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**CONSTRUCTION & DEMOLITION MATERIALS**
**Introduction**

The first two technical memos discussed by the Public and Technical Advisory Committee (PTAC) in January and February examined options for reducing, reusing and recycling the municipal solid waste stream generated by residents and businesses in the Capital Regional District. This memo differs slightly from the previous memos in that it addresses all of the first three Rs for another distinct material stream, namely construction and demolition materials (C&D materials). Recovery and residuals management of C&D materials will be discussed together with recovery and residuals management options for municipal solid waste, during the relevant phases of the project (see Figure 1 for a reminder of the overall process).

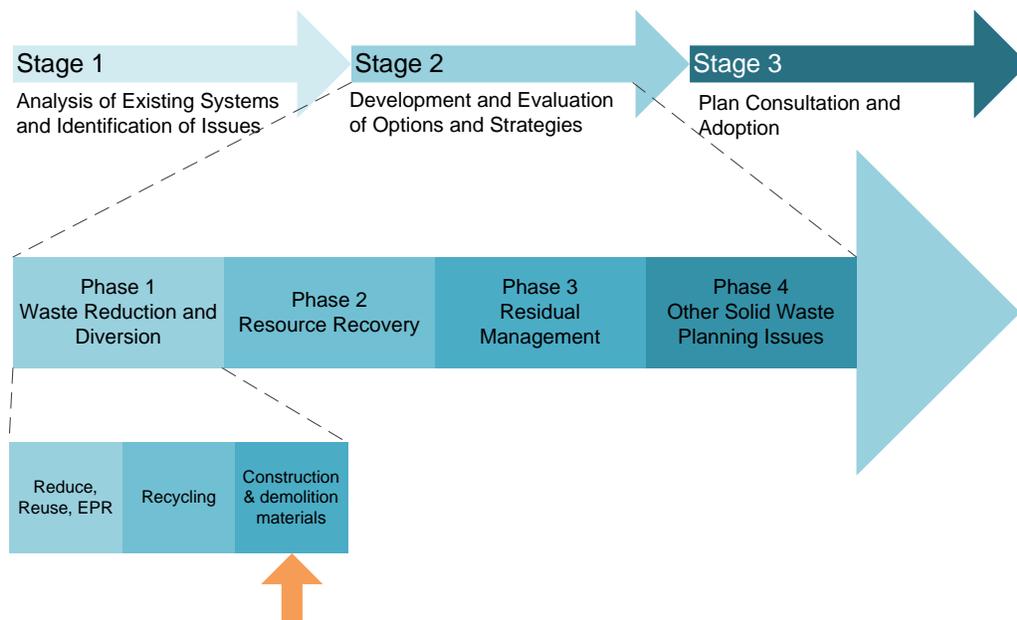


Figure 1: Where we are in the process



The structure of this memo is based on the first three Rs, with additional sections on extended producer responsibility and general policies. For each section, we present background information from the Stage 1 report, issues and challenges from the Issues Memo, and a range of options for consideration.

The information and options below are for consideration at the March 28, 2013 meeting of the PTAC. This memo is intended to stimulate discussion both at the meeting and online (before and after the meeting). At the meeting, we will have a presentation of the memo content, followed by small group sessions that focus on each of the groups of options. At the meeting, the PTAC will be asked to review the information presented in this memo, and to provide input on the general direction and options.

## 1.0 CURRENT SITUATION

C&D materials are generated by a number of activities in the region, including the construction, renovation and demolition of single family homes and other buildings, and the construction and maintenance of roads and civil works. C&D materials include concrete, gypsum wallboard (drywall), wood, asphalt roofing, composite materials (e.g. countertops, cabinets), carpet & underlay, fill materials (rock/sand/dirt), and a range of other materials commonly found in buildings, such as vinyl flooring and tiles. Some jurisdictions include paving concrete and asphalt as well, but these materials have been excluded from this analysis since reuse and recycling is standard industry practice.

Another type of materials that is often included in the C&D category is *land clearing waste*, which differs from C&D materials in terms of its composition and management options. This memo will also consider land clearing waste, but will consider it separately from the rest of C&D material stream.

The private sector (including companies such as Alpine Disposal and Recycling, Schnitzer Steel and Ellice Recycle) plays a major role in the reuse and recycling of C&D materials. It is also believed that some C&D materials are sent out of region. However, a complete record of the types and quantities recycled by the private sector is not available. The CRD receives some C&D materials at Hartland Landfill and recycles a portion of those. In 2011, approximately 2,700 tonnes of C&D materials were recycled at Hartland Landfill. This includes asphalt shingles, drywall, and wood waste.

In total, about 33,000 tonnes of C&D materials are disposed of in the Capital Region each year. C&D materials are disposed of at both the Hartland Landfill and the privately owned Tervita-Highwest landfill. About 16% of the waste disposed at Hartland Landfill is categorized as C&D materials (10% is wood waste and 6% is a variety of C&D materials). This is equivalent to about 21,000 tonnes. The Tervita-Highwest landfill is licensed to accept up to 22,500 tonnes per year of non-putrescible waste. It is estimated that the facility receives about half of that amount.

The following figure and table presents typical types of C&D materials, proportions of each type landfilled at Hartland Landfill, and typical end uses. Note that some of the end uses have changed since the time of the last waste composition study, and some new programs have been introduced that will significantly reduce the amount of certain materials landfilled (e.g. a new asphalt shingles recycling program).

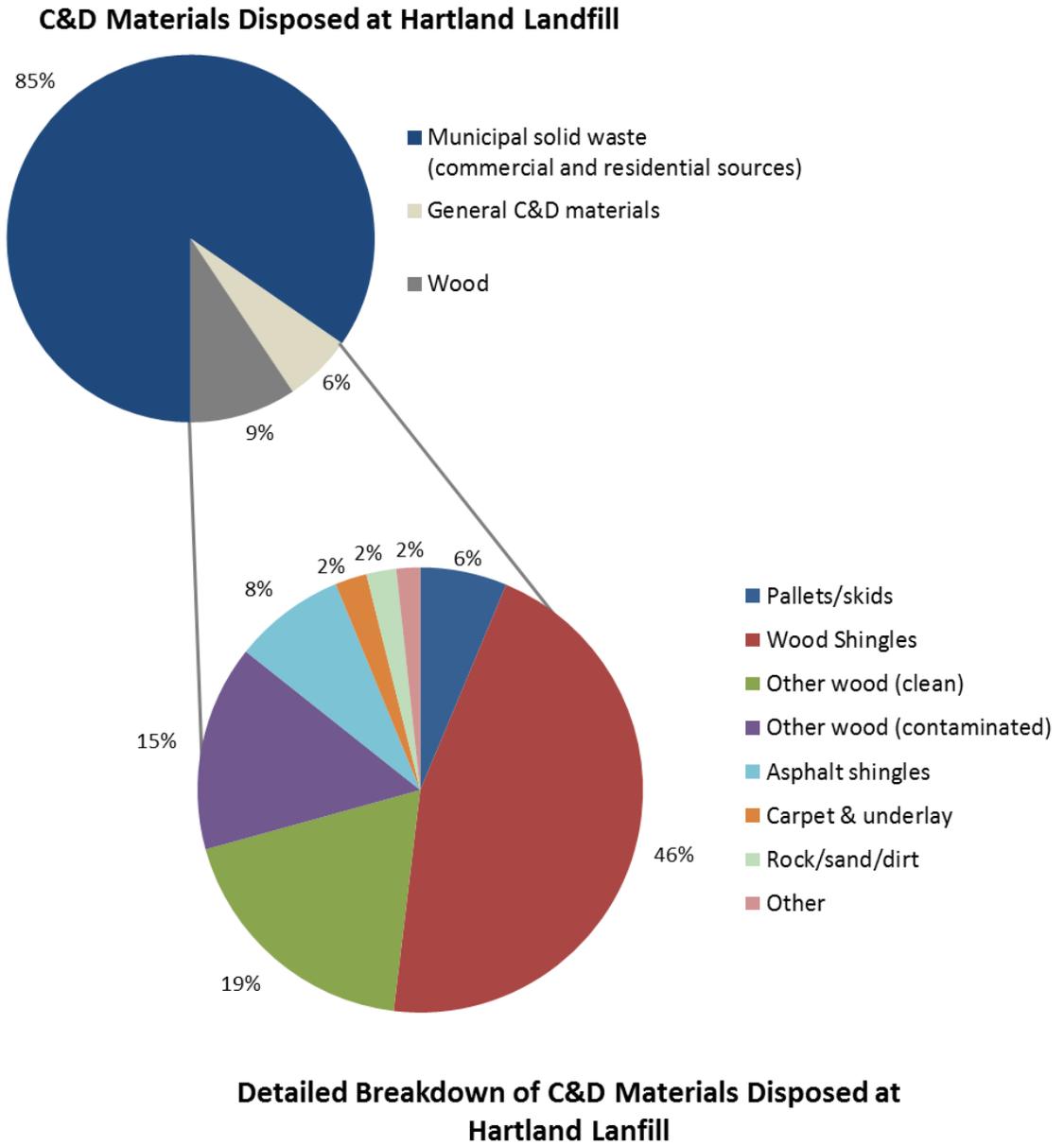


Figure 2: C&D Materials Disposed at Hartland Landfill

**Table 1: C&D and Land Clearing Waste in the CRD**

Type	Recyclable	End Uses in the CRD	% of C&D Materials Disposed at Hartland Landfill
Concrete	Yes	Crushed, used for fill	No significant amount landfilled
Gypsum wallboard (drywall)	Yes	Shipped to recycling facilities in lower mainland (eventually combined with virgin rock or synthetic gypsum to make new wallboard)	No significant amount landfilled; banned from disposal at Hartland Landfill
Clean wood (including wood shingles and pallets)	Yes	Wood chips (mulch, compost amendment) Hog fuel Landfill	71% (voluntary program in place to reduce quantity)
Contaminated/treated wood	No	Landfill; may also be used as a fuel source depending on type of contamination/treatment	15%
Asphalt roofing	Yes	Shipped to recycling facilities in lower mainland (eventually recycled into new asphalt paving (cold patch), or used as fuel)	8% (new voluntary program in place expected to reduce quantity)
Asbestos contaminated drywall	No	Secure disposal at landfill	No significant amount landfilled
Composite materials (e.g. countertops, cabinets)	No	Landfill	No significant amount landfilled
Carpet & underlay	No	Landfill	2%
Rock/sand/dirt	Yes	Clean fill	2%
Other (e.g. vinyl flooring, tiles)	No	Landfill	2%

Land clearing waste consists of trees and stumps removed when land is cleared for development. The large and bulky nature of this material makes it difficult to manage at municipal solid waste landfills and composting facilities. In most areas of the Capital Region, open burning of land clearing waste is prohibited. In these areas, land clearing debris is often ground on site using a mobile grinder and left on the property, or the land clearing waste is transported to a facility for storage and subsequent grinding. There are no permitted burn sites for land clearing waste in the Capital Region. Some residential-scale loads of land clearing waste are received at Hartland Landfill. If this material is less than 3" in diameter, it is categorized as yard waste and is subject to the yard waste disposal ban. The 2009/2010 waste composition study found that all yard waste makes up about 3% of the waste landfilled.

Since land clearing waste is typically handled on site and very little enters the publicly-managed waste management system, complete data not is available on the quantity of land clearing waste generated in the region. Some of the material received by the Tervita-Highwest Landfill may include land clearing waste.

## 1.1 Issues

The Issues Memo written in Stage 1 identified a number of challenges related to C&D materials. Since that time, additional issues have emerged. The following is a summary of all issues related to C&D materials.

- **Diversion of Shingles from Landfill.** Wood and asphalt shingles make up a significant portion of the C&D materials disposed at Hartland Landfill. However, there are recycling facilities for these products. The challenge is how to most effectively encourage the diversion of old shingles to recycling facilities.
- **Lack of Clarity on Future EPR.** C&D materials are anticipated to be covered BC's Recycling Regulation in 2017, making them part of an EPR program. However, the details of the program have not yet been developed, making it difficult to know what to plan for.
- **WorkSafe Asbestos Reporting Requirements** (not in issues memo). This is an emerging issue. In January 2011 WorkSafeBC required New West Gypsum (the local drywall recycling facility) to implement an asbestos exposure control plan (ECP) by the middle of the year. The CRD developed an ECP for the small (residential) quantities of drywall that were accepted at Hartland. Older drywall was kept isolated and tested for asbestos. If it tested positive, it would be disposed of as controlled waste. While these steps reduced exposure to asbestos, WorkSafeBC said these efforts do not fully control the dispersal of airborne drywall dust and requested additional steps be taken. This is difficult to do, because drywall won't be accepted by recyclers if it is bagged or wrapped. Therefore, the decision was made to stop accepting residential quantities of drywall at Hartland landfill beginning 04 September 2012. Residents are now redirected to private recycling facilities.
- **Uncertain Outlook for Wood Waste Market.** Historically, the main market for wood waste has been as a fuel source for pulp mills and greenhouses. The long term viability of these markets is unknown and is likely to become an issue if there are future pulp mill closures on the island. Alternative markets may need to be identified, and they may have different restrictions regarding acceptable levels of contamination.
- **Lack of Data Regarding C&D Materials.** As mentioned above, the majority of C&D material management (recycling and disposal) is conducted by the private sector. This means that the overall quantity of C&D materials recycled and disposed in the CRD is unknown, making it challenging to effectively plan.
- **Unknown Existing Quantities of Wood Waste.** An issue that arises from the previous two issues is that if the wood waste market collapses, an unknown quantity of wood waste could be destined to local landfills.
- **Potential Impacts of a Wood Waste Disposal Ban (not in issues memo).** In 2009, the CRD proposed banning the disposal of clean wood waste at Hartland landfill. A voluntary program was established in 2006 in the residential drop off area to allow customers to sort their clean wood waste. About 1400 tonnes are diverted through this voluntary program. The idea of a disposal ban received general support during a consultation process in 2009, but some challenges associated with implementation were anticipated:
  - A clear definition of clean wood waste would be required (e.g. would treated or engineered wood and particle board, mixed wood and sawdust be included?);

- Contaminant tolerance levels would need to be defined;
- Enforcement mechanisms would need to be designed and used effectively;
- Concerns were raised about increased illegal dumping (with an associated need for compensation to municipalities for clean-up), disposal at unauthorized sites on First Nations lands, and the potential for increased outdoor burning;
- Concerns were also raised about the end use of certain wood products (e.g. treated wood being chipped and used on chip wood trails, which could result in the treatment chemicals leaching into parks); and
- It was also noted that if all clean wood waste were diverted from disposal, the loss in tipping fee revenue to the CRD would not be insignificant.

## 2.0 OPTIONS

### 2.1 Reuse

It is important to make a distinction between reuse and recycling of C&D materials. Reuse refers to finding new ways to use materials in their current form. For example, cabinets or wood flooring can be removed from one house and installed in another without having to be substantively changed. Recycling refers to processing or changing materials to make them suitable for another purpose. For example, chipping clean wood waste for use on park trails.

33,000 tonnes of material arrives at Hartland Landfill and the Tervita-Highwest landfill each year. By the time that material arrives at the landfills, much of it may no longer be reusable, because of the way it was removed from the building or the way it was loaded into the vehicle. The CRD's goal therefore is to encourage practices that maximize the amount of material that can be reused from each job site.

- Continue to support non-profit organizations who engage in the reuse of building materials. This may include initiatives such as offering tipping fee rebates on remainders/unsellable goods, similar to the CRD's practice with not-for-profit agencies that reuse clothing and household goods.
- Educate and inform residents and contractors about the benefits of deconstruction rather than demolition.
- Play a coordinating role in the establishment of a building material reuse centre such as Urban Ore (<http://urbanore.com/>) or the RE-Stores in Bellingham and Seattle (<http://www.re-store.org>). Act as the facilitator, bringing together the possible players such as municipalities, existing C&D material recycling companies, and waste haulers to identify barriers to the establishment of this kind of facility, and then work towards overcoming those barriers.
- Investigate how else the CRD can facilitate an increase in professional salvage operators recovering materials (e.g., scrap metal, wood).

## 2.2 EPR

The Canada-wide Action Plan for Extended Producer Responsibility ([http://www.ccme.ca/assets/pdf/epr\\_cap.pdf](http://www.ccme.ca/assets/pdf/epr_cap.pdf)) includes construction and demolition materials, furniture, carpets and appliances in Phase 2 of EPR implementation.

BC's Ministry of Environment's Service Plan commits the province to following the Canada-wide Action Plan. This means that BC has committed to working towards operational EPR programs for those materials by 2017. However, no details have been established regarding how EPR for C&D materials will be implemented, and it is not anticipated that planning for C&D material EPR programs will occur until after the upcoming election.

Based on other EPR programs in place in BC, it is likely that EPR for C&D materials will be implemented using a hybrid model, in which both local governments and producers play a role in delivering the service. Using BC's existing framework for EPR, we can expect that product management costs will be borne by producers and consumers, not local governments or the general taxpayer. This means that a fee will be charged on construction materials to fund the collection, processing and recycling of end of life products.

BC's Recycling Regulation requires a 75% recovery rate. As the quantity of C&D materials currently recycled by the private sector is not known, it is difficult to predict if the implementation of EPR for C&D materials will result in a dramatic increase in recycling. However, the Recycling Regulation also requires continuous improvement, so if the quantity of C&D materials currently recycled is already 75% or more, the implementation of EPR will result in longer term improvements in diversion.

## 2.3 Recycle

The options for recycling have been split into two categories: options that the CRD can implement directly (i.e. implementation falls under the CRD's jurisdiction) and options where the private sector is responsible for implementation.

### 2.3.1 CRD Jurisdiction/Influence

- Continue to accept some source separated C&D materials for recycling at Hartland Landfill.
- Identify new recycling processors and markets for additional C&D materials that could be accepted at Hartland Landfill.
- Encourage the development of more private sector C&D material recycling capacity by choosing one or more of the following options:
  - Enter into a put or pay contract (the CRD would guarantee a selected private sector operator that they would receive a minimum quantity of materials);
  - Enact supporting policies (such as disposal bans or differential tipping fees; see Section 2.4); and/or
  - Facilitate the operation of a collection system (e.g. a network of drop off depots/transfer sites that would send waste to the selected private sector operator). Consider assisting with a pilot program to have wood waste returned to retailers (see an example here: <http://www.metrovancouver.org/mediaroom/Media%20Releases/2009-08-06-WoodDoesntHaveToBeWasted.pdf>. Over two months the depot in The Home Depot parking lot collected over 260 tonnes.).

- Develop a C&D industry toolkit as part of a targeted educational/promotional campaign:
  - Include C&D materials in myrecyclopedia.ca (done);
  - Publicize the inclusion of C&D materials in myrecyclopedia.ca with local construction associations;
  - Develop a Contractors' Guide to Reuse and Recycling; and
  - Work with local industry associations to provide education and outreach. Consider implementation of recognition and awards programs (e.g. C&D version of Hamilton's Gold Box).
- Have a dedicated staff person to work on C&D material management and tracking (in conjunction with other monitoring and measurement options, to be discussed in Phase 4).
- Work with a hauler to test reuse and recycling strategies on a job site (see an example here: <http://www.metrovancouver.org/buildsmart/BuildSmartDocuments/homerenovationwastereductionandrecyclingpilot.pdf>. The test case in Metro Vancouver kept 85% of the materials out of the landfill and cost 1% more than a standard operation).

### 2.3.2 Private Sector Role

- Provide readily accessible drop off depots for source-separated C&D materials throughout the CRD. This will require municipal cooperation in facilitating sites with appropriate zoning.
- Identify or build one or more centralized processing facilities for mixed and source-separated C&D materials. This will require municipal cooperation in facilitating sites with appropriate zoning.

## 2.4 Supporting Policies & Permits

The options for supporting policies have been split into two categories: options that the CRD can implement directly (i.e. implementation falls under the CRD's jurisdiction) and options where the member municipalities would be responsible for implementation.

### 2.4.1 CRD Jurisdiction

- Continue/expand use of variable tipping fees at Hartland to encourage source separation and diversion (i.e. create an incentive for generators to source separate C&D material streams):
  - Fees should (at a minimum) cover the cost of handling the material streams. Fees may be set higher to influence behaviour.
  - Fees should be higher for mixed loads than for source separated materials. This reflects the value of source separated materials and encourages the desired behaviour.
  - If the fees are variable enough, they can have an effect that is similar to a ban. This is effective if there are alternatives to disposal.
- Classify C&D materials as controlled waste at Hartland Landfill (this is proposed in the new bylaw governing Hartland Landfill). This gives the CRD more discretion over its handling.

- Continue/expand disposal bans for C&D materials that have viable alternate end uses.
- Offer a reduced tipping fee for C&D materials that comes from deconstruction projects as an incentive to help offset additional labour costs associated with deconstruction. This is now the practice at the City of Vancouver Landfill: <http://vancouver.ca/home-property-development/green-demolition-practices.aspx>
- Develop model municipal bylaws in consultation with municipal staff and industry representatives for initiatives to be implemented at the municipal level such as:
  - Creating advance deconstruction permits (<http://vancouver.ca/home-property-development/green-demolition-practices.aspx>);
  - Mandatory job site recycling (proposed by Metro Vancouver <http://www.metrovancouver.org/services/solidwaste/planning/SWMP%20Docs/GuideBylawforDLCR recyclingTargetsWorksites.pdf>, in place in Chicago (50%) and Santa Monica (60%));
  - Requiring a waste management plan as part of applying for a construction or demolition permit;
  - Establishing a refundable deposit systems (proposed by Metro Vancouver [http://rcbc.bc.ca/files/u7/Con2012\\_BrodieBerube.pdf](http://rcbc.bc.ca/files/u7/Con2012_BrodieBerube.pdf)); and
  - Required use of authorized recycling/disposal facilities connected to building permits (proposed by Metro Vancouver [http://rcbc.bc.ca/files/u7/Con2012\\_BrodieBerube.pdf](http://rcbc.bc.ca/files/u7/Con2012_BrodieBerube.pdf)).
- Authorize reuse/recycling/resource recovery facilities.
- Adopt green building standards for the CRD's own facilities that emphasize building material reuse (e.g. Hartland Learning Centre, City of Vancouver Asphalt Plant and Materials Testing Facility), LEED® standards, the Canadian Standards Association's Guideline for design for disassembly and adaptability in buildings, or other such systems.
- Facilitate standardization of burning bylaws to minimize impacts from land clearing waste.

## 2.4.2 Municipal and CRD Electoral Area Jurisdiction

- Implement the bylaws described above.
- Fast-track or lower the cost of permits for projects that provide a C&D material management plan and diversion target as part of their submission.
- Vary permit fees to encourage deconstruction over demolition.
- Prohibit demolition without some element of deconstruction.
- Make building re-purposing more attractive through a variety of planning mechanisms (i.e. prevent waste of C&D materials) such as reducing development cost charges. Building re-purposing is the ultimate in reuse.
- Standardize burning bylaws to minimize impacts from land clearing waste.

## Closure

We trust that the information contained in this memorandum meets your present requirements. Please contact us if you have any questions or concerns regarding the above.

**GOLDER ASSOCIATES LTD.**

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