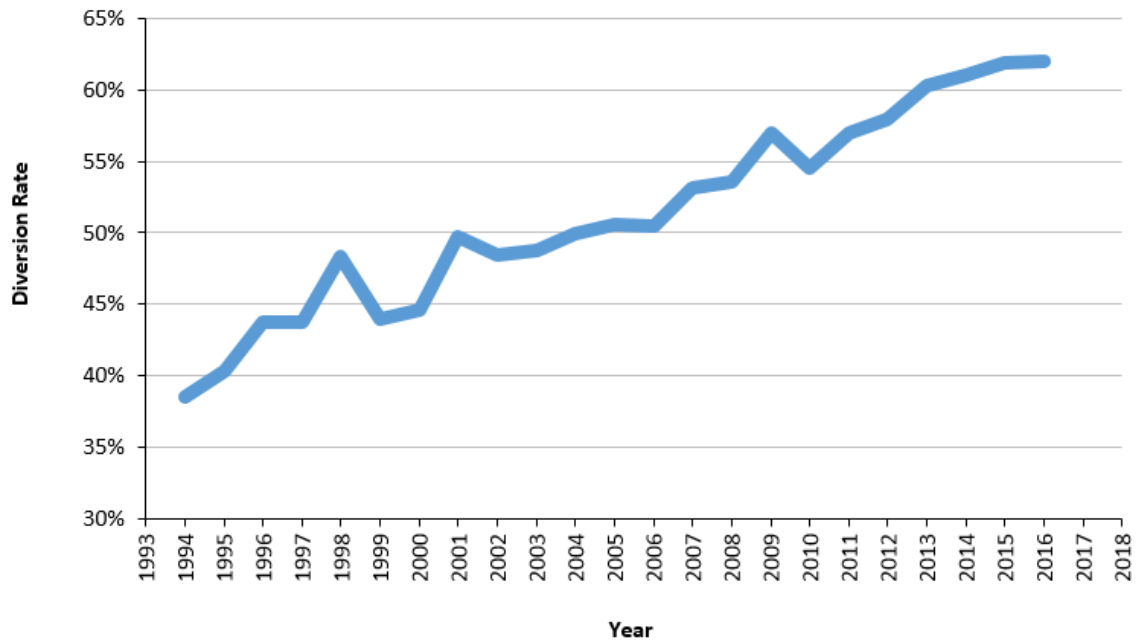
All municipal solid waste delivered to the disposal facilities (landfills and waste-to-energy) is accounted in Metro Vancouver's disposal rate (including DLC and material disposed out of region). The current per capita disposal rate in the region is 0.49 tonnes per person.

DLC waste is handled separately from the regional solid waste management system, and is disposed at a private landfill, the Vancouver Landfill or at one of several other landfills that are not under Metro Vancouver jurisdiction. In 2016, the Residential, ICI, and DLC sectors in Metro Vancouver disposed of a total 1,252,471 tonnes of waste to the regional system and private disposal facilities.

In 2016, Metro Vancouver residents, businesses and industry achieved an overall recycling or diversion rate of 62%. Figures below show the regional diversion rate from all waste sectors, and the total per capita generation, disposal and recycling rates for the region since 1994, respectively:

REGIONAL DIVERSION RATE

All Sectors
1994 to 2016



The following table shows Metro Vancouver’s regional waste and recycling figures by year:

YEAR	REGIONAL POPULATION	REGIONAL HOUSEHOLDS	TOTAL GENERATED (tonnes)	TOTAL RECYCLED (tonnes)	TOTAL DISPOSED (tonnes)	RECYCLING RATE (%)	GENERATION RATE (tonnes/capita)	DISPOSAL RATE (tonnes/capita)	DISPOSAL RATE (tonnes/HH)
1994	1,732,567		2,663,581	1,025,921	1,680,750	39%	1.54	0.97	
1995	1,784,656		2,561,858	1,032,095	1,529,763	40%	1.44	0.86	
1996	1,906,492		2,419,323	1,058,441	1,360,882	44%	1.27	0.71	
1997	1,954,523		2,589,044	1,131,958	1,457,086	44%	1.32	0.75	
1998	1,984,743		2,609,913	1,261,680	1,348,233	48%	1.31	0.68	
1999	2,013,201		2,618,538	1,151,130	1,467,408	44%	1.30	0.73	
2000	2,041,399		2,657,076	1,183,611	1,473,465	45%	1.30	0.72	
2001	2,073,662		2,851,208	1,418,489	1,432,719	50%	1.37	0.69	
2002	2,102,244		2,903,894	1,470,445	1,433,449	51%	1.38	0.68	
2003	2,128,965		2,775,455	1,414,390	1,361,065	51%	1.30	0.64	
2004	2,153,998		3,072,702	1,595,999	1,476,703	52%	1.43	0.69	
2005	2,188,573		3,245,796	1,701,414	1,544,382	52%	1.48	0.71	
2006	2,218,026	817,040	3,434,617	1,794,613	1,640,004	52%	1.55	0.74	2.01
2007	2,251,887	831,909	3,598,142	1,980,751	1,617,391	55%	1.60	0.72	1.94
2008	2,273,095	836,304	3,366,123	1,866,892	1,499,231	55%	1.48	0.66	1.79
2009	2,314,163	865,017	3,374,840	1,922,840	1,452,001	57%	1.46	0.63	1.68
2010	2,351,496	879,874	3,075,392	1,676,117	1,399,275	55%	1.31	0.60	1.59
2011	2,395,520	898,273	3,188,348	1,817,446	1,370,902	57%	1.33	0.57	1.53
2012	2,408,559	910,763	3,228,305	1,871,339	1,356,966	58%	1.34	0.56	1.49
2013	2,430,305	920,375	3,348,498	2,020,114	1,328,384	60%	1.38	0.55	1.44
2014	2,465,031	939,212	3,343,471	2,040,280	1,303,191	61%	1.36	0.53	1.39
2015	2,497,052	943,072	3,202,979	1,982,137	1,220,842	62%	1.28	0.49	1.29
2016	2,546,595	943,072	3,296,386	2,043,915	1,252,471	62%	1.29	0.49	1.33

The following table highlights the single family residential recycling and solid waste figures:

YEAR	SINGLE FAMILY RESIDENTIAL POPULATION	SINGLE FAMILY RESIDENTIAL HOUSEHOLDS	SECTOR GENERATED (tonnes)	SECTOR RECYCLED (tonnes) ¹	SECTOR DISPOSED (tonnes)	SECTOR RECYCLING RATE (%)	SECTOR GENERATION RATE (tonnes/capita)	SECTOR DISPOSAL RATE (tonnes/capita)	SECTOR DISPOSAL RATE (tonnes/HH)
2006	1,389,809	428,045	778,629	336,577	442,052	43%	0.56	0.32	1.03
2007	1,399,185	434,163	783,878	352,455	431,423	45%	0.56	0.31	0.99
2008	1,409,040	428,045	741,783	324,093	417,690	44%	0.53	0.30	0.98
2009	1,419,442	443,894	749,536	330,294	419,242	44%	0.53	0.30	0.94
2010	1,429,495	447,932	721,746	344,450	377,296	48%	0.50	0.26	0.84
2011	1,440,334	454,662	732,112	363,594	368,518	50%	0.51	0.26	0.81
2012	1,476,411	458,496	784,196	439,077	345,118	56%	0.53	0.23	0.75
2013	1,484,766	462,170	761,169	456,822	304,347	60%	0.51	0.20	0.66
2014	1,494,336	464,955	774,877	482,090	292,787	62%	0.52	0.20	0.63
2015	1,511,428	471,157	809,500	533,861	275,639	66%	0.54	0.18	0.59
2016	1,533,062	471,157	832,807	558,850	273,957	67%	0.54	0.18	0.58

1 Includes distributed EPR Recyclables from 2012 onward

The following table outlines the amount of construction and demolition waste disposed to the Vancouver landfill and to private C&D landfills since 2010:

C&D Waste Disposal by Facility (Tonnes)

Year	Vancouver Landfill	Private Facilities	Total
2010	140,734	165,331	306,065
2011	196,498	169,961	366,459
2012	185,317	173,374	358,691
2013	159,303	233,039	392,342
2014	132,721	260,951	393,672
2015	124,044	266,338	390,382
2016	118,168	232,908	351,076

The following table outlines the amount of residential and commercial waste disposed to regional disposal sites, and outside of the regional system since 2010:

Residential & Commercial Waste Disposal by Facility (Tonnes)

Year	Cache Creek Landfill	Vancouver Landfill	Waste to Energy	Out of Region (Estimated)
2010	396,384	427,083	284,458	
2011	280,249	456,229	281,139	
2012	242,902	469,273	281,260	50,000
2013	217,072	395,253	280,138	60,000
2014	207,191	355,594	275,260	100,000
2015	206,198	366,123	256,402	30,000
2016	134,866	518,324	254,256	

The following table outlines the amount of wastes of different types (municipal solid wastes, construction & demolition wastes, wastewater treatment plant residuals, water treatment residuals, bottom ash from the waste-to-energy facility, and industrial waste (e.g. pulp and paper wastes) from Norampac disposed at the Vancouver landfill since 2010:

Vancouver Landfill Waste Tonnages (tonnes)

Year	MSW	C&D	WWTP Residuals	WT Residuals	Bottom Ash	Norampac	Total
2010	427,083	140,734	6,545	6,037	46,410		580,399
2011	456,229	196,498	5,775	6,542	46,027		665,044
2012	469,273	185,317	6,050	7,295	44,925	48,347	716,282
2013	395,253	159,303	7,346	6,731	32,538		601,171
2014	355,594	132,721	7,377	7,595	44,861	599	548,747
2015	366,123	124,044	7,312	9,280	43,413		550,172
2016	518,324	118,168	8,028	3,944	43,068		691,532

The following table outlines the amount of fly ash disposed from the waste-to-energy facility since 2010:

Fly Ash Disposal (Out of Region) (tonnes)

2010	12,265*
2011	11,964*
2012	11,841**
2013	11,710
2014	10,720
2015	9,657
2016	10,268

* Cache Creek Landfill

** 8,923 to Cache Creek, 2,918 to Alberta

Goal	Progress Measure	Progress Detail										
		2010	2011	2012	2013	2014	2015	2016	Average / Change 2010-2016			
GOAL 1 Minimize waste generation	Waste generation measures	Waste generated by sector (tonnes)										
	Waste generation quantities for all sectors tracked year-over-year and on a rolling five-year basis	Residential (Single and Multi-Family)	962,953	973,394	1,077,776	1,061,571	1,070,600	1,083,638	1,166,405	1,056,620		
		ICI (Institutional), Commercial and Light Industrial)	818,789	676,021	709,131	677,458	690,789	626,104	676,555	696,407		
		DLC (Demolition, Land-clearing and Construction)	1,104,794	1,409,987	1,441,399	1,609,469	1,582,082	1,493,236	1,453,426	1,442,056		
		<i>Total generated</i>	<i>3,075,392</i>	<i>3,188,348</i>	<i>3,228,305</i>	<i>3,348,498</i>	<i>3,343,471</i>	<i>3,202,979</i>	<i>3,296,386</i>	<i>3,240,483</i>		
		<i>Total generated per capita</i>	<i>1.31</i>	<i>1.33</i>	<i>1.34</i>	<i>1.38</i>	<i>1.36</i>	<i>1.28</i>	<i>1.29</i>	<i>1.33</i>		
	Increase of product stewardship initiatives by senior governments to more than two initiatives every three years	New product stewardship initiatives by year	2	3	3	0	1	2	0	11		
		Waste diverted through EPR programs (tonnes)	130,384	128,946	124,048	128,224	205,094	245,078	320,254	146%		
	Monitor performance of EPR programs to ensure shift in responsibility from public to private sector achieves a reduction in total waste generated	Est. EPR materials disposed in waste stream ^(H) (tonnes)	27,500	28,900	28,800	25,700	109,100	99,700	100,300	265%		
		Est. EPR materials generated (tonnes)	157,900	157,800	152,800	153,900	314,200	344,800	420,600	166%		
% EPR materials generated diverted		83%	82%	81%	83%	65%	71%	76%	-6%			
GOAL 2 Maximize reuse, recycling, and material recovery	Diversion measures	Overall diversion rate tracked year-over-year										
	Overall diversion rate tracked year-over-year	55%	57%	58%	60%	61%	62%	62%	7%			
	Disposal rate per capita tracked year-over-year (MSW + DLC)	0.60	0.57	0.56	0.55	0.53	0.49	0.49	-18%			
	Diversion rate per-capita tracked year-over-year	0.71	0.76	0.73	0.83	0.83	0.79	0.80	13%			
	Tracking of material recycling tonnage	1,676,117	1,817,446	1,871,339	2,020,114	2,040,280	1,982,137	2,043,915	22%			
	Monitor performance of EPR programs to ensure shift in responsibility from public to private sector achieves an increase in material reused, recycled, and recovered	Material captured through EPR programs (tonnes)	130,384	128,946	124,048	128,224	205,094	245,078	320,254	146%		

	2010	2011	2012	2013	2014	2015	2016	Change 2010-2016
Energy measures								
Total material sent to waste-to-energy facility (Tonnes)								
MV-WTEF (tonnes waste disposed)	284,458	281,139	281,260	280,138	275,260	254,381	254,256	n/a
Energy Purchased (GigaJoules)								
MV-WTEF (BC Hydro Electricity)	73,751	72,951	74,526	78,017	77,524	77,500	79,160	7%
MV-WTEF (Fortis Natural Gas)	20,103	13,375	16,306	12,544	11,317	19,729	16,088	-20%
Energy Produced and Delivered to End Users (GigaJoules)								
MV-WTEF (Electricity)	505,198	500,881	600,292	637,885	537,110	558,731	624,053	24%
MV-WTEF (Steam to Norampac)	685,054	623,798	-	-	-	-	-	-100%
Cache Creek LF (LFG)	-	-	-	-	-	75,686	113,530	n/a
Coquitlam LF (LFG to Catalyst)	16,452	11,597	-	-	-	-	-	-100%
Vancouver LF (LFG to Maxim/VF Clean Energy) ⁽⁴⁾	629,820	587,712	389,430	584,302	749,353	647,348	522,732	-17%
Total	1,836,524	1,723,988	989,722	1,222,187	1,286,463	1,281,765	1,260,315	-31%
Energy Produced but Not Used (GigaJoules)								
MV-WTEF (low grade heat loss)	Future district heating systems may make use of unused low grade heat.							
Cache Creek LF (LFG flared)	212,823	349,635	386,100	450,684	512,655	352,714	595,100	180%
Coquitlam LF (LFG flared)	0	5,564	16,187	16,200	14,248	15,728	14,548	n/a
Vancouver LF (LFG flared)	254,757	148,890	622,661	507,535	456,064	554,763	729,902	187%
Total	467,580	504,089	1,024,947	974,417	982,967	923,205	1,339,550	186%
Carbon Dioxide equivalents emitted and avoided (t CO2E)								
MV-WTEF - Emitted ⁽⁵⁾	119,790	118,069	120,766	115,120	108,708	112,060	118,272	-1%
MV-WTEF (Electricity) ⁽²⁾	(3,508)	(3,478)	(4,189)	(3,333)	(1,488)	(1,552)	(1,850)	-47%
MV-WTEF (Heat from Steam) ⁽¹⁾	(45,146)	(41,109)	-	-	-	-	-	n/a/
MV-WTEF - Net	71,136	73,482	116,597	111,788	107,221	110,508	116,422	64%
Cache Creek LF - Emitted ⁽⁴⁾	137,899	107,292	95,867	65,674	45,749	54,625	75,625	-45%
Cache Creek LF (Avoided)	-	-	-	-	-	(76)	(130)	n/a
Cache Creek LF - Net	137,899	107,292	95,867	65,674	45,749	54,549	75,495	-45%
Coquitlam LF - Emitted ⁽⁴⁾	16,987	15,852	10,072	7,297	6,751	5,627	5,184	-69%
Coquitlam LF (LFG to Boilers) ⁽¹⁾	(813)	(573)	-	-	-	-	-	n/a
Coquitlam LF - Net	16,154	15,279	10,072	7,297	6,751	5,627	5,184	-68%
Vancouver LF - Emitted ⁽⁴⁾	510,472	580,543	472,382	404,259	383,348	209,100	184,000	-64%
Vancouver LF (LFG to Maxim/VF Clean Energy) ⁽¹⁾	(31,151)	(29,068)	(19,261)	(26,900)	(37,063)	(32,044)	(25,875)	-17%
Vancouver LF - Net	479,321	551,474	453,121	377,359	346,285	177,056	158,125	-67%
Total Emitted	785,119	821,756	698,887	592,350	544,556	381,412	383,081	-51%
Total Avoided	(80,619)	(74,229)	(23,430)	(31,232)	(30,551)	(33,672)	(27,855)	-65%
Total Net Emissions	704,510	747,527	675,457	561,118	506,006	347,740	355,226	-50%
Disposal measures								
Quantity of treated and untreated waste per capita going to landfill is tracked year-over-year	0.33	0.30	0.30	0.26	0.25	0.25	0.20	-40%
Metro Vancouver will carry out periodic waste composition audits	Yes	Yes	Yes	Yes	Yes	Yes	Yes	n/a
GOAL 3								
Recover energy from the waste stream after material recycling	Future district heating systems may make use of unused low grade heat.							
GOAL 4								
Dispose of all remaining waste in landfill, after material recycling and energy recovery	Metro Vancouver will carry out periodic waste composition audits							

Notes:

- (1) Based on Metro Vancouver Waste Composition monitoring of products in EPR programs at the end of the particular year. 2014 includes packaging and printed paper as EPR products.
- (2) Emission reduction calculated based on avoided hydro electricity generation
- (3) Emission reduction calculated based on avoided natural gas use.
- (4) LFG emissions based on publically reported numbers, and account for the current methane Global Warming Potential (GWP) of 25, and a flare destruction efficiency of 98%. Methane oxidation in the landfill cover is not included.
- (5) WTEF emissions for 2012 and subsequent years have been calculated using an improved methodology based on a continuous emissions monitoring system (CEMS) and stack test data; emissions from 2010-2011 have been backcast to align with new method.
- (6) Emission reduction calculated based on avoided hydro electricity generation and heat supplied to nearby greenhouses. It was assumed that the proportion of electricity generation and supplied heat remained same over the years.

Acknowledgements

Metro Vancouver thanks its member municipalities, EPR Product Stewardship Associations, and the many private recycling and processing facilities for contributing the data used to complete this report.

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IV. MINISTERIAL CONDITIONS

As this document also represents the 5 year report, the following section reports on the Ministerial Conditions for approval of the ISWRMP.

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Ministerial Condition	Current Status
<p>1. MV must ensure that any new facility and/or modification to an existing facility managing municipal waste follow a process for authorizing a facility in the SWMP. This process shall include:</p> <ul style="list-style-type: none"> a. Appropriate consultation with the Ministry of Environment; b. All new facilities may be required to have a license issued in accordance with the Greater Vancouver Sewerage and Drainage District's Municipal Solid Waste and Recyclable Material Regulatory Bylaw No. 181, 1996 as amended by Bylaw No. 183, 1996, and any subsequent amendments; c. The Ministry of Environment, at the discretion of the Director, may commence the process to issue an operational certificate for a facility, upon authorization under the SWMP; and d. If a facility's only purpose is managing municipal solid waste and/or recyclable materials under a provincial Stewardship Program and/or is already fully governed by a specific provincial regulation or Code of Practice for that industry, it shall be considered authorized by the SWMP. 	<ul style="list-style-type: none"> a. Implementation of all new facilities or major modifications to regional waste facilities are done with appropriate communication and consultation with the Ministry of Environment. b. This is done for any facilities requiring licensing under GVS&DD bylaws. c. Noted. d. Noted.
<p>2. Metro Vancouver must ensure, to the satisfaction of the Director, that the competitive process for establishing any new or upgrading any existing waste-to-energy (W2E) capacity and/or establishing contingency landfill as identified in the SWMP for up to 500,000 tonnes of additional disposal capacity considers the full range of possible options both in and out of region in an equal and fair manner. Furthermore, Metro Vancouver must provide a consultation plan on the selected option(s).</p>	<p>The procurement process for New WTE has been discontinued. However, if that should change in future, Metro Vancouver will ensure this condition is met.</p> <p>Metro Vancouver is procuring contingency disposal through a competitive process, and submitted a consultation plan to the Ministry of Environment.</p>

<p>3. Recognizing that the Fraser Valley Regional District (FVRD) and Metro Vancouver share a common and critically important air shed, if Metro Vancouver pursues establishing additional in-region W2E capacity, it shall consult with the FVRD to address air quality concerns prior to beginning construction of a new or expanded facility. As a minimum, Metro Vancouver must establish a working group with the FVRD on the potential impact to the air shed due to additional W2E capacity. The working group may include the local health authority(s) and must, within one year of any Metro Vancouver decision to pursue in-region W2E:</p> <ul style="list-style-type: none"> a. Develop recommendations for W2E emission standards that do not conflict with Provincial or Federal policy and/or legislation; b. Develop recommendations for an environmental monitoring program for any new or expanded in-region W2E facility(s); c. Establish mitigation measures that address reasonable concerns of the FVRD with respect to additional W2E in-region; d. Include any other reasonable related issues agreed to by the parties; e. If the parties are unable to reach consensus within the timeframe, they will submit their respective positions to an arbitrator who will render a recommendation and report to the Director for consideration in any concurrent or subsequent regulatory process; f. Be supported and resourced by Metro Vancouver; and g. Provide quarterly updates to the Regional Manager, Environmental Protection. 	<p>The procurement process for New WTE has been discontinued. However, if that should change in future, Metro Vancouver will ensure this condition is met.</p>
<p>4. Metro Vancouver's Burnaby W2E facility will operate under the conditions set forth in Appendix A until December 31, 2013, at which time, the Director may issue an operational certificate pursuant to section 28 of the <i>Environmental Management Act</i>.</p>	<p>The Ministry of Environment issued an Operational Certificate for the Waste-to-Energy Facility on December 15, 2016.</p>

<p>5. Metro Vancouver shall consult with the Ministry of Environment, member municipalities and all other applicable parties in identifying active and closed municipal landfills located within the regional district. Metro Vancouver and its member municipalities shall:</p> <p>a. Generate, by December 31, 2012, a list of all known municipal and regional landfills within the region and submit it in the subsequent SWMP biennial report;</p> <p>b. Determine the closure status for all landfills identified in (a) above by December 31, 2013;</p>	<p>[ACTION COMPLETED]</p> <ul style="list-style-type: none"> Letter sent to MOE on January 7, 2013 which included a list of the 27 known municipal and regional landfill sites within the region. <p>[ACTION COMPLETED]</p> <p>Letter sent to MOE on March 14, 2014 which included the 2014 report, “Landfill Inventory and Closure Status Assessment Study” completed by Morrison Hershfield.</p> <ul style="list-style-type: none"> The report included the methodology and closure assessment strategy and criteria for determining closure status of the 27 landfill sites identified in the January 7, 2013 letter sent to MOE. Three sites were removed from further assessment based on information obtained during the study due to first site being referred by two separate names, the second site being located on private land and the third site located on federal land (first nation). Of the remaining 24 landfill sites, 14 sites were screened from further assessment because they were deemed to have an approved closure plan in place or in progress. The closure status of the 10 remaining sites were determined by a qualified professional that developed the following two sets of criteria: <ul style="list-style-type: none"> A. Regulatory requirements and relevant Provincial Landfill guidelines <ul style="list-style-type: none"> a. Assessed compliance with relevant Permits and Operational Certificates b. Assessed closure status against relevant Provincial guidelines: <ul style="list-style-type: none"> i. For sites that closed prior to 1993 (when the BC Landfill Criteria for Municipal Solid Waste came into effect), the Operational Guidelines for the Discharge of Refuse on Land (BC MOE, 1971) were used; ii. For sites that were active or closed after 1993, the BC Landfill Criteria were used.
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<p>c. Ensure closure plans are in place by December 31, 2016, for all landfills identified in (a) above with appropriate Ministry authorizations; and</p> <p>d. Submit, in the 2017 biennial report, a status summary.</p>	<p>B. Best practices for landfill closure status against best practices requirements for protection of the environment and human health.</p> <ul style="list-style-type: none"> • Of the ten sites, eight sites satisfied the above criteria which is considered equivalent to an MOE approved closure plan. • The two remaining sites required further work and the host municipality retained a consultant to close the information gaps and prepare a long-term care plan in order to satisfy the criteria. <p>[ACTION COMPLETED]</p> <ul style="list-style-type: none"> • The 2014 “Landfill Inventory and Closure Status Assessment Study” by Morrison Hershfield reviewed 27 landfill sites that were originally identified and determined that only two landfill sites required further work in order to be considered equivalent to an MOE approved closure plan. • Since 2014, the municipality where the two landfill sites requiring further work are located retained consultants to complete a gap analysis and provide recommendations for a five year monitoring plan plus remedial work. The municipality is in the process of retaining a consultant to carry out these recommendations. • Therefore, the ministerial condition to ensure closure plans are in place for all landfills has been met by each landfill site having either: <ul style="list-style-type: none"> ○ an approved closure plan in place, or in progress; or ○ satisfied the criteria developed by the qualified professional which is considered equivalent to an MOE approved closure plan. <p>[ACTION COMPLETED]</p> <ul style="list-style-type: none"> • As noted above, letters have been sent to MOE that address this ministerial condition, which is supplemented by the above responses and submitted as the status summary.
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<p>6. Metro Vancouver shall ensure that methane gas from solid waste management facilities, as identified in Strategy 3.2, can be used as an alternative fuel in addition to the provision for generating clean electricity or heat. Processed clean-burning methane may be an alternative for vehicle fuel.</p>	<p>For the 3 landfills within our regional system:</p> <ul style="list-style-type: none"> • Cache Creek Landfill (waste delivered to Cache Creek until July 15, 2016) is generating electricity. • Vancouver Landfill is using landfill gas for co-generation of electricity and heat (offsetting natural gas). • Coquitlam Landfill’s gas utilization assessment concluded that utilization was not feasible due to low quantity of gas.
<p>7. Any role or function that Metro Vancouver, member municipalities and/or any other party contracted by either the municipality or regional district may offer or deliver for products that are managed within an approved industry product stewardship plan under the Recycling Regulation will be undertaken on a voluntary and independently agreed basis between said parties.</p>	<p>Functions between local governments and stewardship organizations have always been done on a mutually agreed basis.</p>
<p>8. Metro Vancouver shall establish a Plan Implementation Dispute Resolution Procedure in accordance with Section 32 of the Guidelines. The Procedure shall be submitted within three months from the date of this letter to the Regional Manager.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver submitted its Plan Dispute Resolution Procedure to the Ministry in September of 2016.</p>
<p>9. Metro Vancouver must establish a Plan Monitoring Advisory Committee, or a suitable alternative, to facilitate ongoing public involvement during the implementation of the new SWMP in accordance with Section 35 of the “Guide to the Preparation of Regional Solid Waste Management Plans by Regional Districts,” and provide Terms of Reference for this Committee, or alternative, to the Regional Manager within 60 days of approval of the SWMP.</p>	<p>[ACTION COMPLETED]</p> <p>See Action 2.11.1</p>
<p>10. Metro Vancouver shall submit, to the satisfaction of the Regional Manager, the following reports:</p> <ol style="list-style-type: none"> a. An SWMP progress report by September 30 of every second year that includes details of Municipal Solid Waste disposed as per Subsection 36 (1) of the Guidelines. The first report must be submitted by September 30, 2013; 	<p>Metro Vancouver has provided biennial reports on Plan implementation in 2013, 2015, and 2017.</p> <p>These reports have included the status of implementation of Plan actions as well as review of the Plan’s performance measures.</p>

<p>b. The SWMP performance review by September 30, 2016; and</p> <p>c. A full SWMP review by September 30, 2021.</p>	
<p>11. Metro Vancouver must include in the five-year performance review report an annual summary of the recovery and/or disposal solution for the nominal 30 percent residuals identified in the SWMP. This summary must include:</p> <ul style="list-style-type: none"> a. Annual actual percentage relative to the performance of the SWMP; b. Name and location of each facility receiving the nominal 30 percent residuals, whether for recovery and/or residual disposal; c. Annual quantity (in tonnes) sent to each facility; d. Annual quantity, if greater than 1,000 tonnes, of any consequential residuals from any facility in (c) above (e.g. ash) recycled and/or sent for disposal; e. Name and location of any facility receiving consequential residuals as per (d) above; and f. Records of non-compliance to Ministry legislation or other appropriate legislation in the jurisdiction for any facility identified above. 	<p>This report includes details of Plan performance measures, annual quantities of disposed waste and recycled materials.</p> <p>These regional facilities are in significant compliance with applicable Ministerial requirements. Any other issues have been addressed with the Ministry as they occurred.</p> <ul style="list-style-type: none"> • Cache Creek Landfill (Cache Creek): 128,563 Tonnes • Waste to Energy Facility (Burnaby): 254,256 Tonnes • Vancouver Landfill (Delta): 691,532 Tonnes (includes bottom ash and some DLC wastes) • Out of region disposal: ~70,000 Tonnes (this is an estimate only, as Metro Vancouver currently has no ability to control the export of waste out of the region by private sector haulers).