DILLON CONSULTING

Municipal Financial Impact Review

Final Report

May 2015 – 15-1479

May 12, 2015

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ATTENTION: Alanna McPhee
Director of Programs and Development

Municipal Financial Impact Review (Final)

With reference to our proposal of January 12, 2015, we are pleased to submit the final version of the Municipal Financial Impact Review.

If you have any comments or questions regarding this report, please contact the undersigned at your convenience.

Yours truly,

DILLON CONSULTING LIMITED

Scott D. Kyle, P.Eng.
Project Manager

SDK:jes
Attachment
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Contacts and References

Acronyms and Abbreviations

C&D	Construction and Demolition
CBRM	Cape Breton Regional Municipality
DMA	Department of Municipal Affairs
EAC	Equivalent Annual Cost
EMC	Environmental Management Centre
EPR	Extended Producer Responsibility
ESL	Eastern Sanitation Limited
FN	First Nation
FY	Fiscal Year
HDPE	High Density Polyethylene
HHW	Household Hazardous Waste
HRM	Halifax Regional Municipality
ICI	Industrial, Commercial and Institutional
K	thousand
LDPE	Low Density Polyethylene
LF	Landfill
LYW	Leaf and Yard Waste
MODC	Municipality of the District of Chester
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
NA	Not applicable
NPV	Net Present Value
NSCC	Nova Scotia Community College
NSE	Nova Scotia Environment
O&M	Operation and Maintenance
OCC	Old Corrugated Cardboard
OTR	Off the road
PCSWM	Pictou County Solid Waste Management
PET	Polyethylene Terephthalate
PP	Polypropylene
PPP	Printer Paper and Packaging
PVC	Polyvinyl Chloride
Res	Residential
RRFB NS	Resource Recovery Fund Board (Nova Scotia)
SSO	Source Separated Organics
SWM	Solid Waste Management
UNSM	Union of Nova Scotia Municipalities
VWRM	Valley Waste Resource Management
WMF	Waste Management Facility

Definitions

Compostables - Materials that can undergo microbiological decomposition, resulting in a humus-like end product that is primarily used for soil conditioning.

Construction & Demolition (C&D) Debris - Waste materials from the construction, renovation and/or demolition of buildings, usually including wood and metal scrap, brick, block and concrete rubble, wire and packaging. In Nova Scotia, the Solid Waste-Resource Management Regulations define C&D debris as *"materials which are normally used in the construction of buildings, structures, roadways, walls and other landscaping material, and includes, but is not limited to, soil, asphalt, brick, mortar, drywall, plaster, cellulose, fibreglass fibres, gyproc, lumber, wood, asphalt shingles, and metals."*

Diversion - Any environmentally-sustainable initiative that decreases the quantity of waste that must be landfilled or otherwise disposed.

Enforcement - Administrative or legal procedures and actions to require compliance with legislation, regulations or limitations.

Extended Producer Responsibility - A waste management policy approach that identifies end-of-life management of products as the responsibility of producers.

HDPE - HDPE (High Density Polyethylene) refers to a plastic used to make bottles for milk, juice, water and laundry products. Unpigmented HDPE bottles are translucent and have good barrier properties and stiffness.

Household Hazardous Waste (HHW) - Materials commonly found in the home that may cause harm to human health or the environment.

Industrial Waste - Generally liquid, solid or gaseous wastes originating from the manufacture of specific products. Wastes are usually concentrated, variable in content and rate, and require more extensive or different treatment than municipal waste.

Industrial, Commercial and Institutional (ICI) Sector - Includes industries (e.g., manufacturing), businesses and institutions such as schools, universities and hospitals. Municipal waste is often categorized according to whether it is generated by the ICI sector or the residential sector.

Landfill - The disposal of solid wastes or sludges by placing on land, compacting and covering as appropriate with a thin layer of soil. These facilities often rely on bulldozers and compactors as their main piece of equipment for spreading, grading, and covering refuse.

LDPE - LDPE (Low Density Polyethylene) is a plastic used predominantly in film applications due to its toughness, flexibility and relative transparency. LDPE has a low melting point, making it popular for use in applications where heat sealing is necessary. Typically, LDPE is used to manufacture flexible films such as those used for plastic retail bags, garment dry cleaning and grocery bags.

Materials Recovery Facility (MRF) - A facility where materials are processed to separate and recover recyclable materials from the waste stream.

Mixed Waste (or) Mixed Residue - Discarded materials and products which have not been source-separated and therefore may contain compostable or recyclable materials which can be recovered for beneficial use.

Municipal Solid Waste (MSW) - Commonly referred to as garbage, this material is handled by municipal collection and/or disposal services. It includes two main types of solid waste: residential or domestic waste, and industrial, commercial and institutional waste. In Nova Scotia, the Solid Waste-Resource Management Regulations define municipal solid waste as *"…garbage, refuse, sludge, rubbish, tailings, debris, litter and other discarded materials resulting from residential, commercial, institutional and industrial activities which are commonly accepted at a municipal solid waste management facility, but excludes wastes from industrial activities regulated by an approval issued under the Act."*

Net Present Value (NPV) - The difference between the present value of cash inflows and the present value of cash outflows. NPV compares the value of a dollar today to the value of that same dollar in the future, taking inflation and returns into account and is a standard method for using the time value of money to appraise long-term projects.

Organics - Carbon and hydrogen-based materials that can be transformed into humus-like materials through microbiological processes (e.g., composting).

PET - PET or PETE (Polyethylene Terephthalate) is a clear, tough plastic with good gas and moisture barrier properties. Some is used in PET soft drink bottles and other blow molded containers, although sheet applications are increasing. Cleaned, recycled PET flakes and pellets are utilized for spinning fibre for carpet yarns and producing fibrefill and geotextiles.

Product Stewardship - Action undertaken by industry, either voluntarily or as a result of a legislative/regulatory requirement, to provide the appropriate management of a product when it becomes a waste.

Recovery - Typically refers to the recovery of heat for electrical generation through the incineration of solid waste or select waste stream components.

Recyclables - Materials that can be separated from municipal solid waste and reprocessed into new products.

Recycle - When used as a noun, means reutilization of a secondary resource as a result of its inclusion in a manufacturing process. When used as a verb, means the act of recycling.

Residential Sector - Householders, including those who live in detached dwellings, row housing, condominiums and apartments.

Reuse - When used as a noun, means reutilization of a secondary resource without need of a manufacturing process. The term “reuse”, when used as a verb, will be defined to mean the act of reuse.

Source Separation - Classifying and segregating waste/resource materials by category, usually separating various classes of recyclable vs. non-recyclable items, usually done by the generator at the collection or pick-up point (e.g., residences, offices or commercial facilities).

Sustainability - Sustainability can be defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their needs. Sustainability is typically based upon three components: economic growth, social progress, and environmental protection.

Transfer Stations - Temporary storage facility for waste, used in circumstances where the landfill site is located far from the areas where waste is generated. Typically, waste is collected and loaded into large capacity trailers at the station for subsequent bulk transfer to vehicles at the landfill.

Yard Waste - Discarded materials from residential yards and gardens, such as lawn clippings, leaves and prunings. These materials are generally compostable.

Executive Summary

In 2008, acknowledging success to date as well as the need to review and refresh the objectives originally defined in the 1995 Strategy, Nova Scotia Environment (NSE) formed a Strategy Renewal Advisory Committee. The Committee's findings were issued in 2009 in a document entitled *Renewal of Nova Scotia's Waste Resource Management Strategy Consultation Summary Report*. The top two actions that were highlighted in the Consultation Summary Report were; 1) increase product stewardship, and 2) stimulate opportunities to divert the amount of construction and demolition waste sent to landfills.

In 2014, with a noted connection to the Consultation Summary Report, NSE released a document entitled *Revising Our Path Forward: A public discussion paper about solid waste regulation in Nova Scotia*. Founded on consultations with solid waste stakeholders throughout the province, the objective of the Revising Our Path Forward (ROPF) document was to identify potential revisions to the existing Solid Waste-Resource Management Regulations. With reference to that document, the following seven key areas of the regulations were identified for potential amendment:

1. Product Stewardship/Extended Producer Responsibility (EPR).
2. Disposal Bans and Approval Requirements.
3. Used Tire Management Program.
4. Regional Solid Waste Management Plans, Regional Requirements.
5. Regulatory Clarity on Energy from Waste.
6. Improvements to the Enforcement of the Solid Waste Regulations.
7. Beverage Container Deposit Refund Program Efficiency.

In February 2014, Dillon Consulting Limited (Dillon) was contacted by representatives of Pictou County Solid Waste Management (PCSWM), NSE and RRFB Nova Scotia to discuss the requirements to conduct an analysis of the potential public sector cost impacts of implementing the first two potential action items (the third action, Used Tire Management Program, was subsequently added) as described in the ROPF document. In September 2014, PCSWM formally engaged Dillon to conduct the analysis. Dillon's final report, entitled *Diversion Costs Review*, was issued in December 2014.

In December 2014, and with a connection to the PCSWM analysis, RRFB Nova Scotia invited three firms to submit a proposal to conduct a review of the financial impact of implementing ROPF actions 1, 2, 3 and 6 on three additional municipalities (Municipal Financial Impact Review – Proposed Solid Waste Regulations). In January 2015, following the evaluation of the proposals, Dillon was selected to complete the study. During project initiation, a fourth municipality was added to the project scope. Following consultation between RRFB Nova Scotia, Nova Scotia Department of Municipal Affairs (DMA), Union of Nova Scotia Municipalities (UNSM) and NSE, the list of five municipalities/authorities selected to participate in the Municipal Financial Impact Review was confirmed. The participating municipalities/ authorities list was developed with the objective of considering a range of existing municipal waste management situations, including municipal/public sector ownership and operation of all, some or no required processing/disposal facilities. The finalized list of participating municipalities/authorities for the Municipal Financial Impact Review assignment was as follows;

1. Town of Antigonish (project budgetary requirements covered by DMA).
2. Cape Breton Regional Municipality.
3. Municipality of the District of Chester.
4. Municipality of the County of Colchester.
5. Pictou County Solid Waste Management (December 2014 report findings to be updated as necessary).

The analysis focused on the potential waste management system cost implications of implementing actions identified within actions 1, 2, 3 and 6 of the *Revising Our Path Forward* document. With reference to those actions, the specific materials and associated generation sources to be incorporated in the analysis are presented in Table ES-1. Additional effort for municipal enforcement of current provincial littering and open burning regulations will also be included.

TABLE ES-1: WASTE STREAM MATERIALS TO BE ANALYZED

Material	Generation Source	Management/Diversion Program Responsibility	
		Current	Proposed
1) Asphalt Shingles	Res and ICI C&D activities	Municipality/Authority	Municipality/Authority
2) Carpet	Res and ICI C&D activities	Municipality/Authority	EPR Program
3) Clean Wood[1]	Res and ICI C&D activities	Municipality/Authority	Municipality/Authority
4) Wallboard[2]	Res and ICI C&D activities	Municipality/Authority	Municipality/Authority
5) Household Hazardous Waste (HHW)	Res only	Municipality/Authority	EPR Program
6) Mattresses and Box Springs	Res and ICI	Municipality/Authority	EPR Program
7) Packaging and Printer Paper (PPP)	Res only[3]	Municipality/Authority	EPR Program
8) Textiles	Res and ICI	Municipality/Authority	Private Sector/Association for Textile Recycling (AFTeR)
9) Tires[4]	Res and ICI	Municipality/Authority	RRFB Nova Scotia

Notes:
1. Clean wood is typically defined as milled wood that is free of adhesives, coatings and preservatives. In the future, it is anticipated that limited amounts of engineered and coated wood items will be acceptable for incorporation in the overall mass of material that is managed as "clean wood".
2. Wallboard from new construction and renovation activities as well as dismantling ("gutting") of the interiors of concrete and brick structures.
3. Depending on municipality can include multi-residential and condominium units and select ICI sources.
4. Additional "OTR" (off the road) tire sizes from those currently accepted under the provincial program.
Res = Residential, ICI = Industrial, Commercial and Institutional

The following key assumptions were used as a basis for the completion of this assignment:

- The analysis was to develop estimates on costs currently borne specifically by the public sector system, including collection, storage, transfer, processing and disposal.
- The analysis was to utilize information provided by NSE and the subject municipality/authority to support the estimate of current/future tonnage data and associated management costs for the identified waste streams.
- For the purposes of the cost estimate/comparison, a 10 year period (2016-2025) was used for the assessment, with findings being presented as a 2015 Net Present Value (or Cost).

The level of financial analysis provided by the study was to be appropriate for comparative planning purposes only. As presented in Table ES-2, in comparison to current procedures and with a focus

on the period of 2016 to 2025, the implementation of the new waste diversion activities under the Proposed Conditions scenario is forecasted to result in savings (i.e. a reduction of costs) over current expenditure for all five municipalities/authorities that participated in this study. It is acknowledged that a key assumption supporting this finding is that costs associated with the full operation of the curbside blue bag program within the each of the five evaluated municipalities/authorities will be addressed through a proposed Printed Paper and Packaging (PPP) Extended Producer Responsibility (EPR) program.

The completion of this assessment, with regards to the Municipality of Colchester, included the consideration of a variation on the PPP EPR option. Unlike the assumed "default" PPP alternative (with the EPR stewards assuming responsibility for all aspects of a municipality's curbside bluebag program), Colchester County requested that a second option be considered that assumed that they continued to own and operate its Kemptown MRF, serving its existing clientele consistent with current tip fee and tonnage forecasts.

TABLE ES-2: SUMMARY OF ANNUAL NET BENEFIT PER SCENARIO PER MUNICIPALITY

Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)	Annual Savings under Proposed Conditions
		Waste Managed	Net Benefit/tonne		
TOWN OF ANTIGONISH					
Current Conditions	-$1,551,000	5,786	-$268	-$200,860	$142,460
Proposed Conditions	-$451,000	5,832	-$77	-$58,400	
CBRM					
Current Conditions	-$18,668,000	251,848	-$74	-$2,418,000	$1,363,000
Proposed Conditions	-$8,146,000	248,946	-$33	-$1,055,000	
MUNICIPALITY OF THE DISTRICT OF CHESTER					
Current Conditions	-$2,316,000	97,600	-$24	-$299,600	$126,120
Proposed Conditions	-$1,340,000	90,564	-$15	-$173,480	
MUNICIPALITY OF THE COUNTY OF COLCHESTER					
Current Conditions	-$6,987,000	161,250	-$43	-$909,520	$533,800
Proposed Conditions (OPTION 1)	-$2,895,000	86,003	-$34	-$375,720	
Proposed Conditions (OPTION 2)	-$2,972,000	161,586	-$18	-$384,720	$524,800
PICTOU COUNTY SOLID WASTE MANAGEMENT					
Current Conditions	-$5,420,000	65,766	-$82	-$702,520	$234,520
Proposed Conditions	-$3,605,000	64,312	-$56	-$468,000	

Note:
1. Net Benefits (Revenue – Costs) presented are high level figures for planning purposes only. Costs are not inclusive of all relevant cost items (e.g., current amortized capital costs are not included).

With reference to the project assumptions identified above, it is reiterated that the findings presented in this document are “appropriate for comparative planning purposes only”. A significant number of assumptions and approximations (including those associated with future EPR programs and the sale of existing MRF assets in CBRM and Colchester County) were required to conduct the comparative analysis between the “Current Conditions” and “Proposed Conditions” scenarios. A more formalized and robust analysis of both individual material tonnages and current/future management costs could potentially provide a different NPV outcome from that presented in this report.

1.0 Introduction

1.1 Background

Beginning with efforts to formalize engineering and operational activities at disposal sites in the late 1970s, the Province of Nova Scotia has demonstrated an ongoing commitment to improve municipal solid waste management practices within our province. A key milestone occurred in 1995 with the issuing of the Province's Solid Waste Resource Management Strategy – this document served as the basis for the establishment of the foundation elements of Nova Scotia's regional management program. Most notably, the Strategy and subsequent Solid Waste-Resource Management Regulations took the uniquely progressive approach of considering society's residual materials as potentially valuable resources instead of wastes that simply required efficient collection and expedited disposal.

In 2008, acknowledging success to date as well as the need to review and refresh the objectives originally defined in the 1995 Strategy, Nova Scotia Environment (NSE) formed a Strategy Renewal Advisory Committee. The Committee's findings were issued in 2009 in a document entitled *Renewal of Nova Scotia's Waste Resource Management Strategy Consultation Summary Report*. The top two actions that were highlighted in the Consultation Summary Report were 1) increase product stewardship, and 2) stimulate opportunities to divert the amount of construction and demolition waste sent to landfills.

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4. Regional Solid Waste Management Plans, Regional Requirements.
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6. Improvements to the Enforcement of the Solid Waste Regulations.
7. Beverage Container Deposit Refund Program Efficiency.

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In December 2014, and with a connection to the PCSWM analysis, RRFB Nova Scotia invited three firms to submit a proposal to conduct a review of the financial impact of implementing ROPF actions 1, 2, 3 and 6 on three additional municipalities (Municipal Financial Impact Review – Proposed Solid Waste Regulations). In January 2015, following the evaluation of the proposals, Dillon was selected to complete the study. During project initiation, a fourth municipality was added to the project scope with Nova Scotia Department of Municipal Affairs (DMA) serving to address additional budgetary requirements. Following consultation between RRFB Nova Scotia, DMA, Union of Nova Scotia Municipalities (UNSM) and NSE, the list of five municipalities/authorities selected to participate in the Municipal Financial Impact Review was confirmed. It is noted that the participating municipalities/authorities list was developed with the objective of considering a range of existing municipal waste management situations, including municipal/public sector ownership and operation of all, some or no required processing/disposal facilities. The finalized list of participating municipalities/authorities for the Municipal Financial Impact Review assignment was as follows;

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2. Cape Breton Regional Municipality.
3. Municipality of the District of Chester.
4. Municipality of the County of Colchester.
5. Pictou County Solid Waste Management (December 2014 report findings to be updated as necessary).

1.2 Key Assumptions

The following key assumptions were used as a basis for the completion of this assignment:

1. The analysis is to focus on the potential waste management system cost implications of implementing actions identified within actions 1, 2, 3 and 6 of the ROPF document. With reference to those actions, the specific materials and associated generation sources to be incorporated in the analysis are presented in Table 1-1.

TABLE 1-1: WASTE STREAM MATERIALS TO BE ANALYZED

Material	Generation Source	Management/Diversion Program Responsibility	
		Current	Proposed
1. Asphalt Shingles	Res and ICI C&D activities	Municipality/Authority	Municipality/Authority
2. Carpet	Res and ICI C&D activities	Municipality/Authority	EPR Program
3. Clean Wood[1]	Res and ICI C&D activities	Municipality/Authority	Municipality/Authority
4. Wallboard[2]	Res and ICI C&D activities	Municipality/Authority	Municipality/Authority
5. Household Hazardous Waste (HHW)	Res only	Municipality/Authority	EPR Program
6. Mattresses and Box Springs	Res and ICI	Municipality/Authority	EPR Program
7. Packaging and Printer Paper (PPP)	Res only[3]	Municipality/Authority	EPR Program
8. Textiles	Res and ICI	Municipality/Authority	Private Sector/Association for Textile Recycling (AFTeR)
9. Tires[4]	Res and ICI	Municipality/Authority	RRFB Nova Scotia

Notes:
1. Clean wood is typically defined as milled wood that is free of adhesives, coatings and preservatives. In the future, it is anticipated that limited amounts of engineered and coated wood items will be acceptable for incorporation in the overall mass of material that is managed as "clean wood".
2. Wallboard from new construction and renovation activities as well as dismantling ("gutting") of the interiors of concrete and brick structures.
3. Depending on municipality can include multi-residential and condominium units and select ICI sources.
4. Additional "OTR" (off the road) tire sizes from those currently accepted under the provincial program.
Res = Residential
ICI = Industrial, Commercial and Institutional
C&D = Construction and Demolition

2. The analysis is to develop estimates on costs currently borne specifically by the public sector system, including collection, storage, transfer, processing and disposal.
3. The analysis will utilize information provided by NS Environment and the subject municipality/authority to support the estimate of current/future tonnage data and associated management costs for the identified waste streams.
4. For the purposes of the cost estimate/comparison, a 10 year period (2016-2025) will be used for the assessment, with findings being presented as a 2015 Net Present Value (or Cost).
5. The level of financial analysis provided by the study is to be appropriate for comparative planning purposes only.

For the 2016 to 2025 analysis period under the "Proposed Conditions" scenario, the following additional assumptions are noted;

- Costs associated with new site infrastructure and processing requirements for three of the C&D-related materials (asphalt shingles, clean wood, wallboard) will be the responsibility of the subject municipality/authority.
- Costs associated with new site infrastructure and processing requirements for carpet, HHW, mattresses/box springs, printed paper and packaging (PPP), textiles and OTR tires will be the responsibility of designated EPR or private sector-led programs. In the case of PPP, it is noted that it was assumed that a portion of program costs would remain with the subject municipality/authority. Noting the preference for the municipality to continue to own and operate its existing MRF, an additional "Proposed Conditions" scenario has been developed for the County of Colchester (see Section 4.2).
- Conceptual layouts of proposed new material drop off areas at existing municipal waste management facilities are depicted on Figures 4-1 through 4-7.
- Additional assumptions associated with the characterization and forecasting of the Proposed Conditions scenario are presented in Sections 5.1.2 and 5.2.
- Additional details on assumed capital and operating costs to support new diversion activities under the "Proposed Conditions" scenario are discussed in Section 6.1.2.

2.0 Methodology

Completion of this assignment involved the execution of the following six tasks.

Task 1 - Hold Project Initiation Meeting

- Confirmation of the content of the work plan, with a specific emphasis on scope, methodology (including analysis assumptions) and schedule.
- Establishment of contract terms.
- Confirmation of Project Steering Committee and Dillon team member contact coordinates.
- Initiation of the discussion on the preferred attributes of candidate municipalities/waste management authorities to include (in addition to PCSWM) in the study – to be carried forward to Task 2.
- Definition of reporting mechanisms for the project.

Task 2 - Assemble Background Information and Visit Participating Units

- Selection of the participating Municipalities/Regional Authorities (in addition to PCSWM).
  - This requirement was met as a component of Task 1 through a collaborative effort with RRFB Nova Scotia, DMA, UNSM and NSE.
- Background data collection and facility visits for the four new municipalities.
  - Information assembled for PCSWM as part of the 2014 study was carried forward for the purposes of this report.
  - Current/historic cost and material tonnage information for the study area as provided by NSE (e.g., FY2013 Municipal Data Call) and the participating municipalities.
  - Statistics Canada population data for the communities receiving solid waste management services from the participating municipalities.
  - Information on the anticipated components and cost implications of planned EPR programs for carpet, HHW, mattresses/box springs and PPP, as provided by NSE.
  - Completion of a current conditions questionnaire through a face to face meeting with representatives of each participating municipality and the Dillon project team.
  - Escorted tour of facilities that are owned/operated by the participating municipalities to observe current practices associated with the management of the targeted materials.
  - Walkover inspection of existing municipal waste management sites to identify candidate storage and transfer locations to support proposed diversion requirements for the targeted materials.

Task 3 – Develop Material Quality and Quantity Forecasts

- Use of historic population and waste tonnage information to develop a 10 year solid waste generation forecast (2016 – 2025) for the study area.
- Definition of an approximate waste stream characterization to support the preparation of an annual generation tonnage forecast specifically for the nine targeted materials.

Task 4 - Define Current and Proposed Future Management Systems

- For each participating municipality/authority, use of Task 2 and 3 outputs to identify solid waste service and infrastructure requirements for a) continued service under current management requirements, and b) proposed services to meet the requirements of actions 1, 2, 3 and 6 of the ROPF document.

Task 5 - Develop NPV Forecasts for Current & Proposed Management Systems

- Development of an estimate of the current annualized cost for each participating municipality/authority to manage (disposal and/or diversion) the targeted materials as compared to the estimated future annualized costs for to meet the requirements of actions 1, 2, 3 and 6 of the ROPF document. Both gained and lost revenues (e.g., tip fees), where identifiable, were considered in the assessment of current and proposed future conditions.

Task 6 - Prepare Draft and Final Project Reports

- Preparation of a draft project report, including a review meeting with representatives of the participating municipalities/authorities, RRFB Nova Scotia, NSE and DMA.
- Following the confirmation of necessary revisions to the draft document, issuing of a final project report.

3.0 Study Area Descriptions

As described in Section 1.1, five municipalities/authorities were selected for evaluation as part of Financial Impact Review assignment; 1) Town of Antigonish, 2) Cape Breton Regional Municipality (CBRM), 3) Municipality of the District of Chester, 4) Municipality of the County of Colchester, and 5) Pictou County Solid Waste Management (PCSWM). In the case of PCSWM, information assembled as part of their evaluation from the fall of 2014 was to be carried forward, with the analysis and results being revised as necessary. It is noted that all population data presented in this section was acquired from Statistics Canada (www.statcan.gc.ca).

3.1 Town of Antigonish

The Town of Antigonish provides waste management services to residential generators (including apartment buildings with up to four units) within its boundaries. Table 3-1 presents a summary of services provided by the municipality by waste type.

TABLE 3-1: TOWN OF ANTIGONISH SERVICE AREA POPULATIONS – BY MATERIAL TYPE AND SERVICE

	Service Area			
Material and Service	2011 Population	2006 Population	Change from 2006 (%)	Contributing Municipalities
C&D Waste - Collection/Transport	N/A	N/A	N/A	Service not provided by the municipality
C&D Waste - Processing/Disposal	N/A	N/A	N/A	Service not provided by the municipality
MSW - Collection/Transport	4,524	4,236	6.8%	Town of Antigonish
MSW - Processing/Disposal	N/A	N/A	N/A	Service not provided by the municipality
Recyclables - Collection/Transport	4,524	4,236	6.8%	Town of Antigonish
Recyclables - Processing/Marketing	N/A	N/A	N/A	Service not provided by the municipality

Notes:
N/A – not applicable

Antigonish acts as a service and retail hub for the surrounding region, including Antigonish and Guysborough Counties. Key employers include St. Francis Xavier University and St. Martha's Regional Hospital.

Further information on the current waste management-related activities of the Town of Antigonish is provided in Section 4.1.

3.2 Cape Breton Regional Municipality

Cape Breton Regional Municipality provides waste management services to generators within its municipal boundaries as well as several other municipalities situated on Cape Breton Island. Table 3-2 presents a summary of services provided by the municipality by waste type.

TABLE 3-2: CAPE BRETON REGIONAL MUNICIPALITY SERVICE AREA POPULATIONS – BY MATERIAL TYPE AND SERVICE

	Service Area			
Material and Service	2011 Population	2006 Population	Change from 2006 (%)	Contributing Municipalities
C&D Waste - Collection/Transport	N/A	N/A	N/A	Service not provided by the municipality
C&D Waste - Processing/Disposal[1]	97,398	102,250	-4.7%	CBRM
MSW - Collection/Transport	97,398	102,250	-4.7%	CBRM
MSW - Processing/Disposal	N/A	N/A	N/A	Service not provided by the municipality
Recyclables - Collection/Transport	101,613	105,930	-4.1%	CBRM
Recyclables - Processing/Marketing	111,640	115,810	-3.6%	CBRM, Richmond County, Town of Port Hawkesbury, Membertou, Eskasoni

Notes:
N/A – not applicable
1. C&D waste generators have the option of using other Provincially-approved processing/disposal facilities.

In the latter part of the 20th century, CBRM transitioned from an economy focused on heavy industrial activities to one with an emphasis on services, retail and tourism. Noted institutional facilities include the Cape Breton University, Cape Breton Regional Hospital, Northside General Hospital, Glace Bay Health Care Facility, Riverview High School, Sydney Academy, Glace Bay High School, Memorial High School and NSCC's Marconi Campus.

Further information on the current waste management-related activities of CBRM is provided in Section 4.1.

3.3 Municipality of the District of Chester

The Municipality of the District of Chester provides a range of waste management services to its residents and businesses and also offers select services to a number of municipalities in the South Shore and Annapolis Valley regions of the province. Table 3-3 presents a summary of services provided by the municipality by waste type.

TABLE 3-3: MUNICIPALITY OF THE DISTRICT OF CHESTER SERVICE AREA POPULATIONS – BY MATERIAL TYPE AND SERVICE

	Service Area			
Material and Service	2011 Population	2006 Population	Change from 2006 (%)	Contributing Municipalities
C&D Waste - Collection/Transport[1]	10,599	10,741	-1.3%	MD of Chester
C&D Waste - Processing/Disposal[2]	10,599	10,741	-1.3%	MD of Chester
MSW - Collection/Transport	10,599	10,741	-1.3%	MD of Chester
MSW - Processing/Disposal	155,671	155,565	0.1%	MD of Chester, MD of Lunenburg, Annapolis County, Kings County, Town of Annapolis Royal, Town of Berwick, Town of Bridgetown, Town of Bridgewater, Town of Kentville, Town of Lunenburg, Town of Mahone Bay, Town of Middleton, Town of Wolfville
Recyclables - Collection/Transport	10,599	10,741	-1.3%	MD of Chester[3]
Recyclables - Processing/Marketing	N/A	N/A		Service not provided by the municipality

Notes:
N/A – not applicable
1. *Collection provided as part of seasonal bulky waste events.*
2. *C&D waste generators have the option of using other Provincially-approved processing/disposal facilities.*
3. *Town of Lunenburg recyclables delivered to Kaiser Meadow for transport to HRM MRF.*

The most significant employment sectors within the District of Chester are resources (forestry and fisheries), retail and services. The Canexel (Louisiana Pacific Canada Ltd.) wallboard facility in East River and the Atlantica Oak Island Inn in Western Shore are noted industrial/commercial operations within the district. Key institutional facilities include Forest Heights Community School, New Ross Consolidated School, Chester District School and Aspotogan Consolidated Elementary School. It is acknowledged, however, that the 12 other municipalities that are serviced by the Kaizer Meadow Environmental Management Centre include a wide range of significant public and private sector generators.

Further information on the current waste management-related activities of the Municipal District of Chester is provided in Section 4.1.

3.4 Municipality of the County of Colchester

The Municipality of the County of Colchester provides a range of waste management services to its residents and businesses and also offers select services to a number of other municipalities. Table 3-4 presents a summary of services provided by the municipality by waste type.

TABLE 3-4: MUNICIPALITY OF THE COUNTY OF COLCHESTER SERVICE AREA POPULATIONS – BY MATERIAL TYPE AND SERVICE

	Service Area			
Material and Service	2011 Population	2006 Population	Change from 2006 (%)	Contributing Municipalities
C&D Waste - Collection/Transport[1]	52,406	51,444	1.9%	Colchester County, Town of Stewiacke
C&D Waste - Processing/Disposal[2]	63,027	61,788	2.0%	Colchester County, Town of Truro
MSW - Collection/Transport	52,406	51,444	1.9%	Colchester County, Town of Stewiacke
MSW - Processing/Disposal	64,465	63,209	2.0%	Colchester County, Town of Truro, Town of Stewiacke
Recyclables - Collection/Transport	52,406	51,444	1.9%	Colchester County, Town of Stewiacke
Recyclables - Processing/Marketing	125,752	125,810	0.0%	Colchester County, Pictou County, MD of Guysborough, MD of St. Mary's, Town of Antigonish, Town of Truro, Town of Stewiacke, Town of Windsor, Town of Mulgrave, Town of Pictou, Town of New Glasgow, Town of Westville, Town of Stellarton, Town of Trenton, Pictou Landing FN

Notes:
1. *Collection provided as part of seasonal bulky waste events.*
2. *C&D waste generators have the option of using other Provincially-approved processing/disposal facilities.*

Significant employment sectors within Colchester County include agriculture, resources (forestry) and retail. Key institutional facilities within the County include the Agricultural Campus of Dalhousie University (Bible Hill), Debert Industrial Park, Central Colchester Junior High School, Bible Hill Junior High School, West Colchester Consolidated School, North Colchester High School and Cobequid Consolidated Elementary. It is acknowledged, however, that the 13 other municipalities and one First Nation that are serviced by Colchester's facilities at their Kemptown site include a wide range of significant public and private sector generators.

Further information on current waste management-related activities of the County of Colchester is provided in Section 4.1.

3.5 Pictou County Solid Waste Management

As a regional authority, Pictou County Solid Waste Management (PCSWM) oversees solid waste management services for six area municipalities and one local First Nations community. Table 3-5 presents a summary of services provided by the municipality by waste type.

TABLE 3-5: PICTOU COUNTY SOLID WASTE MANAGEMENT SERVICE AREA POPULATIONS – BY MATERIAL TYPE AND SERVICE

	Service Area			
Material and Service	2011 Population	2006 Population	Change from 2006 (%)	Contributing Municipalities
C&D Waste - Collection/ Transport	N/A	N/A	N/A	Service not provided by the authority
C&D Waste - Processing/Disposal[2]	45,641	46,509	-1.9%	Pictou County, Town of Pictou, Town of Stellarton, Town of Trenton, Town of New Glasgow, Town of Westville, Pictou Landing FN
MSW - Collection/Transport	45,641	46,509	-1.9%	Pictou County, Town of Pictou, Town of Stellarton, Town of Trenton, Town of New Glasgow, Town of Westville, Pictou Landing FN
MSW - Processing/Disposal	N/A	N/A	N/A	Service not provided by the authority
Recyclables - Collection/Transport	45,641	46,509	-1.9%	Pictou County, Town of Pictou, Town of Stellarton, Town of Trenton, Town of New Glasgow, Town of Westville, Pictou Landing FN
Recyclables - Processing/Marketing	N/A	N/A	N/A	Service not provided by the authority

Notes:
N/A – not applicable

Manufacturing, retail, services, and construction are important contributors to the area's economy. Key industrial employers include Michelin North America, Northern Pulp Nova Scotia and Scotsburn Cooperative Services. Noted institutional facilities include the Aberdeen Hospital, North Nova Education Centre, Northumberland Regional High School and NSCC's Pictou Campus.

Pictou County Solid Waste Management (PCSWM) was established through an inter-municipal services agreement between the Towns of New Glasgow, Pictou, Stellarton, Trenton and Westville and the Municipality of the County of Pictou. As described in the agreement, "*the Shared Services Authority shall provide services as set by the Board of Directors from time to time, but shall provide services as previously provided by the Planning Commission in relation to…Solid Waste Management – which shall include operation of the Mount William Landfill site, Recycling and Garbage Collection, Waste Reduction Education and Composting Services…*" PCSWM, through a cost recovery arrangement with the First Nation, provide waste collection services to residences at Pictou Landing.

Further information on current waste management-related activities of PCSWM is provided in Section 4.1.

4.0 Services for Targeted Materials

4.1 Current Conditions

Tables 4-1 to 4-5 present a summary of the current management procedures provided/coordinated by each of the five municipalities/authorities that participated in this study. Further, the tables focus on services associated with the nine materials being considered as part of the analysis.

For the 2016 to 2025 analysis period under the "Current Conditions" scenario, it has been assumed that all services presented in the summary table will remain consistent, unless otherwise noted. Additional assumptions associated with the characterization and forecasting of the Current Conditions scenario for the five participating municipalities/authorities are presented in Sections 5.1.1 and 6.1.1.

4.2 Proposed Conditions

Tables 4-6 to 4-11 present a summary of the proposed management procedures to be provided/ coordinated by the five participating municipalities/authorities and other noted entities for the nine materials being considered as part of the analysis.

For the 2016 to 2025 analysis period under the "Proposed Conditions" scenario, the following key assumptions are noted;

- Costs associated with new site infrastructure and processing requirements for C&D-related materials (asphalt shingles, clean wood, wallboard) will be the responsibility of the respective municipality/authority.
- Costs associated with new site infrastructure and processing requirements for HHW, mattresses/box springs, carpet, printed paper and packaging (PPP), textiles and OTR tires will be the responsibility of designated EPR or private sector-led programs. In the case of PPP, it is noted that it was assumed that a portion of program costs would remain with the respective municipality/authority (see Section 6.1.2).
- In the case of municipalities that currently own MRFs, after consultation with the respective municipal owners, the following was assumed under the "Proposed Conditions" scenario:
  - CBRM: The municipality will sell the MRF building and its associated equipment assets in 2016.
  - Colchester County: Option 1 - The municipality will sell the MRF building and its associated equipment assets in 2016, Option 2 - The municipality will continue to be owners/operators of the MRF within the structure of a PPP EPR agreement.
- Conceptual layouts of proposed new material drop off areas at existing municipal waste management facilities are depicted on Figures 4-1 to 4-7. As the Town of Antigonish does not own or operate any solid waste management facilities, no Proposed Conditions figures have been developed for this municipality.
- Additional details on assumed capital and operating costs to support new diversion activities under the "Proposed Conditions" scenario are discussed in Section 6.1.2.

Additional assumptions associated with the characterization and forecasting of the Proposed Conditions scenario are presented in Sections 5.1.2 and 6.1.2.

Table 4-1
Town of Antigonish
Summary of Current Management Procedures for Targeted Materials

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to ESL Adam Street, Beech Hill (Antigonish County) or private sites in mixed C&D loads.	NA	NA	As coordinated by ESL, Beech Hill or private site operators.	-
2	Carpet	Res and ICI C&D activities	Delivered by generators to ESL Adam Street, Beech Hill (Antigonish County) or private sites in mixed C&D loads. Also included in fall/spring residential bulky waste collections.	NA	NA	As coordinated by ESL, Beech Hill or private site operators.	-
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to ESL Adam Street, Beech Hill (Antigonish County) or private sites in mixed C&D loads.	NA	NA	As coordinated by ESL, Beech Hill or private site operators.	-
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to ESL Adam Street, Beech Hill (Antigonish County) or private sites in mixed C&D loads.	NA	NA	As coordinated by ESL, Beech Hill or private site operators.	-
5	HHW	Res only	One drop off event per year in collaboration with Antigonish County.	NA	NA	Contractor removal, processing and disposal.	-
6	Mattresses/Box Springs	Res and ICI	Delivered by generators to ESL Adam Street or Beech Hill (Antigonish County). Also included in fall/spring residential bulky waste collections.	NA	Included in MSW transport to Guysborough Landfill.	Disposal at the Guysborough Regional Landfill.	-
7	Printed Paper and Packaging	Res only	Curbside collection by contractors from Res generators.	NA	Direct haul to Colchester MRF.	Processing and delivery to end markets cooridinated by Colchester MRF.	-
8	Textiles	Res and ICI	Delivered to ESL Adam Street or Beech Hill (Antigonish County) in mixed MSW loads.	NA	Included in MSW transport to Guysborough Landfill.	Disposal at the Guysborough Regional Landfill.	-
9	Tires[2]	Res and ICI	Delivered to ESL Adam Street or Beech Hill (Antigonish County) as individual items.	NA	Included in MSW transport to Guysborough Landfill.	Disposal at the Guysborough Regional Landfill.	-

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Solid Waste-Resources Management By-law; dumping, abandonment or disposal of waste-resources at unlicensed facilities prohibitied.	By-law Enforcement Officer	Currently included as a provincial (NSE) enforcement responsibility in the Solid Waste-Resource Management Regulations. Based on information provided by NSE, approximately 250 staff days per year is directed to this effort for the entire province.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Current three year funding term is set to expire in 2016.
b	Open Burning	Solid Waste-Resources Management By-law; burning of waste-resources in a barrel, stove, other device or in the open prohibited.	By-law Enforcement Officer	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable.

Table 4-2
Cape Breton Regional Municipality
Summary of Current Management Procedures for Targeted Materials

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to CBRM WMF in mixed C&D loads.	NA	NA	Disposed of at on-site C&D landfill.	-
2	Carpet	Res and ICI C&D activities	Delivered by generators to CBRM WMF in mixed C&D loads.	NA	NA	Disposed of at on-site C&D landfill.	-
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to CBRM WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to existing public drop off.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of clean wood by CBRM forces for use in on-site biosolids management activities - end product used as C&D LF cover. Non-extractable quantities within mixed loads to on-site C&D landfill.	"Clean wood" can include items with coatings and adhesives.
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to CBRM WMF in mixed C&D loads.	NA	NA	Disposed of at on-site C&D landfill.	-
5	HHW	Res only	Drop Off at Green Island MRF.	Temporary storage at Green Island MRF.	NA	Contractor removal from Green Island MRF and final off-site processing/disposal.	-
6	Mattresses/Box Springs	Res and ICI	Delivered by generators to CBRM WMF and as part of an annual residential heavy garbage curbside collection.	NA	Included in MSW transport from CBRM Transfer Station to Guysborough Regional Landfill.	Disposal at the Guysborough Regional Landfill.	-
7	Printed Paper and Packaging	Res and ICI	Curbside collection by contractors and municipal forces from Res and select small ICI generators. All ICI generators can deliver PP&P materials to the Green Island MRF with no tip fee charge.	As defined by EPR program.	As defined by EPR program.	Processing at Green Island MRF with subsequent delivery to end markets.	-
8	Textiles	Res and ICI	Delivered to CBRM WMF in mixed MSW loads.	NA	Included in MSW transport from CBRM Transfer Station to Guysborough Regional Landfill.	Disposal at the Guysborough Regional Landfill.	All diversion system costs to be covered by industry program.
9	Tires[2]	Res and ICI	Delivered to CBRM WMF as individual items.	Held temporarily in proximity to the on-site C&D landifll.	Unprocessed tires directed to the CBRM transfer station by municipal forces - included in MSW transport to Guysborough Regional Landfill.	On-site shredder used to process select tires with disposal at on-site C&D landfill. Disposal of remaining tires at the Guysborough Regional Landfill.	-

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Solid Waste Resource Management By-Law S-300; accumulation of litter prohibited, requirement for litter management plans. Public Property By-Law P-300; no deposition of dirt, filth or rubbish on public property. Minimum Standards By-Law M-100; all parts of a building to be kept free of rubbish. Vacant and Derelict Buildings By-Law V-300; no exterior accumulation of debris, rubbish or garbage.	Officer assigned to Solid Waste	Currently included as a provincial (NSE) enforcement responsibility in the Solid Waste-Resource Management Regulations. Based on information provided by NSE, approximately 250 staff days per year is directed to this effort for the entire province.	Officer assigned to Solid Waste partially funded by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Current three year funding term is set to expire in April 2016.
b	Open Burning	None identified.	NA	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

Table 4-3
Municipality of the District of Chester
Summary of Current Management Procedures for Targeted Materials

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to the Kaiser Meadow EMC in mixed C&D loads or in segregated loads using a preferential tip fee.	Temporary storage area for larger segregated quantities (e.g., contractors) near the on-site C&D landfill.	For small quantities, on-site transport from public drop off roll off to the storage area near the on-site C&D landfill.	Grinding of shingles by a contractor to produce a end product for on site road/yard surfacing. Non-extractable quantities within mixed loads to on-site C&D landfill.	Staff report that the number of on-site locations to use processed shingles as a surfacing material is nearing exhaustion - an off-site solution is required.
2	Carpet	Res and ICI C&D activities	Delivered by generators to Kaiser Meadow EMC in mixed C&D loads and as part of two annual residential bulky waste curbside collections.	NA	NA	Disposed of at on-site C&D landfill.	-
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to Kaiser Meadow EMC in mixed C&D loads or in segregated loads using a preferential tip fee.	Temporary storage area for larger segregated quantities (e.g., contractors) near the on-site C&D landfill.	For small quantities, on-site transport from public drop off roll off to the storage area near the on-site C&D landfill.	Grinding of clean wood by a contractor with end product directed to Brooklyn Energy. Grinding of dirty wood for use on-site as landfill cover. Non-extractable quantities within mixed loads to on-site C&D landfill.	"Clean wood" includes bare milled wood items and brush.
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to Kaiser Meadow EMC in mixed C&D loads. Segregated ground wall board received from VWRM.	VWRM wallboard kept in a dedicated stockpile on top of the on-site C&D landfill.	NA	Disposed of at on-site C&D landfill; VWRM material remains in stockpile awaiting a management solution.	-
5	HHW	Res only	Drop off depot at Kaiser Meadow EMC.	Temporary storage at Kaiser Meadow EMC.	NA	Contractor removal from Kaiser Meadow EMC and final off-site processing/disposal.	-
6	Mattresses/Box Springs	Res and ICI	Delivered to Kaiser Meadow EMC and as part of two annual residential bulky waste curbside collections.	NA	NA	Disposal at the on-site MSW landfill.	-
7	Printed Paper and Packaging	Res only	Curbside collection by contractors from Res and ICI (within Res set out limit) generators.	Collected materials directed to dedicated roll off containers on-site.	Roll off containers transported by contractors to HRM's Bayers Lake MRF.	Processing at HRM's Bayers Lake MRF with subsequent delivery to end markets.	-
8	Textiles	Res and ICI	Delivered to Kaiser Meadow EMC in mixed MSW loads.	NA	NA	Disposal at the on-site MSW landfill.	-
9	Tires[2]	Res and ICI	Delivered to Kaiser Meadow EMC as individual items.	Held temporarily in proximity to the on-site C&D landiffl.	NA	Miscellaneous on-site uses. No offsite processing.	-

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Waste Collection and Disposal By-Law #131; no unauthorized waste disposal, deposition or storage. Public Properties By-Law #134; no deposition of garbage, rubbish, filth or refuse on public property. Dangerous or Unsightly Premises Policy P-80; authority to bring an unsightly property into compliance.	Municipal by-law enforcement officer	Currently included as a provincial (NSE) enforcement responsibility in the Solid Waste-Resource Management Regulations. Based on information provided by NSE, approximately 250 staff days per year is directed to this effort for the entire province.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Current three year funding term is set to expire in 2016.
b	Open Burning	Outdoor Fire By-Law; no burning of general, garden or yard waste.	Municipal by-law enforcement officer	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

Table 4-4
Municipality of the County of Colchester
Summary of Current Management Procedures for Targeted Materials

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to the Colchester WMF in mixed C&D loads.	NA	NA	Disposed of at on-site C&D landfill.	-
2	Carpet	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads.	NA	NA	Disposed of at on-site C&D landfill.	-
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	NA	NA	Grinding/removal of clean wood by a contractor. Non-extractable quantities within mixed loads to on-site C&D landfill.	"Clean wood" can include items with coatings and adhesives.
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads.	NA	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of clean wallboard by a contractor for use at the on-site Composting Facility . Non-extractable quantities within mixed loads to on-site C&D landfill.	-
5	HHW	Res only	Monthly drop off (Feb to Nov) at contractor facilities in Debert (Clean Harbours or AIS) plus three mobile drop off events per year within the County.	Temporary storage at contractor facilities.	NA	Contractor processing/disposal.	-
6	Mattresses/Box Springs	Res and ICI	Delivered by generators to Colchester WMF and during spring/fall bulky waste residential curbside collections.	NA	NA	Disposal at the on-site balefill.	-
7	Printed Paper and Packaging	Res and ICI	Curbside collection by contractors from Res generators.	NA	NA	Processing at on-site (Colchester) MRF.	Materials from 13 municipalities, one First Nation plus Colchester County are processed at the Colchester MRF.
8	Textiles	Res and ICI	Delivered to Colchester WMF in mixed MSW loads.	NA	Included in MSW transport from the baling station to the on-site balefill.	Disposal at the on-site balefill.	-
9	Tires[2]	Res and ICI	Delivered to Colchester WMF as individual items.	Held temporarily in proximity to the on-site C&D landfill.	NA	Select tires sold to local reprocessor - others placed in the on-site balefill.	-

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Solid Waste By-law; no illegal dumping, no accumulation of solid waste, removal of uncollected/scattered solid waste, no placement of waste on a property without consent.	Municipal by-law enforcement officer	Currently included as a provincial (NSE) enforcement responsibility in the Solid Waste-Resource Management Regulations. Based on information provided by NSE, approximately 250 staff days per year is directed to this effort for the entire province.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Current three year funding term is set to expire in 2016.
b	Open Burning	Solid Waste By-law; no solid waste burning.	Municipal by-law enforcement officer	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

Table 4-5
Pictou County Solid Waste Management
Summary of Current Management Procedures for Targeted Materials

			PCSWM Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to Mount William in mixed C&D loads.	NA	For small quantities, on-site transport from public drop off bins to the on-site C&D landfill.	Disposed of at on-site C&D landfill.	-
2	Carpet	Res and ICI C&D activities	Delivered by generators to Mount William in mixed C&D loads.	NA	NA	Disposed of at on-site C&D landfill.	-
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to Mount William in mixed C&D loads.	NA	NA	Disposed of at on-site C&D landfill.	Initial segregation/ grinding efforts commenced in late 2014.
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to Mount William in mixed C&D loads.	NA	NA	Disposed of at on-site C&D landfill.	-
5	HHW	Res only	Drop Off at PCSWM Admin Building + Mobile Collection Trailer (beginning 2014).	Temporary storage at HHW Building.	NA	Contractor removal from Mount William and final off-site processing/disposal.	-
6	Mattresses/Box Springs	Res and ICI	Delivered by generators to Mount William.	NA	Included in MSW transport to Guysborough Landfill.	Disposal at the Guysborough Regional Landfill.	-
7	Printed Paper and Packaging	Res with a small proportion of ICI	Curbside collection by contractors from Res and select small ICI generators.	Temporary storage of blue bags within Transfer Station building.	Included in recyclables transport to Colchester MRF.	Processing and delivery to end markets cooridinated by Colchester MRF.	-
8	Textiles	Res and ICI	Delivered to Mount William in mixed MSW loads.	NA	Included in MSW transport to Guysborough Landfill.	Disposal at the Guysborough Regional Landfill.	-
9	Tires[2]	Res and ICI	Delivered to Mount William in mixed MSW loads.	NA	Included in MSW transport to Guysborough Landfill.	Disposal at the Guysborough Regional Landfill.	-

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Pictou County Solid Waste Management System Solid Waste-Resource Management Bylaw; requirement of property owners/ generators and contractors to remove litter associated with waste collection activities, illegal dumping prohibited.	Bylaw Enforcement Officer (any town police offcer or bylaw officer of a municipality).	Currently included as a provincial (NSE) enforcement responsibility in the Solid Waste-Resource Management Regulations. Based on information provided by NSE, approximately 250 staff days per year is directed to this effort for the entire province.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Current three year funding term is set to expire in 2016.
b	Open Burning	Pictou County Solid Waste Management System Solid Waste-Resource Management Bylaw; prohibition on burning of waste/recyclables with the exception of clean wood.	Bylaw Enforcement Officer (any town police offcer or bylaw officer of a municipality).	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

Table 4-6
Town of Antigonish
Summary of Proposed Future Management Procedures for Targeted Materials

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to ESL Adam Street, Beech Hill (Antigonish County) or private sites in mixed C&D loads or in segregated quantities.	NA	NA	As coordinated by ESL, Beech Hill or private site operators, consistent with new regulatory requirements.	-
2	Carpet	Res and ICI C&D activities	Delivered by generators to ESL Adam Street, Beech Hill (Antigonish County) or private sites in mixed C&D loads or in segregated quantities. Also included in fall/spring residential bulky waste collections.	NA	NA	As coordinated by ESL, Beech Hill or private site operators consistent with requirements of EPR program.	-
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to ESL Adam Street, Beech Hill (Antigonish County) or private sites in mixed C&D loads or in segregated quantities.	NA	NA	As coordinated by ESL, Beech Hill or private site operators, consistent with new regulatory requirements.	-
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to ESL Adam Street, Beech Hill (Antigonish County) or private sites in mixed C&D loads or in segregated quantities.	NA	NA	As coordinated by ESL, Beech Hill or private site operators, consistent with new regulatory requirements.	-
5	HHW	Res only	As defined by EPR program.	As defined by EPR program.	As defined by EPR program.	As defined by EPR program.	80% of diversion program costs to be covered by private sector-led program, remainder by Town of Antigonish.
6	Mattresses/Box Springs	Res and ICI	Delivered by generators to ESL Adam Street or Beech Hill (Antigonish County). Also included in fall/spring residential bulky waste collections.	As defined by EPR program.	As defined by EPR program.	Contractor removal via EPR program from drop off locations and final off-site processing/disposal.	All diversion program costs to be covered by EPR program.
7	Printed Paper and Packaging	Res only	Curbside collection by contractors from Res generators - coordinated/paid for as part of the PPP EPR agreement.	As defined by EPR program.	As defined by EPR program.	Processing at an EPR-designated MRF with subsequent delivery to end markets.	Assume a 5% increase in total collected PPP tonnage under the Proposed Conditions scenario. 70% of diversion system costs to be covered by EPR program, remainder by Town of Antigonish.
8	Textiles	Res and ICI	Delivered to ESL Adam Street or Beech Hill (Antigonish County) in mixed MSW loads or in segregated quantities to drop off containers.	Segregated textiles to dedicated storage containers (provided by stewards).	Textiles remaining in mixed waste included in MSW transport to Guysborough Regional Landfill.	Contractor removal via Private Sector program from drop off containers and final off-site processing/disposal. Textiles remaining in mixed waste disposed at the Guysborough Regional Landfill.	All diversion program costs to be covered by industry program.
9	Tires[2]	Res and ICI	Delivered to ESL Adam Street or Beech Hill (Antigonish County) as individual items.	NA	NA	Contractor removal via EPR program from ESL Adam Street or Beech Hill (Antigonish County) and final off-site processing/disposal.	All diversion program costs to be covered by EPR program.

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Solid Waste-Reources Management By-law; dumping, abandonment or disposal of waste-resources at unlicensed facilities prohibited.	By-law Enforcement Officer	Solid Waste-Resource Management Regulations to be revised to limit NSE enforcement mandate to indicidents that present a potential for significant environmental impact.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Additional municipal effort to assume previous NSE enforcement responsibilities to be determined based on area population.
b	Open Burning	Solid Waste-Reources Management By-law; burning of waste-resources in a barrel, stove, other device or in the open prohibited.	By-law Enforcement Officer	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable.

Table 4-7
Cape Breton Regional Municipality
Summary of Proposed Future Management Procedures for Targeted Materials

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to CBRM WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to existing public drop off.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of shingles to produce a divertable end product (Halifax C&D procedure). Non-extractable quantities within mixed loads to on-site C&D landfill.	Assumed collection of segregated shingles by Halifax C&D with transport to their Milford NS processing facility.
2	Carpet	Res and ICI C&D activities	Delivered by generators to CBRM WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from CBRM WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to CBRM WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to existing public drop off.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of clean wood by CBRM forces for use in on-site biosolids management activities - end product used as C&D LF cover. Non-extractable quantities within mixed loads to on-site C&D landfill.	"Clean wood" can include items with coatings and adhesives.
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to CBRM WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to existing public drop off.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of clean wallboard by CBRM forces for use at the adjacent Composting Facility . Non-extractable quantities within mixed loads to on-site C&D landfill.	Ability of CBRM Composting Facility to accept ground wallboard to be confirmed in the future.
5	HHW	Res only	Drop Off at Green Island MRF.	Temporary storage at Green Island MRF.	NA	Contractor removal via EPR program from Green Island MRF and final off-site processing/disposal.	80% of diversion system costs to be covered by private sector-led program, remainder by CBRM.
6	Mattresses/Box Springs	Res and ICI	Delivered by generators to CBRM WMF and as part of an annual residential heavy garbage curbside collection.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from CBRM WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.
7	Printed Paper and Packaging	Res only	Curbside collection by contractors from Res generators - coordinated/paid for as part of the PPP EPR agreement.	As defined by EPR program.	As defined by EPR program.	Processing at an EPR-designated MRF with subsequent delivery to end markets.	Assume a 5% increase in total collected PPP tonnage under the Proposed Conditions scenario. 70% of diversion system costs to be covered by EPR program, remainder by CBRM.
8	Textiles	Res and ICI	Delivered to CBRM WMF in mixed MSW loads or in segregated quantities.	Segregated textiles to on-site storage containers (provided by stewards).	Textiles remaining in mixed waste included in MSW transport to Guysborough Regional Landfill.	Contractor removal via EPR program from CBRM WMF and final off-site processing/disposal. Textiles remaining in mixed waste disposed at the Guysborough Regional Landfill.	All diversion system costs to be covered by industry program.
9	Tires[2]	Res and ICI	Delivered to CBRM WMF as individual items.	Held temporarily in a dedicated area in proximity to the on-site C&D landifll.	NA	Contractor removal via EPR program from CBRM WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Solid Waste Resource Management By-Law S-300; accumulation of litter prohibited, requirement for litter management plans. Public Property By-Law P-300; no deposition of dirt, filth or rubbish on public property. Minimum Standards By-Law M-100; all parts of a building to be kept free of rubbish. Vacant and Derelict Buildings By-Law V-300; no exterior accumulation of debris, rubbish or garbage.	Officer assigned to Solid Waste	Solid Waste-Resource Management Regulations to be revised to limit NSE enforcement mandate to indicidents that present a potential for significant environmental impact.	Officer assigned to Solid Waste partially funded by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Additional municipal effort to assume previous NSE enforcement responsibilities to be determined based on area population.
b	Open Burning	Include a prohibition on the open burning of waste as a component of By-Law S-300.	Officer assigned to Solid Waste	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

Table 4-8
Municipality of the District of Chester
Summary of Proposed Future Management Procedures for Targeted Materials

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to the Kaiser Meadow EMC in mixed C&D loads or in segregated loads using a preferential tip fee.	Temporary storage area for larger segregated quantities (e.g., contractors) near the on-site C&D landfill.	For small quantities, on-site transport from public drop off roll off to the storage area near the on-site C&D landfill.	Grinding of shingles to produce a divertable end product (Halifax C&D procedure). Non-extractable quantities within mixed loads to on-site C&D landfill.	Assumed collection of segregated shingles by Halifax C&D with transport to their Milford NS processing facility.
2	Carpet	Res and ICI C&D activities	Delivered by generators to Kaiser Meadow EMC in mixed C&D loads, as part of two annual residential bulky waste curbside collections or in segregated loads using a preferential tip fee.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from Kaiser Meadow EMC and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to Kaiser Meadow EMC in mixed C&D loads or in segregated loads using a preferential tip fee.	Temporary storage area for larger segregated quantities (e.g., contractors) near the on-site C&D landfill.	For small quantities, on-site transport from public drop off roll off to the storage area near the on-site C&D landfill.	Grinding of clean wood by a contractor with end product directed to Brooklyn Energy. Grinding of dirty wood for use on-site as landfill cover. Non-extractable quantities within mixed loads to on-site C&D landfill.	"Clean wood" includes bare milled wood items and brush.
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to Kaiser Meadow EMC in mixed C&D loads or in segregated loads using a preferential tip fee. Segregated ground wall board received from VWRM.	Segregated wallboard kept in a dedicated stockpile on top of the on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Transport of ground wallboard to Whynott's Settlement for use at the Composting Facility.	Ability of Whynott's Settlement Composting Facility to accept ground wallboard to be confirmed in the future.
5	HHW	Res only	Drop off depot at Kaiser Meadow EMC.	Temporary storage at Kaiser Meadow EMC.	Return of Trailer to Kaiser Meadow EMC as required	Contractor removal from Kaiser Meadow EMC and final off-site processing/disposal.	80% of diversion system costs to be covered by private sector-led program, remainder by MODC.
6	Mattresses/Box Springs	Res and ICI	Delivered to Kaiser Meadow EMC and as part of two annual residential bulky waste curbside collections.	NA	NA	Contractor removal via EPR program from Kaiser Meadow EMC and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.
7	Printed Paper and Packaging	Res only	Curbside collection by contractors from Res generators - coordinated/paid for as part of the PPP EPR agreement.	As defined by EPR program.	As defined by EPR program.	Processing at an EPR-designated MRF with subsequent delivery to end markets.	Assume a 5% increase in total collected PPP tonnage under the Proposed Conditions scenario. 70% of diversion system costs to be covered by EPR program, remainder by MODC.
8	Textiles	Res and ICI	Delivered to Kaiser Meadow EMC in mixed MSW loads.	Segregated textiles to on-site storage containers (provided by stewards).	NA	Disposal at the on-site MSW landfill.	All diversion system costs to be covered by industry program.
9	Tires[2]	Res and ICI	Delivered to Kaiser Meadow EMC as individual items.	Held temporarily in a dedicated area in proximity to the on-site C&D landfill.	NA	Contractor removal via EPR program from Kaiser Meadow EMC and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Waste Collection and Disposal By-Law #131; no unauthorized waste disposal, deposition or storage. Public Properties By-Law #134; no deposition of garbage, rubbish, filth or refuse on public property. Dangerous or Unsightly Premises Policy P-80; authority to bring an unsightly property into compliance.	Municipal by-law enforcement officer	Solid Waste-Resource Management Regulations to be revised to limit NSE enforcement mandate to indicidents that present a potential for significant environmental impact.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Additional municipal effort to assume previous NSE enforcement responsibilities to be determined based on area population.
b	Open Burning	Outdoor Fire By-Law; no burning of general, garden or yard waste.	Municipal by-law enforcement officer	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

Table 4-9
Municipality of the County of Colchester
Summary of Proposed Future Management Procedures for Targeted Materials - PPP Option 1

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of shingles to produce a divertable end product (Halifax C&D procedure). Non-extractable quantities within mixed loads to on-site C&D landfill.	Assumed collection of segregated shingles by Halifax C&D with transport to their Milford NS processing facility.
2	Carpet	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from Colchester WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding/removal of clean wood by a contractor. Non-extractable quantities within mixed loads to on-site C&D landfill.	"Clean wood" can include items with coatings and adhesives.
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of clean wallboard by a contractor for use at the on-site Composting Facility . Non-extractable quantities within mixed loads to on-site C&D landfill.	Ability of Colchester Composting Facility to accept ground wallboard to be confirmed in the future.
5	HHW	Res only	As defined by EPR program.	As defined by EPR program.	As defined by EPR program.	As defined by EPR program.	80% of diversion system costs to be covered by private sector-led program, remainder by Colchester.
6	Mattresses/Box Springs	Res and ICI	Delivered by residential generators to Colchester WMF and as part of an annual residential heavy garbage curbside collection. Direct delivery by ICI generators.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from Colchester WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.
7	Printed Paper and Packaging	Res only	Curbside collection by contractors from Res generators - coordinated/paid for as part of the PPP EPR agreement.	As defined by EPR program.	As defined by EPR program.	Processing at an EPR-designated MRF with subsequent delivery to end markets.	Assume a 5% increase in total collected PPP tonnage under the Proposed Conditions scenario. 70% of diversion system costs to be covered by EPR program, remainder by Colchester (TBC).
8	Textiles	Res and ICI	Delivered to Colchester WMF in mixed MSW loads or in segregated quantities.	Segregated textiles to on-site storage containers (provided by stewards).	NA	Contractor removal via EPR program from Colchester WMF and final off-site processing/disposal. Textiles remaining in mixed waste disposed at the on-site balefill.	All diversion system costs to be covered by industry program.
9	Tires[2]	Res and ICI	Delivered to Colchester WMF as individual items.	Held temporarily in a dedicated area in proximity to the on-site C&D landfill.	NA	Contractor removal via EPR program from Colchester WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Solid Waste By-law; no illegal dumping, no accumulation of solid waste, removal of uncollected/scattered solid waste, no placement of waste on a property without consent.	Municipal by-law enforcement officer	Solid Waste-Resource Management Regulations to be revised to limit NSE enforcement mandate to indicidents that present a potential for significant environmental impact.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Additional municipal effort to assume previous NSE enforcement responsibilities to be determined based on area population.
b	Open Burning	Solid Waste By-law; no solid waste burning.	Municipal by-law enforcement officer	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

Table 4-10
Municipality of the County of Colchester
Summary of Proposed Future Management Procedures for Targeted Materials - PPP Option 2

			Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of shingles to produce a divertable end product (Halifax C&D procedure). Non-extractable quantities within mixed loads to on-site C&D landfill.	Assumed collection of segregated shingles by Halifax C&D with transport to their Milford NS processing facility.
2	Carpet	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from Colchester WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding/removal of clean wood by a contractor. Non-extractable quantities within mixed loads to on-site C&D landfill.	"Clean wood" can include items with coatings and adhesives.
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to Colchester WMF in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of clean wallboard by a contractor for use at the on-site Composting Facility . Non-extractable quantities within mixed loads to on-site C&D landfill.	Ability of Colchester Composting Facility to accept ground wallboard to be confirmed in the future.
5	HHW	Res only	As defined by EPR program.	As defined by EPR program.	As defined by EPR program.	As defined by EPR program.	80% of diversion system costs to be covered by private sector-led program, remainder by Colchester.
6	Mattresses/Box Springs	Res and ICI	Delivered by residential generators to Colchester WMF and as part of an annual residential heavy garbage curbside collection. Direct delivery by ICI generators.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from Colchester WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.
7	Printed Paper and Packaging	Res and ICI	Curbside collection by contractors from Res generators - coordinated/paid for as part of the PPP EPR agreement.	NA	NA	Processing at on-site (Colchester) MRF.	Assume PPP tonnage remains consistent with Existing Conditions forecast (with a 5% increase in tonnages). Assume Colchester continues to serve as owner/operator of MRF. Use the current MRF net per tonne cost/revenue value as a basis for future financial forecasting. 70% of PPP collection costs to be covered by EPR program, remainder by Colchester (TBC).
8	Textiles	Res and ICI	Delivered to Colchester WMF in mixed MSW loads or in segregated quantities.	Segregated textiles to on-site storage containers (provided by stewards).	NA	Contractor removal via EPR program from Colchester WMF and final off-site processing/disposal. Textiles remaining in mixed waste disposed at the on-site balefill.	All diversion system costs to be covered by industry program.
9	Tires[2]	Res and ICI	Delivered to Colchester WMF as individual items.	Held temporarily in a dedicated area in proximity to the on-site C&D landfill.	NA	Contractor removal via EPR program from Colchester WMF and final off-site processing/disposal.	All diversion system costs to be covered by EPR program.

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Solid Waste By-law; no illegal dumping, no accumulation of solid waste, removal of uncollected/scattered solid waste, no placement of waste on a property without consent.	Municipal by-law enforcement officer	Solid Waste-Resource Management Regulations to be revised to limit NSE enforcement mandate to indicidents that present a potential for significant environmental impact.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Additional municipal effort to assume previous NSE enforcement responsibilities to be determined based on area population.
b	Open Burning	Solid Waste By-law; no solid waste burning.	Municipal by-law enforcement officer	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

Table 4-11
Pictou County Solid Waste Management
Summary of Proposed Future Management Procedures for Targeted Materials

			PCSWM Management Procedures				
	Material	Generation Source	Collection	Storage	Transport	Processing/Disposal	Notes
No.			Description	Description	Description	Description	
1	Asphalt Shingles	Res and ICI C&D activities	Delivered by generators to Mount William in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to the on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of shingles to produce a divertable end product (Halifax C&D procedure). Non-extractable quantities within mixed loads to on-site C&D landfill.	Assumed collection of segregated shingles by Halifax C&D with transport to their Milford NS processing facility.
2	Carpet	Res and ICI C&D activities	Delivered by generators to Mount William in mixed C&D loads or in segregated loads using a preferential tip fee.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from Mount William and final off-site processing/disposal.	All diversion program costs to be covered by EPR program.
3	Clean Wood	Res and ICI C&D activities	Delivered by generators to Mount William in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to the on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of clean wood by a contractor for use in on-site composting activities. Non-extractable quantities within mixed loads to on-site C&D landfill.	-
4	Wallboard[1]	Res and ICI C&D activities	Delivered by generators to Mount William in mixed C&D loads or in segregated loads using a preferential tip fee.	Segregated quantities directed to storage area adjacent to the on-site C&D landfill.	For small quantities, on-site transport from new public drop off area to the on-site C&D landfill.	Grinding of clean wallboard by PCSWM forces for use in on-site composting activities. Non-extractable quantities within mixed loads to on-site C&D landfill.	-
5	HHW	Res only	Drop Off at PCSWM Admin Building + Mobile Collection Trailer.	Temporary storage at HHW Building.	Return of Trailer to Mount William as required.	Contractor removal via private sector-led program from Mount William and final off-site processing/disposal.	80% of diversion program costs to be covered by private sector-led program, remainder by PCSWM.
6	Mattresses/Box Springs	Res and ICI	Delivered by generators to Mount William.	Dedicated, weather protected, 40 cy roll off container on-site. Bay to be added to existing public drop off structure.	NA	Contractor removal via EPR program from Mount William and final off-site processing/disposal.	All diversion program costs to be covered by EPR program.
7	Printed Paper and Packaging	Res with a small proportion of ICI	Curbside collection by contractors from Res generators - coordinated/paid for as part of the PPP EPR agreement.	As defined by EPR program.	As defined by EPR program.	Processing at an EPR-designated MRF with subsequent delivery to end markets.	Assume a 5% increase in total collected PPP tonnage under the Proposed Conditions scenario. 70% of diversion program costs to be covered by EPR program, remainder by PCSWM.
8	Textiles	Res and ICI	Delivered to Mount William in mixed MSW loads or in segregated quantities.	Segregated textiles to on-site storage containers (provided by stewards).	Textiles remaining in mixed waste included in MSW transport to Guysborough Regional Landfill.	Contractor removal via Private Sector program from Mount William and final off-site processing/disposal. Textiles remaining in mixed waste disposed at the Guysborough Regional Landfill.	All diversion program costs to be covered by industry program.
9	Tires[2]	Res and ICI	Delivered to Mount William in mixed MSW loads or in segregated quantities.	Segregated tires and tires removed from tip floor to on-site storage pen (existing).	NA	Contractor removal via EPR program from Mount William and final off-site processing/disposal.	All diversion program costs to be covered by EPR program.

	Littering/Open Burning Provisions	Municipal By-Laws	Municipal Enforcement	Provincial Role/Support Activities	Notes
a	Littering	Pictou County Solid Waste Management System Solid Waste-Resource Management Bylaw; requirement of property owners/ generators and contractors to remove litter associated with waste collection activities, illegal dumping prohibited.	Bylaw Enforcement Officer (any town police offcer or bylaw officer of a municipality).	Solid Waste-Resource Management Regulations to be revised to limit NSE enforcement mandate to indicidents that present a potential for significant environmental impact.	Enforcement of municipal waste management bylaws supported by a $100K/year regional allowance (Municipal Enforcement Program) from RRFB NS. Additional municipal effort to assume previous NSE enforcement responsibilities to be determined based on area population.
b	Open Burning	Pictou County Solid Waste Management System Solid Waste-Resource Management Bylaw; prohibition on burning of waste/recyclables with the exception of clean wood.	Bylaw Enforcement Officer (any town police offcer or bylaw officer of a municipality).	See above	See above

Notes:
1. Wallboard from new construction, renovation and interior dismantling activities.
2. Additional tire sizes from those currently accepted under the provincial program.

NA: Not applicable

DILLON CONSULTING

DATE MAY 2015

PROJECT **MUNICIPAL FINANCIAL IMPACT REVIEW**

PROJECT NO. **15-1479**

TITLE **PROPOSED FACILITIES**
CBRM SOLID WASTE MANAGEMENT FACILITY

FIGURE NO. **4-1**

FileName: c:\projectwise\working directory\active\50tlr\dms42238\151479-00-site-fig4-1.dwg

DILLON CONSULTING

DATE: MAY 2015	PROJECT: MUNICIPAL FINANCIAL IMPACT REVIEW	PROJECT NO.: 15-1479
	TITLE: PROPOSED FACILITIES KAIZER MEADOW ENVIRONMENTAL MANAGEMENT CENTRE	FIGURE NO.: 4-2

FileName: c:\projectwise\working directory\active\50tlr\dms42238\151479-00-site-fig4-2.dwg

DILLON CONSULTING

DATE MAY 2015

PROJECT **MUNICIPAL FINANCIAL IMPACT REVIEW**

PROJECT NO. **15-1479**

TITLE **PROPOSED FACILITIES**
KAIZER MEADOW ENVIRONMENTAL MANAGEMENT CENTRE

FIGURE NO. **4-3**

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DILLON CONSULTING

DATE: MAY 2015	PROJECT: MUNICIPAL FINANCIAL IMPACT REVIEW	PROJECT NO.: 15-1479
	TITLE: PROPOSED FACILITIES COLCHESTER WASTE MANAGEMENT FACILITY	FIGURE NO.: 4-4

FileName: c:\projectwise\working directory\active\50tlr\dms42238\151479-00-site-fig4-4.dwg

DILLON CONSULTING

DATE MAY 2015

PROJECT **MUNICIPAL FINANCIAL IMPACT REVIEW**

PROJECT NO. **15-1479**

TITLE **PROPOSED FACILITIES**
COLCHESTER WASTE MANAGEMENT FACILITY

FIGURE NO. **4-5**

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DILLON CONSULTING

DATE MAY 2015

PROJECT **MUNICIPAL FINANCIAL IMPACT REVIEW**

PROJECT NO. **15-1479**

TITLE **PROPOSED FACILITIES MOUNT WILLIAM TRANSFER STATION**

FIGURE NO. **4-6**

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DILLON CONSULTING

PROJECT	MUNICIPAL FINANCIAL IMPACT REVIEW	PROJECT NO. 15-1479
TITLE	PROPOSED FACILITIES MOUNT WILLIAM TRANSFER STATION	FIGURE NO. 4-7
DATE MAY 2015		

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5.0 Waste Generation Forecast

The waste stream for a given area can be characterized by defining a percentage breakdown of specific material types. This definition of composition is essential as it allows (in concert with an overall waste stream quantity estimate) for the estimation of quantities of specific materials (e.g., recyclables, C&D materials, etc.) and the operational requirements for future infrastructure and related systems. As the nine items described in Table 1-1 in Section 1.2 are the focal point of this study, the project team was primarily concerned with these materials as part of the overall waste stream.

5.1 Assumptions

For this study, a generated waste characterization for the year 2012 was developed as a baseline. The baseline waste characterization was for tonnages managed by the five participating municipalities/authorities only, and did not include the C&D materials managed by private sites. No single ideal data source was identified to properly characterize the quantities of the nine materials that are managed by the municipalities/authorities evaluated as part of this assignment. Thus, the project team used its best judgment to develop an approximate breakdown.

In order to develop approximate quantities of the nine materials, the waste tonnage data submitted to the NSE Data Call by each of the five participating municipalities/authorities for fiscal year (FY) 2013 was used in conjunction with waste audit data from municipalities with similar populations and geographic conditions. Waste generation data for a few select materials was provided by NSE and the RRFB Nova Scotia.

The sources of information and assumptions made to create the generated waste quantity baseline and forecast for the Current Conditions scenario are presented in Section 5.1.1. The assumptions used to determine quantities managed in the Proposed Conditions scenario are presented in Section 5.1.2.

5.1.1 Current Conditions

Material 1: Asphalt Shingles

Source of Baseline Generated Waste Tonnage Info: FY2013 Data Call
Assumptions on Material Handling:

- Town of Antigonish
  - No direct C&D material services are coordinated/provided by the Town
  - 100% of generated materials are landfilled at a C&D site in the region
- CBRM
  - 100% of incoming materials are landfilled at the CBRM C&D site
- Municipality of the District of Chester
  - 75% of incoming asphalt shingles (segregated) are processed as onsite road/yard surfacing material
  - Acknowledges limited acceptance of mixed C&D loads at the Kaizer Meadow facility
  - Remainder of incoming materials are landfilled at the Kaizer Meadow C&D site
- Municipality of the County of Colchester
  - 100% of incoming materials are landfilled at the Colchester County C&D site

- Pictou County Solid Waste Management
  - 100% of incoming materials are landfilled at the PCSWM C&D site

Material 2: Carpet

Source of Baseline Generated Waste Tonnage Info: FY2013 Data Call
Assumptions on Material Handling:

- Town of Antigonish
  - Town services for carpet limited to fall/spring residential bulky waste collection by contractor
  - 100% of generated materials are landfilled at a C&D site in the region
- CBRM
  - 100% of incoming materials are landfilled at the CBRM C&D site
- Municipality of the District of Chester
  - 100% of incoming materials are landfilled at the Kaizer Meadow C&D site
- Municipality of the County of Colchester
  - 100% of incoming materials are landfilled at the Colchester County C&D site
- Pictou County Solid Waste Management
  - 100% of incoming materials are landfilled at the PCSWM C&D site

Material 3: Clean Wood

Source of Baseline Generated Waste Tonnage Info: FY2013 Data Call
Assumptions on Material Handling:

- Town of Antigonish
  - No direct C&D material services are coordinated/provided by the Town
  - 100% of generated materials are landfilled at a C&D site in the region
- CBRM
  - 70% of incoming clean wood is processed to produce C&D LF cover (it is noted that CBRM currently manage wood under one “mixed” category; no clear designation of clean versus dirty wood)
  - Remainder of incoming materials are landfilled at the CBRM C&D site
- Municipality of the District of Chester
  - 80% of incoming clean wood is processed and used as fuel at Brooklyn Energy
  - 80% of incoming dirty wood is processed to produce landfill cover
  - Acknowledges limited acceptance of mixed C&D loads at the Kaizer Meadow facility
  - Remainder of incoming materials are landfilled at the Kaizer Meadow C&D site
- Municipality of the County of Colchester
  - 50% of incoming clean wood is processed and removed from the site by a contractor
  - Remainder of incoming materials are landfilled at the Colchester County C&D site
- Pictou County Solid Waste Management
  - 100% of incoming materials are landfilled at the PCSWM C&D site

Material 4: Wallboard

Source of Baseline Generated Waste Tonnage Info: FY2013 Data Call
Assumptions on Material Handling:

- Town of Antigonish
  - No direct C&D material services are coordinated/provided by the Town
  - 100% of generated materials are landfilled at a C&D site in the region
- CBRM
  - 100% of incoming materials are landfilled at the CBRM C&D site
- Municipality of the District of Chester
  - 100% of incoming materials are landfilled at the Kaizer Meadow C&D site (quantities of ground wallboard received from VWRM and are stockpiled on the C&D landfill)
- Municipality of the County of Colchester
  - 100% of incoming materials are landfilled at the Colchester County C&D site
- Pictou County Solid Waste Management
  - 100% of materials are landfilled at the PCSWM C&D site

Material 5: HHW

- Source of Baseline Generated Waste Tonnage Info: FY2013 Data Call
- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 100% of collected amount removed for final offsite processing/disposal

Material 6: Mattresses and Box Springs

- Source of Baseline Generated Waste Tonnage Info: Otter Lake Landfill estimates, Halifax C&D Report, California Product Stewardship Council Report
- Assumption on Generation Rate:
  - All Municipalities/Authorities
    - 0.1 mattresses or box springs/person/year
- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 90% of the material generated is managed by the Municipality/Authority and landfilled
    - 10% are not received (including illegal dumping)

Material 7: Packaging and Printer Paper (PPP)

- Source of Baseline Generated Waste Tonnage Info: FY2013 Data Call
- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 100% of collected amount transferred to a processing facility/MRF (recycled)

Material 8: Textiles

- Source of Baseline Generated Waste Tonnage Info: Information provided by NSE from results of a waste audit and textile quantity data from Value Village and other charities
- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 19% of the material generated is collected through charities (diverted)
    - 81% trucked and disposed of at an MSW Landfill (landfilled)

Material 9: Tires (OTR)

- Source of Baseline Generated Waste Tonnage Info: RRFB Nova Scotia and Atlantic Tire Dealers Association, Tire Weight by Size, Farm & Industry, OTR & Forestry
- Assumption on Generation Rate:
  - All Municipalities/Authorities
    - 0.1% of tire stream are OTR tires
- Assumptions on Material Handling:
  - Town of Antigonish
    - Not applicable (not collected under municipal contracts)
  - CBRM
    - 50% are processed and disposed of in the C&D landfill (landfilled)
    - 50% are trucked and disposed of at the Guysborough Landfill (landfilled)
  - Municipality of the District of Chester
    - 100% are held on-site for unspecified future use (landfilled)
  - Municipality of the County of Colchester
    - 100% are held on-site for future diversion
  - Pictou County Solid Waste Management
    - 100% trucked and disposed of at the Guysborough Landfill (landfilled)

5.1.2 Proposed Conditions

Material 1: Asphalt Shingles

- Assumptions on Material Handling:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - All Remaining Municipalities/Authorities
    - 80% of the material generated will be received in segregated loads:
      - Segregated shingles will be processed offsite by a contractor hired by the Municipality/Authority (diverted)
    - 20% of the materials generated will be received in mixed C&D loads:
      - Shingles in mixed loads will be landfilled at the respective C&D site (landfilled)

Material 2: Carpet

- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 80% of the material generated will be received in segregated loads:
      - Segregated carpet will be collected and managed by an EPR program
    - 20% of the materials generated will be received in mixed C&D loads:
      - Carpet in mixed loads will be landfilled at the respective C&D site (landfilled)

Material 3: Clean Wood

- Assumptions on Material Handling:
  - Municipality of the District of Chester
    - 80% of incoming clean wood is processed and used as fuel at Brooklyn Energy
    - 80% of incoming dirty wood is processed to produce landfill cover
    - Acknowledges limited acceptance of mixed C&D loads at the Kaizer Meadow facility
    - Remainder of incoming materials are landfilled at the Kaizer Meadow C&D site
  - CBRM
    - 80% of incoming clean wood is processed to produce C&D LF cover
    - Remainder of incoming materials are landfilled at the CBRM C&D site
  - All Remaining Municipalities/Authorities
    - 60% of the material generated will be received in segregated loads:
      - Segregated clean wood will be processed onsite by the municipality or contractor (diverted)
    - 40% of the materials generated will be received in mixed C&D loads:
      - Clean wood in mixed loads will be landfilled at the respective C&D site (landfilled)

Material 4: Wallboard

- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 60% of the material generated will be received in segregated loads:
      - Segregated wallboard will be processed onsite by the municipality or contractor for use as an amendment at the nearest public-sector composting facility (diverted)
    - 40% of the materials generated will be received in mixed C&D loads:
      - Wallboard in mixed loads will be landfilled at the respective C&D site (landfilled)

Material 5: HHW

- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 100% of tonnages collected and managed by EPR program

Material 6: Mattresses and Box Springs

- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 90% of the material generated is collected and managed by EPR program
    - 10% are not received (including illegal dumping)

Material 7: Packaging and Printer Paper (PPP)

- Assumptions on Material Handling:
  - All Municipalities/Authorities, including “Option 1” for Municipality of the County of Colchester
    - Material collected and managed by EPR program

  - Assume overall costs are shared between the EPR program and the Municipality/Authority (see Section TBA)
  - Assume a 5% increase in total collected tonnage with an associated decrease in the amount of MSW requiring landfilling
- "Option 2" for the Municipality of the County of Colchester
  - Material collection covered through the EPR program
  - Assume incoming PPP tonnage/cost/revenue remains consistent with Existing Conditions forecast. Assume Colchester continues to serve as owner/operator of MRF using 2015 clients and associated user tip fees

Material 8: Textiles

- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - Diversion rate is expected to double from 19% to 38% with the implementation of the new programs
      - 38% of the material generated is collected and managed by Private Sector Programs
      - 62% trucked and disposed of at the respective landfill (landfilled)

Material 9: Tires (OTR)

- Assumptions on Material Handling:
  - All Municipalities/Authorities
    - 100% of tonnages collected and managed by the RRFB Nova Scotia

5.2 2016-2025 Material Quantity Forecast

For this study, projections of waste tonnage quantity were developed based on current waste tonnages, population data and waste generation rate forecasts. Waste generation quantities are closely linked to changes in population and economic activity.

Projected population growth information for each municipality for the 10-year study period was obtained from the percent change in population noted between the 2006 and 2011 Statistics Canada censuses. The population of serviced areas was used for forecasting population projections. For example, since CBRM accepts PPP from CBRM, Richmond County, the Town of Port Hawkesbury, Eskasoni and Membertou, the population of all five municipal units was used to forecast future PPP tonnages that CBRM will manage. The percentage population change for each municipality for each material is presented in Tables 5-1 to 5-5. An annual per capita waste generation rate increase of 1% was chosen for this study as it is consistent with reported trends within North America.

The baseline managed waste characterization for the year 2012 was projected by forecasted population growth and waste generation rate growth to the starting point of this study, 2016. Founded on the information presented in the preceding sections, Tables 5-1 to 5-5 present the waste generation forecast for the total amount of the nine materials managed by the five municipalities included in this study. For presentation purposes, values for 2016, 2020 and 2025 are presented and more detailed estimates are provided in Appendix A1 (Town of Antigonish), A2 (CBRM), A3 (District of Chester), A4 (Colchester County) and A5 (PCSWM). These tables serve as the foundation for the forecasting of quantities of the nine materials.

Table 5-1
Municipal Financial Impact Review - TOWN OF ANTIGONISH
Waste Managed by the Town of Antigonish - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[2]	% change in Population	Material		2016		2020		2025	
					Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Town of Antigonish	4,586	1.36%	1	Asphalt Shingles	0.0	0	0.0	0	0.0	0
			2	Carpet	0.0	0	0.0	0	0.0	0
			3	Clean Wood	0.0	0	0.0	0	0.0	0
			4	Wallboard	0.0	0	0.0	0	0.0	0
			5	HHW	0.5	2	0.5	3	0.6	3
			6A	PP&P - Current	81.0	392	89.0	455	100.1	547
			6B	PP&P - Proposed[1]	85	412	93	478	105	574
			7	Mattresses/Boxsprings	2.0	10	2.3	11	2.5	14
			8A	Textiles - Current	17.1	83	18.7	96	21.1	115
			8B	Textiles - Proposed[2]	13.8	67	15.2	78	17.1	93
			9	Tires (new)	0.06	0.26	0.06	0.28	0.07	0.32
			10	Cost Savings from Landfilling Less Waste	4.1	20	4.5	23	5.0	27

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

Table 5-2
Municipal Financial Impact Review - CBRM
Waste Managed by CBRM - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[3]	% change in Population	Material		2016		2020		2025	
					Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Cape Breton Regional Municipality	96,482	-0.94%	1	Asphalt Shingles	19.8	1,840	19.8	1,776	19.9	1,698
			2	Carpet	11.3	1,052	11.4	1,016	11.4	971
			3	Clean Wood	115.8	10,758	116.0	10,381	116.3	9,927
			4	Wallboard	14.8	1,374	14.8	1,325	14.9	1,267
			5	HHW	0.2	19	0.2	19	0.2	18
	112,889	-0.79%	6A	PP&P - Current	78.1	7,255	78.7	7,042	79.5	6,785
			6B	PP&P - Proposed[1]	82	7,618	83	7,394	83	7,124
	96,482	-0.94%	7	Mattresses/Boxsprings	3.7	340	3.7	328	3.7	313
			8A	Textiles - Current	37.8	3,511	37.9	3,388	38.0	3,240
			8B	Textiles - Proposed[2]	30.6	2,844	30.7	2,744	30.8	2,624
			9	Tires (new)	0.1	12	0.1	11	0.1	11
			10	Savings from disposing less waste	3.9	363	3.9	352	4.0	339

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

[3] CBRM MRF accepts PPP from Richmond County, Port Hawksbury, Eskasoni and Membertou

Table 5-3
Municipal Financial Impact Review - CHESTER
Waste Managed by Chester - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1.00%

Municipal Unit	Estimated 2012 Population[3]	% change in Population	Material	2016		2020		2025	
				Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Chester	10,571	-0.26%	1 Asphalt Shingles	66.6	697	68.6	711	71.2	728
			2 Carpet	98.2	1,028	101.2	1,048	105.0	1,073
			3 Clean Wood	182.8	1,913	188.3	1,949	195.3	1,996
			4 Wallboard	58.9	617	60.7	629	63.0	644
			5 HHW	3.9	41	4.0	42	4.2	43
			6A PP&P - Current	93.9	982	96.7	1,001	100.3	1,025
			6B PP&P - Proposed[1]	99	1,031	102	1,051	105	1,076
	112,234	-0.11%	7 Mattresses/Boxsprings	3.3	372	3.4	381	3.6	393
			8A Textiles - Current	34.5	3,855	35.5	3,954	36.9	4,081
			8B Textiles - Proposed[2]	27.9	3,123	28.8	3,203	29.9	3,306
			9 Tires (OTR)	0.2	18	0.2	18	0.2	19
			10 Savings from disposing less waste		49		50		51

Notes:

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

[2] Chester accepts waste (e.g. mattresses, textiles, etc.) from the Municipality of the District of Lunenburg, the Towns of Lunenburg, Bridgewater and Mahone Bay, Annapolis County and Kings County

Table 5-4
Municipal Financial Impact Review - COLCHESTER
Waste Managed by Colchester - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[3]	% change in Population		Material	2016		2020		2025	
					Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Colchester	50,285	0.33%	1	Asphalt Shingles	9.0	457	9.5	488	10.1	530
			2	Carpet	12.9	655	13.6	700	14.5	760
			3	Clean Wood	28.7	1,461	30.2	1,560	32.3	1,694
			4	Wallboard	9.2	471	9.7	503	10.4	546
			5	HHW	0.4	21	0.4	23	0.5	25
	50,285	0.33%	6B-1	PP&P - Proposed (Option 1)	56.9	3,042	59.9	3,249	64.0	3,528
	125,645	0.01%	6A	PP&P - Current	77.1	9,699	80.3	10,113	84.5	10,665
			6B-2	PP&P - Proposed[1] (Option 2)	81	10,184	84	10,619	89	11,198
	50,285	0.33%	7	Mattresses/Boxsprings	2.5	128	2.6	137	2.8	148
			8A	Textiles - Current	45.5	2,319	48.0	2,477	51.3	2,690
			8B	Textiles - Proposed[2]	36.9	1,878	38.9	2,006	41.5	2,179
			9	Tires (OTR)	0.2	8	0.2	9	0.2	10
			10	Cost Savings from Landfilling Less Waste	3.9	485	4.0	506	4.2	533

Notes:

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

[3] Colchester's MRF accepts PPP from the Towns of Antigonish, Windsor and Mulgrave, Antigonish County, District of Saint Mary's, Guysborough County and PCSWM

Table 5-5
Municipal Financial Impact Review - PCSWM
Waste Managed by PCSWM - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[2]	% change in Population	Material	2016		2020		2025	
				Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Pictou County	44,998	-0.39%	1 Asphalt Shingles	7.2	320	7.4	322	7.6	326
			2 Carpet	13.1	579	13.4	584	13.8	590
			3 Clean Wood	22.5	998	23.1	1,006	23.8	1,016
			4 Wallboard	6.8	301	7.0	303	7.2	306
			5 HHW	0.2	10	0.2	10	0.2	10
			6A PP&P - Current	61.7	2,731	63.2	2,753	65.1	2,782
			6B PP&P - Proposed[1]	65	2,868	66	2,891	68	2,921
			7 Mattresses	2.2	97	2.2	98	2.3	99
			8A Textiles - Current	33.3	1,477	34.1	1,489	35.2	1,504
			8B Textiles - Proposed[2]	27.0	1,196	27.7	1,206	28.5	1,218
			9 Tires (new)	0.1	4	0.1	4	0.1	4
			10 Cost Savings from Landfilling Less Waste		137		138		139

[1] 5% more PP&P collected under the Proposed Conditions Scenario
[2] 19% less textiles collected under the Proposed Conditions Scenario

6.0 Cost of Service Forecast

This section provides an overview of the methods and assumptions employed to estimate the net benefit of the Current Conditions and Proposed Conditions scenarios.

6.1 Assumptions

The sources of information and assumptions used to create the baseline operating costs, revenue and net benefit for the nine materials in the Current Conditions scenario are presented in Section 6.1.1. The assumptions used to determine the incremental capital costs, operating costs, revenues and net benefit of the Proposed Conditions scenario are presented in Section 6.1.2.

Current amortized capital costs were not included in the baseline costing analysis for the Current Conditions scenario since current capital costs are relevant to both scenarios. The costing analysis only includes incremental capital costs borne in the Proposed Conditions scenario.

6.1.1 Current Conditions

The baseline operating costs for 2012 for the nine materials was created based on the operating costs reported in the FY2013 Data Call. Operating costs were allocated proportionally to the materials based on the percentage composition of that material in the waste stream. For the C&D materials, an allowance of $5/tonne for future closure/capping requirements of a municipally-owned C&D landfill was added to the operating costs, where applicable, if not previously identified in the Data Call.

Current tip fees, multiplied by tonnes of material managed, was used to determine the baseline revenue for each material.

The net benefit per tonne is simply the revenue per tonne minus the operating costs per tonne.

A summary table of the baseline operating costs, revenues and net benefit for the Current Conditions scenario for each of the five participating municipalities/authorities is presented in Appendices B1 through B5.

6.1.2 Proposed Conditions

New capital cost items and operating requirements are required for the C&D materials that will be managed by the respective Municipalities/Authorities under the Proposed Conditions scenario. The materials include asphalt shingles, clean wood and wallboard. New capital cost items include a C&D laydown area and a small quantity C&D public drop-off area. New capital and operating costs are proportionally allocated to shingles, clean wood and wallboard.

Assumptions for operating costs, incremental capital costs, and revenues for each material under the Proposed Conditions scenario are presented below.

Additional effort for municipal enforcement of current provincial littering and open burning regulations will be required under the Proposed Conditions scenario. Based on data provided by NSE, the estimated additional annual enforcement cost for each municipality is presented in Appendix B7. The costs were included in the overall system NPV analysis presented in Section 6.2.

Material 1: Asphalt Shingles

- Assumptions on Incremental Operating Costs:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - CBRM
    - Transported and processed offsite by Halifax C&D (Milford) at a rate of $71/tonne
    - No additional site personnel time over existing
  - Municipality of the District of Chester
    - Transported and processed offsite by Halifax C&D (Milford) at a rate of $51/tonne
    - No additional site personnel time over existing
  - Municipality of the County of Colchester
    - Transported and processed offsite by Halifax C&D (Milford) at a rate of $46/tonne
    - No additional site personnel time over existing
  - Pictou County Solid Waste Management
    - Transported and processed offsite by Halifax C&D (Milford) at a rate of $49/tonne
    - Proportional allocation of new full time PCSWM C&D site operator

- Assumptions on Incremental Capital Costs:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - All Municipalities/Authorities
    - Proportional allocation of the amortized cost of the new C&D laydown area and small quantity C&D drop-off

- Assumptions on Revenues:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - CBRM
    - 80% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - An incentivized tip fee of $40/tonne will be collected by the Municipality
    - 20% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $80/tonne will be collected by the Municipality
  - Municipality of the District of Chester
    - 80% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - An incentivized tip fee of $35/tonne will be collected by the Municipality
    - 20% of the materials generated will be received in mixed C&D loads and landfilled
    - Tip fee of $70/tonne will be collected by the Municipality
  - Municipality of the County of Colchester
    - 80% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - An incentivized tip fee of $30/tonne will be collected by the Municipality
    - 20% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $95/tonne will be collected by the Municipality
      - Tip fee of $112/tonne will be collected for C&D materials mixed with garbage

  - Pictou County Solid Waste Management
    - 80% of the material generated will be received in segregated loads and processed onsite by the Authority
      - An incentivized tip fee of $50/tonne will be collected by the Authority
    - 20% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $90/tonne will be collected by the Authority

Material 2: Carpet

- Assumptions on Incremental Operating Costs:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - All Remaining Municipalities/Authorities
    - 80% of the material generated will be received in segregated loads
      - Costs borne by EPR Program
    - 20% of the materials generated will be received in mixed C&D loads
      - Baseline operating cost to landfill carpet

- Assumptions on Incremental Capital Costs:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - All Remaining Municipalities/Authorities
    - None to the Municipality/Authority
    - Capital costs associated with expansion of public drop off structure to be covered by EPR program

- Assumptions on Revenues:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - All Remaining Municipalities/Authorities
    - 80% of the material generated will be received in segregated loads and managed by EPR Program
      - None to the Municipality/Authority
    - 20% of the materials generated will be received in mixed C&D loads and landfilled by the Municipality/Authority
      - Tip fee of $80/tonne will be collected by CBRM
      - Tip fee of $70/tonne will be collected by District of Chester
      - Tip fee of $95/tonne will be collected by the County of Colchester
      - Tip fee of $90/tonne will be collected by PCSWM

Material 3: Clean Wood

- Assumptions on Incremental Operating Costs:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - CBRM
    - Assume a 20% increase over current annual wood processing costs

  - Municipality of the District of Chester
    - Assume no change to current annual wood processing costs
  - Municipality of the County of Colchester
    - Assume a 20% increase over current annual wood processing costs
  - Pictou County Solid Waste Management
    - Processed onsite for 40 hours/year at a rate of $300/hour
    - Proportional allocation of a full time C&D site operator

- Assumptions on Incremental Capital Costs:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - All Remaining Municipalities/Authorities
    - Proportional allocation of the amortized cost of the new C&D laydown area and small quantity C&D drop-off

- Assumptions on Revenues:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - CBRM
    - 60% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - An incentivized tip fee of $40/tonne will be collected by the Municipality
    - 40% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $80/tonne will be collected by the Municipality
  - Municipality of the District of Chester
    - 80% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - An incentivized tip fee of $35/tonne will be collected by the Municipality
    - 20% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $70/tonne will be collected by the Municipality
  - Municipality of the County of Colchester
    - 60% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - An incentivized tip fee of $30/tonne will be collected by the Municipality
    - 40% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $95/tonne will be collected by the Municipality
      - Tip fee of $112/tonne will be collected for C&D materials mixed with garbage
  - Pictou County Solid Waste Management
    - 60% of the material generated will be received in segregated loads and processed onsite by the Municipality/Authority:
      - A reduced tip fee of $50/tonne will be collected by the Authority
    - 40% of the materials generated will be received in mixed C&D loads and landfilled:
      - Tip fee of $90/tonne will be collected by the Authority

Material 4: Wallboard

- Assumptions on Incremental Operating Costs:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - CBRM
    - Processed on site for use at PCSWM Composting Facility with a processing allowance of $5000/year
  - Municipality of the District of Chester
    - Processed on site for use at Whynott's Settlement Composting Facility with a processing and trucking allowance of $2500/year
  - Municipality of the County of Colchester
    - Processed on site for use at Colchester Composting Facility with a processing allowance of $7000/year
  - Pictou County Solid Waste Management
    - Processed on site for use at PCSWM Composting Facility with a processing allowance of $5000/year
    - Proportional allocation of a new full time C&D site operator

- Assumptions on Incremental Capital Costs:
  - All Municipalities/Authorities
    - Proportional allocation of the amortized cost of the new C&D laydown area and small quantity C&D drop-off

- Assumptions on Revenues:
  - Town of Antigonish
    - No direct C&D material services are coordinated/provided by the Town
  - CBRM
    - 60% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - A reduced tip fee of $50/tonne will be collected by the Municipality/Authority
    - 40% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $90/tonne will be collected by the Municipality
  - Municipality of the District of Chester
    - 60% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - An incentivized tip fee of $35/tonne will be collected by the Municipality
    - 40% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $70/tonne will be collected by the Municipality
  - Municipality of the County of Colchester
    - 60% of the material generated will be received in segregated loads and processed onsite by the Municipality
      - An incentivized tip fee of $30/tonne will be collected by the Municipality
    - 40% of the materials generated will be received in mixed C&D loads and landfilled
      - Tip fee of $95/tonne will be collected by the Municipality
      - Tip fee of $112/tonne will be collected for C&D materials mixed with garbage
  - Pictou County Solid Waste Management
    - 60% of the material generated will be received in segregated loads and processed onsite by the Authority:

  - A reduced tip fee of $50/tonne will be collected by the Authority
- 40% of the materials generated will be received in mixed C&D loads and landfilled: Tip fee of $90/tonne will be collected by the Authority

Material 5: HHW

- Assumptions on Incremental Operating Costs:
  - All Municipalities/Authorities
    - 80% of costs borne by EPR Program
    - 20% of costs borne by the Municipality/Authority

- Assumptions on Incremental Capital Costs:
  - All Municipalities/Authorities
    - 80% of costs borne by EPR Program
    - 20% of costs borne by the Municipality/Authority

- Assumptions on Revenues:
  - All Municipalities/Authorities
    - None to the Municipality/Authority

Material 6: Mattresses and Box Springs

- Assumptions of Incremental Operating Costs:
  - All Municipalities/Authorities
    - None to the Municipality/Authority
    - Costs borne by EPR Program

- Assumptions on Incremental Capital Costs:
  - All Municipalities/Authorities
    - None to the Municipality/Authority
    - Capital costs associated with expansion of public drop off structure to be borne by EPR program

- Assumptions on Revenues:
  - All Municipalities/Authorities
    - None to the Municipality/Authority

Material 7: Packaging and Printer Paper (PPP)

- Assumptions on Incremental Operating Costs:
  - All Municipalities/Authorities, including “Option 1” for Municipality of the County of Colchester
    - Assume a sharing of overall net costs to acknowledge uncertainties related to the EPR agreement
      - 70% of costs will be borne by the EPR Program
      - 30% of costs will be borne by the Municipality/Authority

  - "Option 2" for the Municipality of the County of Colchester
    - Assume County residential collection services are provided as a component of the EPR agreement
    - Assume incoming PPP tonnage remains consistent with Existing Conditions forecast
    - Use the current MRF per tonne operating cost as a basis for future financial forecasting

- Assumptions on Incremental Capital Costs:
  - All Municipalities/Authorities, including "Option 1" for Municipality of the County of Colchester
    - None
  - "Option 2" for the Municipality of the County of Colchester
    - Identify key Colchester MRF capital replacement expenditures for the 10 year study period

- Assumptions on Revenues:
  - CBRM and "Option 1" for Municipality of the County of Colchester
    - Assume a building and equipment value for the sale of the existing municipal MRFs at the beginning of the 10 year study period
  - All Remaining Municipalities/Authorities
    - None
  - "Option 2" for the Municipality of the County of Colchester
    - Use the current MRF per tonne revenue value as a basis for future financial forecasting

Material 8: Textiles

- Assumptions on Incremental Operating Costs:
  - All Municipalities/Authorities
    - 38% of the material that is diverted through Private Sector Programs
      - None to the Municipality/Authority
      - Costs borne by Private Sector Programs
    - 62% of the materials that is landfilled
    - Baseline landfilling costs to the Municipality/Authority

- Assumptions on Incremental Capital Costs:
  - All Municipalities/Authorities
    - None to the Municipality/Authority
    - Costs borne by Private Sector Programs

- Assumptions on Revenues:
  - All Municipalities/Authorities
    - 38% of the material that is diverted through Private Sector Programs
      - None to the Municipality/Authority
    - 62% of the materials that is landfilled
      - Standard waste tip fee to the Municipality/Authority

Material 9: Tires (OTR)

- Assumptions on Incremental Operating Costs:
  - All Municipalities/Authorities
    - None to the Municipality/Authority
    - Costs borne by EPR Program

- Assumptions on Incremental Capital Costs:
  - All Municipalities/Authorities
    - None to the Municipality/Authority
    - Costs borne by EPR Program

- Assumptions on Revenues:
  - All Municipalities/Authorities
    - None to the Municipality/Authority

A detailed summary of new operating and capital costs is presented in Appendix B.

6.2 Net Present Value Forecast

The net benefit is a measure of the present value of the revenue from tipping fees minus all capital and operating costs over a 10-year period for each scenario. If the net benefit is positive, the scenario is economically beneficial to implement, where the tipping fees (benefits) are greater than scenario capital and operating costs.

The scenario benefits are calculated as the tipping fees per tonne for each type of waste multiplied by the projected tonnes of waste managed over the 10-year period.

There are two cost items included in the analysis:

- Capital costs are one time capital purchases for equipment. These costs are added to the scenario as an annual capital cost, using the capital recovery factor equation provided in Table 6-1.
- Annual operating and maintenance (O&M) costs occur over the 10-year time period.

Consistent with public project economic analysis, financing costs are not included in this evaluation. A discount rate of 5% is used however to reflect the time value of money, expressing future costs in 2015 dollars (see Table 6-1 below). Similarly, inflation is not included in the analysis, and therefore no consumer price index is applied to future tipping fees.

The main indicator developed is the net benefit, which is a measure of the present value of the benefits of the scenario (tipping fees) minus the present value of the scenario costs (capital and operating). A value greater than zero indicates the scenario is economically desirable. The present value of the net benefit is calculated from the stream of future benefits less scenario costs discounted back to 2015 from the year in which they accrue. Table 6-1 provides the method and assumptions used to calculate the net benefit in present value terms.

There are three other indicators provided in Tables 6-2 to 6-6:

- Waste managed is the cumulative waste managed in tonnes for each scenario.
- The net benefit per tonne is simply the net present value divided by the waste managed.

The annualized cost takes the net benefit (present value of benefits minus costs) over the 10-year year timeframe and breaks it down into equal annual increments. Tables 6-2 to 6-6 provide the Equivalent Annual Cost (EAC) equation used.

TABLE 6-1: SUMMARY OF PARAMETERS USED IN THE NPV ANALYSIS

Parameter	Description	Value
Analysis Time Period	The timeframe in which the appraisal is conducted.	10 years: 2016 to 2025
Base Year	The year in which the expenditures are anticipated.	2015 prices
Discount Rate for NPV Calculation	The discount rate brings streams of costs and benefits back to the base year (2014). $\mathrm{NPV}(i,N)=\sum_{t=0}^{N}\frac{R_t}{(1+i)^t}$, where t is the years and r is the discount rate	r = 5% discount rate t = 10 years
Equivalent Annual Cost (EAC)	Converts a present value of the total capital and operating costs into an annual cost over the specified time period, at a specified discount rate: $EAC=\frac{NPV}{A_{t,r}}$, where *A* is expressed as $\frac{1-1/(1+r)^y}{r}$, where r is the discount rate and y are the years.	r = 5% discount rate y = 10 years
Capital Recovery Factor	The CRF is used to annualize the capital costs in equal proportion over the 10 year timeframe. The equation is: $CRF=\frac{r(1+r)^y}{(1+r)^y-1}$	r = 5% discount rate y = 10 years

A summary of annual net benefit per scenario is presented in Tables 6-2 to 6-6 for the five Municipalities. For each type of waste managed, the scenario with the higher (or less negative) dollar value is more desirable. Across all waste streams managed, the Proposed Conditions scenario is more economically desirable. This is not the case for some individual waste streams, with significant variation in the net benefit between the different types of managed waste.

6.2.1 Town of Antigonish

A summary of annual net benefit per scenario for the Town of Antigonish is presented in Table 6-2. Across all waste streams managed, the Proposed Conditions scenario is more economically desirable with an annual net benefit of -$58,400 relative to -$200,860 for the Current Conditions scenario.

TABLE 6-2: SUMMARY OF ANNUAL NET BENEFIT PER SCENARIO (TOWN OF ANTIGONISH)

Material	Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)
			Waste Managed	Net Benefit/tonne	
Asphalt Shingles	Current Conditions	$0	0	-	$0
	Proposed Conditions	$0	0	-	$0
Carpet	Current Conditions	$0	0	-	$0
	Proposed Conditions	$0	0	-	$0

Material	Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)
			Waste Managed	Net Benefit/tonne	
Clean Wood	Current Conditions	$0	0	-	$0
	Proposed Conditions	$0	0	-	$0
Wallboard	Current Conditions	$0	0	-	$0
	Proposed Conditions	$0	0	-	$0
HHW	Current Conditions	-$7,000	27	-$259	-$910
	Proposed Conditions	-$1,000	27	-$37	-$130
PPP	Current Conditions	-$1,384,000	4,658	-$297	-$179,230
	Proposed Conditions	-$376,000	4,891	-$77	-$48,690
Mattresses	Current Conditions	-$20,000	117	-$171	-$2,590
	Proposed Conditions	$0	117	$0	$0
Textiles	Current Conditions	-$139,000	981	-$142	-$18,000
	Proposed Conditions	-$113,000	795	-$142	-$14,630
Tires (new)	Current Conditions	-$1,000	3	-$348	-$130
	Proposed Conditions	$0	3	$0	$0
Cost Savings from Landfilling Less Waste*	Proposed Conditions	$41,000	233	$176	$5,310
Additional littering-open burning enforcement effort	Proposed Conditions	-$2,000	-	-	-$260
Total	Current Conditions	-$1,551,000	5,786	-$268	-$200,860
	Proposed Conditions	-$451,000	5,833	-$77	-$58,400

Notes:

** 5% more PPP will be recovered in the Proposed Conditions Scenario. Cost savings will be realized from an associated decrease in the amount of MSW requiring landfilling.*

*** Net Benefits (Revenue – Costs) presented are high level figures for planning purposes only. Costs are not inclusive of all relevant cost items (e.g., current amortized capital costs are not included).*

6.2.2 CBRM

A summary of annual net benefit per scenario for CBRM is presented in Table 6-3. Across all waste streams managed, the Proposed Conditions scenario is more economically desirable with the net benefit of -$1,055,000 relative to -$2,418,000 for the Current Conditions scenario. This is not the case for the individual waste streams, with significant variation in the net benefit between the different types of managed waste.

TABLE 6-3: SUMMARY OF ANNUAL NET BENEFIT PER SCENARIO (CBRM)

Material	Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)
			Waste Managed	Net Benefit/tonne	
Asphalt Shingles	Current Conditions	-$337,000	17,684	-$19	-$44,000
	Proposed Conditions	-$480,000	17,684	-$27	-$69,000
Carpet	Current Conditions	-$160,000	10,114	-$16	-$21,000
	Proposed Conditions	$15,400	10,114	$2	$2,000
Clean Wood	Current Conditions	$854,000	103,378	$8	$111,000
	Proposed Conditions	$494,000	103,378	$5	$47,000
Wallboard	Current Conditions	-$247,000	13,198	-$19	-$32,000
	Proposed Conditions	$108,000	13,198	$8	$12,000
HHW	Current Conditions	-$184,000	185	-$995	-$24,000
	Proposed Conditions	-$37,000	185	-$200	-$5,000
PPP	Current Conditions	-$13,769,000	70,173	-$196	-$1,783,000
	Proposed Conditions	-$6,248,000	73,682	-$85	-$809,000
Sale of the MRF		$1,333,000	-	-	$173,000
Mattresses	Current Conditions	-$423,000	3,265	-$130	-$55,000
	Proposed Conditions	$0	3,265	$0	$0
Textiles	Current Conditions	-$4,387,000	33,739	-$130	-$568,000
	Proposed Conditions	-$3,553,000	27,329	-$130	-$460,000
Tires (new)	Current Conditions	-$15,000	112	-$134	-$2,000
	Proposed Conditions	$0	112	$0	$0
Cost Savings from Landfilling Less Waste*	Proposed Conditions	$456,000	-	-	$59,000
Additional littering-open burning enforcement effort	Proposed Conditions	-$40,000	-	-	-$5,000
Total	Current Conditions	-$18,668,000	251,848	-$74	-$2,418,000
	Proposed Conditions	-$8,147,600	248,946	-$33	-$1,055,000

Notes:

**5% more PPP will be recovered in the Proposed Conditions Scenario. Cost savings will be realized from an associated decrease in the amount of MSW requiring landfilling.*

** *Net Benefits (Revenue – Costs) presented are high level figures for planning purposes only. Costs are not inclusive of all relevant cost items (e.g., current amortized capital costs are not included).*

6.2.3 Municipality of the District of Chester

A summary of annual net benefit per scenario for the Municipality of the District of Chester is presented in Table 6-4. Across all waste streams managed, the Proposed Conditions scenario is more economically desirable with the annual net benefit of -$173,480 relative to -$299,600 for the Current Conditions scenario. This is not the case for the individual waste streams, with significant variation in the net benefit between the different types of managed waste.

TABLE 6-4: SUMMARY OF ANNUAL NET BENEFIT PER SCENARIO (CHESTER)

Material	Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)
			Waste Managed	Net Benefit/tonne	
Asphalt Shingles	Current Conditions	$124,000	7,123	$17	$16,000
	Proposed Conditions	-$70,000	7,123	-$10	-$9,000
Carpet	Current Conditions	$275,000	10,505	$26	$36,000
	Proposed Conditions	$73,000	10,505	$7	$9,000
Clean Wood	Current Conditions	$316,000	19,542	$16	$41,000
	Proposed Conditions	$113,000	19,542	$6	$15,000
Wallboard	Current Conditions	$219,000	6,305	$35	$28,000
	Proposed Conditions	$18,000	6,305	$3	$2,000
HHW	Current Conditions	-$172,000	417	-$412	-$22,000
	Proposed Conditions	-$34,000	417	-$82	-$4,000
PPP	Current Conditions	-$1,896,000	10,033	-$189	-$246,000
	Proposed Conditions	-$569,000	10,535	-$54	-$74,000
Mattresses	Current Conditions	-$80,000	3,823	-$21	-$10,000
	Proposed Conditions	$0	3,823	$0	$0
Textiles	Current Conditions	-$1,097,000	39,671	-$28	-$142,000
	Proposed Conditions	-$889,000	32,134	-$28	-$115,000
Tires (new)	Current Conditions	-$5,000	181	-$28	-$600
	Proposed Conditions	$0	181	$0	$0
Cost Savings from Landfilling Less Waste*	Proposed Conditions	$14,000	-	-	$2,000
Additional littering-open burning enforcement effort	Proposed Conditions	$4,000	-	-	$520
Total	Current Conditions	-$2,316,000	97,600	-$24	-$299,600
	Proposed Conditions	-$1,340,000	90,564	-$15	-$173,480

Notes:
**5% more PPP will be recovered in the Proposed Conditions Scenario. Cost savings will be realized from an associated decrease in the amount of MSW requiring landfilling.*
** *Net Benefits (Revenue – Costs) presented are high level figures for planning purposes only. Costs are not inclusive of all relevant cost items (e.g., current amortized capital costs are not included).*

6.2.4 Municipality of the County of Colchester

A summary of annual net benefit per scenario for the Municipality of the County of Colchester for Option 1 and Option 2 for PPP is presented in Table 6-5. Across all waste streams managed, the Proposed Conditions scenario (both Option 1 and Option 2) is more economically desirable with the net benefit of -$375,720 (Option 1) and -$384,720 (Option 2) relative to -$904,520 for the Current Conditions scenario. This is not the case for the individual waste streams, with significant variation in the net benefit between the different types of managed waste.

TABLE 6-5: SUMMARY OF ANNUAL NET BENEFIT PER SCENARIO (COLCHESTER)

Material	Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)
			Waste Managed	Net Benefit/tonne	
Asphalt Shingles	Current Conditions	$269,000	4,930	$55	$35,000
	Proposed Conditions	-$162,000	4,930	-$33	-$16,000
Carpet	Current Conditions	$385,000	7,063	$55	$50,000
	Proposed Conditions	-$44,000	7,063	-$6	-$6,000
Clean Wood	Current Conditions	-$144,000	15,748	-$9	-$19,000
	Proposed Conditions	-$758,000	15,748	-$48	-$81,000
Wallboard	Current Conditions	$277,000	5,078	$55	$36,000
	Proposed Conditions	-$76,000	5,078	-$15	-$6,000
HHW	Current Conditions	-$111,000	230	-$483	-$14,000
	Proposed Conditions	$0	230	$0	$0
PPP	Current Conditions	-$6,468,000	101,729	-$64	-$838,000
PPP (OPTION 1)**	Proposed Conditions	-$2,444,000	31,232	-$78	-$317,000
Sale of the MRF (OPTION 1)		$1,524,000			$197,000
PPP (OPTION 2)	Proposed Conditions	-$1,227,000	106,815	-$11	-$159,000
Mattresses	Current Conditions	-$62,000	1,379	-$45	-$8,000
	Proposed Conditions	$0	1,379	$0	$0
Textiles	Current Conditions	-$1,129,000	25,002	-$45	-$146,000
	Proposed Conditions	-$914,000	20,252	-$45	-$118,000
Tires (new)	Current Conditions	-$4,000	91	-$44	-$520
	Proposed Conditions	$0	91	$0	$0

Material	Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)
			Waste Managed	Net Benefit/tonne	
Cost Savings from Landfilling Less Waste*	Proposed Conditions	$230,000	-	-	$30,000
Additional littering-open burning enforcement effort	Proposed Conditions	-$21,000	-	-	-$2,720
Total	Current Conditions	-$6,987,000	161,250	-$43	-$909,520
	Proposed Conditions (Option 1)	-$2,895,000	86,003	-$34	-$375,720
Total	Current Conditions	-$6,987,000	161,250	-$43	-$909,520
	Proposed Conditions (Option 2)	-$2,972,000	161,586	-$18	-$384,720

Notes:
**5% more PPP will be recovered in the Proposed Conditions Scenario. Cost savings will be realized from an associated decrease in the amount of MSW requiring landfilling.*
*** Net Benefits (Revenue – Costs) presented are high level figures for planning purposes only. Costs are not inclusive of all relevant cost items (e.g., current amortized capital costs are not included).*

6.2.5 Pictou County Solid Waste Management (PCSWM)

A summary of annual net benefit per scenario for PCSWM is presented in Table 6-6. Across all waste streams managed, the Proposed Conditions scenario is more economically desirable with the annual net benefit of -$468,000 relative to -$702,520 for the Current Conditions scenario. This is not the case for the individual waste streams, with significant variation in the net benefit between the different types of managed waste.

TABLE 6-6: SUMMARY OF ANNUAL NET BENEFIT PER SCENARIO (PCSWM)

Material	Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)
			Waste Managed	Net Benefit/tonne	
Asphalt Shingles	Current Conditions	$164,000	3,227	$51	$21,000
	Proposed Conditions	-$153,000	3,227	-$47	-$20,000
Carpet	Current Conditions	$298,000	5,846	$51	$39,000
	Proposed Conditions	$65,000	5,846	$11	$8,000
Clean Wood	Current Conditions	$513,000	10,070	$51	$66,000
	Proposed Conditions	-$174,000	10,070	-$17	-$23,000
Wallboard	Current Conditions	$155,000	3,035	$51	$20,000
	Proposed Conditions	-$89,000	3,035	-$29	-$12,000

Material	Scenario	Net Benefit (NPV @5%; 10 years)	Total over 10 years		Annual Net Benefit (net benefit annualized)
			Waste Managed	Net Benefit/tonne	
HHW	Current Conditions	-$157,000	100	-$1,570	-$20,000
	Proposed Conditions	-$31,000	100	-$310	-$4,000
PPP	Current Conditions	-$5,158,000	27,562	-$187	-$668,000
	Proposed Conditions	-$2,415,000	28,940	-$83	-$313,000
Mattresses	Current Conditions	-$98,000	981	-$100	-$13,000
	Proposed Conditions	$0	981	$0	$0
Textiles	Current Conditions	-$1,133,000	14,905	-$76	-$147,000
	Proposed Conditions	-$918,000	12,073	-$76	-$119,000
Tires (new)	Current Conditions	-$4,000	40	-$100	-$520
	Proposed Conditions	$0	40	$0	$0
Cost Savings from Landfilling Less Waste*	Proposed Conditions	$129,000	-	-	$17,000
Additional littering-open burning enforcement effort	Proposed Conditions	-$19,000	-	-	-$2,000
Total	Current Conditions	-$5,420,000	65,766	-$82	-$702,520
	Proposed Conditions	-$3,605,000	64,312	-$56	-$468,000

Notes:
** 5% more PPP will be recovered in the Proposed Conditions Scenario. Cost savings will be realized from an associated decrease in the amount of MSW requiring landfilling.*

*** Net Benefits (Revenue – Costs) presented are high level figures for planning purposes only. Costs are not inclusive of all relevant cost items (e.g., current amortized capital costs are not included).*

7.0 Summary of Findings

As presented in Section 6, in comparison to current procedures and with a focus on the period of 2016 to 2025, the implementation of the new waste diversion activities under the Proposed Conditions scenario is forecasted to result in a reduction of costs over current expenditure for all five municipalities/authorities that participated in this study. It is acknowledged that a key assumption supporting this finding is that costs associated with the full operation of the curbside blue bag program within the each of the five evaluated municipalities/authorities will be addressed through a proposed Printed Paper and Packaging (PPP) Extended Producer Responsibility (EPR) program.

The completion of this assessment, with regards to the Municipality of Colchester, included the consideration of a variation on the PPP EPR option. Unlike the assumed "default" PPP alternative (with the EPR stewards assuming responsibility for all aspects of a municipality's curbside bluebag program), Colchester County requested that a second option be considered that assumed that they continued to own and operate its Kemptown MRF, serving its existing clientele consistent with current tip fee and tonnage forecasts.

As illustrated in Tables 6-2 to 6-6, the anticipated establishment of EPR or private sector-led programs (e.g., HHW, mattresses/box springs, carpet, textiles) for other materials will also contribute to the positive financial projection. For these programs, it has also been assumed that all diversion costs will be covered by industry stewards.

Clearly, the details of the finalized EPR agreements, particularly for PPP, will have a significant impact on the actual financial desirability of the proposed diversion program changes for the five municipalities/authorities that participated in this study.

As anticipated, based on a noted gap between tipping fees and reported NSE FY2013 Data Call disposal costs, the existing management of C&D materials serves as a revenue generation source for the four study participants that offer C&D management services. Even with an allowance added to reported disposal costs to address future capping/closure requirements for the on-site C&D material landfill (where required), the acceptance of C&D currently generates (on a NPV basis) between $14,000 and $146,000 of revenue per year, depending on the municipality. Acknowledging the additional costs (versus landfilling) to appropriately divert the targeted C&D materials, this positive revenue stream is forecasted to be significantly reduced under the "Proposed Conditions" scenario. But, as described above, this C&D stream revenue decline is relatively minor in comparison to the positive contribution forecasted with the establishment of a PPP EPR program.

With regard to C&D materials, and considering HRM as an example, it is noted that the potential exists (ultimately) for municipalities to rely entirely on the private sector for the provision of required diversion and disposal services. It is anticipated that the establishment of the proposed C&D material disposal bans will necessitate an enhanced level of regulatory oversight, ideally leading to a "level playing field" for private C&D facility operators. Consistency in facility operational requirements within the province has the potential to create a more attractive, long term business opportunity for the private sector.

Additional effort for municipal enforcement of current provincial littering and open burning regulations will be required under the Proposed Conditions scenario. It is noted that a perceived barrier for municipalities will be the enforcement of a littering and open burning by-law. Based on

comments received from municipal representatives, significant effort may be required from the municipalities' legal department to establish an enforceable by-law under the summary offence act.

With reference to the project assumptions identified in Section 1.2, it is reiterated that the findings presented in this document are "appropriate for comparative planning purposes only". As noted in Sections 5 and 6, a significant number of assumptions and approximations (including those associated with future EPR programs and the sale of existing MRF assets in CBRM and Colchester County) were required to conduct the comparative analysis between the "Current Conditions" and "Proposed Conditions" scenarios. A more formalized and robust analysis of both individual material tonnages and current/future management costs could potentially provide a different NPV outcome from that presented in this report.

Appendix A

Waste Stream Characterization and Projection Information

Appendix A1 – Waste Stream Characterization and Tonnage Forecast
Town of Antigonish

TOWN OF ANTIGONISH

Table A1-1 - Baseline Waste Tonnage Information

Note: Town of Antigonish only manages (collects and transfers) Residential waste

Year: 2012	Waste Managed by Antigonish (tonnes)
	Residential
Waste	398.5
Recyclables	338.3
Organics	391.2
L&Y	
C&D	71.5
Metal	8.4
Bulky Waste	36.0
HHW	1.0
Other	12.8
Total:	1,257.7
Gen Rates (kg/person/year):	274.3

PP&P	338.3
Mattresses	8.6
Textiles	71.2
Tires (all)	23.1
Tires (OTR)	0.2

2012 Population
4,586

References:

Waste quantities from the data call for 2012

Population from 2011 Census (Stats Canada) forecasted to 2012 based on population growth trends

Table A1-2
Municipal Financial Impact Review - TOWN OF ANTIGONISH
Waste Managed by the Town of Antigonish - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[2]	% change in Population	Material	2016		2017		2018		2019		2020	
				Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Town of Antigonish	4,586	1.36%	1 Asphalt Shingles	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
			2 Carpet	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
			3 Clean Wood	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
			4 Wallboard	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
			5 HHW	0.5	2	0.5	2	0.5	2	0.5	3	0.5	3
			6A PP&P - Current	81.0	392	83.0	407	84.9	422	87.0	438	89.0	455
			6B PP&P - Proposed[1]	85	412	87	427	89	443	91	460	93	478
			7 Mattresses/Boxsprings	2.0	10	2.1	10	2.1	11	2.2	11	2.3	11
			8A Textiles - Current	17.1	83	17.5	86	17.9	89	18.3	92	18.7	96
			8B Textiles - Proposed[2]	13.8	67	14.1	70	14.5	72	14.8	75	15.2	78
			9 Tires (new)	0.06	0.26	0.06	0.26	0.06	0.27	0.06	0.28	0.06	0.28
			10 Cost Savings from Landfilling Less Waste	4.1	20	4.1	20	4.2	21	4.3	22	4.5	23

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

Table A1-2
Municipal Financial Impact Review - TOWN OF ANTIGONISH
Waste Managed by the Town of Antigonish - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[2]	% change in Population	Material	2021		2022		2023		2024		2025	
				Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Town of Antigonish	4,586	1.36%	1 Asphalt Shingles	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
			2 Carpet	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
			3 Clean Wood	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
			4 Wallboard	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
			5 HHW	0.5	3	0.6	3	0.6	3	0.6	3	0.6	3
			6A PP&P - Current	91.1	472	93.3	490	95.5	508	97.8	527	100.1	547
			6B PP&P - Proposed[1]	96	496	98	515	100	533	103	553	105	574
			7 Mattresses/Boxsprings	2.3	12	2.4	12	2.4	13	2.5	13	2.5	14
			8A Textiles - Current	19.2	99	19.6	103	20.1	107	20.6	111	21.1	115
			8B Textiles - Proposed[2]	15.5	80	15.9	83	16.3	87	16.7	90	17.1	93
			9 Tires (new)	0.06	0.29	0.06	0.30	0.07	0.30	0.07	0.31	0.07	0.32
			10 Cost Savings from Landfilling Less Waste	4.6	24	4.7	25	4.8	25	4.9	26	5.0	27

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

Appendix A2 – Waste Stream Characterization and Tonnage Forecast

CBRM

CBRM

Table A2-1 - Baseline Waste Tonnage Information

Note: Waste from CBRM goes to Guysborough. Accept PPP from Richmond, Port Hawkesbury, Eskasoni and Membertou

Year: 2012	Waste Managed by CBRM (tonnes)		
	Residential	ICI	Totals
Waste	18,661.5	12,084.7	30,746.2
Recyclables	5,263.3	2,210.4	7,473.7
Organics	7,572.8	3,572.8	11,145.6
L&Y	1,459.2	2,580.3	4,039.5
Wood	2,787.5	8,362.5	11,150.0
Mixed C&D	2,787.8	8,363.3	11,151.0
White Goods/Metal	431.5	1,294.6	1726.15
HHW	14.0	6.0	20
Total:	38,977.6	38,474.6	77,452.2
Gen Rates (kg/person/year):	404.0	398.8	

2012 Population
96,482

Res	ICI
0.7	0.3

Assumed Res/ICI split for Organics and PPP

References:

Waste quantities from the data call for 2012

Population from 2011 Census (Stats Canada) forecasted to 2012 based on population growth trends

	Tonnes	% of Ind Waste Stream
Shingles	1,874.2	9.54%
Carpet	1,069.1	6.22%
Clean Wood	11,189.9	61.92%
Wallboard	1,397.2	7.57%
PP&P	7,473.7	100%
Mattresses	348.8	1.06%
Textiles	3,607.9	10.98%
Tires (all)	1,202.6	3.66%
Tires (OTR)	12.0	0.04%

Table A2-2
Municipal Financial Impact Review - CBRM
Waste Managed by CBRM - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[3]	% change in Population		Material	2016		2017		2018		2019		2020	
					Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Cape Breton Regional Municipality	96,482	-0.94%	1	Asphalt Shingles	19.8	1,840	19.8	1,824	19.8	1,808	19.8	1,792	19.8	1,776
			2	Carpet	11.3	1,052	11.3	1,043	11.3	1,034	11.3	1,025	11.4	1,016
			3	Clean Wood	115.8	10,758	115.9	10,663	115.9	10,568	116.0	10,474	116.0	10,381
			4	Wallboard	14.8	1,374	14.8	1,361	14.8	1,349	14.8	1,337	14.8	1,325
			5	HHW	0.2	19	0.2	19	0.2	19	0.2	19	0.2	19
	112,889	-0.79%	6A	PP&P - Current	78.1	7,255	78.2	7,201	78.4	7,147	78.6	7,094	78.7	7,042
			6B	PP&P - Proposed[1]	82	7,618	82	7,561	82	7,504	82	7,449	83	7,394
	96,482	-0.94%	7	Mattresses/Boxsprings	3.7	340	3.7	337	3.7	334	3.7	331	3.7	328
			8A	Textiles - Current	37.8	3,511	37.8	3,480	37.8	3,449	37.8	3,418	37.9	3,388
			8B	Textiles - Proposed[2]	30.6	2,844	30.6	2,819	30.6	2,794	30.7	2,769	30.7	2,744
			9	Tires (new)	0.1	12	0.1	12	0.1	11	0.1	11	0.1	11
			10	Cost Savings from Landfilling Less Waste	3.9	363	3.9	360	3.9	357	3.9	355	3.9	352

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

[3] CBRM MRF accepts PPP from Richmond County, Port Hawksbury, Eskasoni and Membertou

Table A2-2
Municipal Financial Impact Review - CBRM
Waste Managed by CBRM - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[3]	% change in Population		Material	2021		2022		2023		2024		2025	
					Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Cape Breton Regional Municipality	96,482	-0.94%	1	Asphalt Shingles	19.9	1,760	19.9	1,744	19.9	1,729	19.9	1,713	19.9	1,698
			2	Carpet	11.4	1,006	11.4	998	11.4	989	11.4	980	11.4	971
			3	Clean Wood	116.1	10,288	116.2	10,197	116.2	10,106	116.3	10,016	116.3	9,927
			4	Wallboard	14.8	1,314	14.8	1,302	14.8	1,290	14.8	1,279	14.9	1,267
			5	HHW	0.2	18	0.2	18	0.2	18	0.2	18	0.2	18
	112,889	-0.79%	6A	PP&P - Current	78.9	6,990	79.0	6,938	79.2	6,886	79.3	6,835	79.5	6,785
			6B	PP&P - Proposed[1]	83	7,340	83	7,285	83	7,230	83	7,177	83	7,124
	96,482	-0.94%	7	Mattresses/Boxsprings	3.7	325	3.7	322	3.7	319	3.7	316	3.7	313
			8A	Textiles - Current	37.9	3,358	37.9	3,328	37.9	3,298	37.9	3,269	38.0	3,240
			8B	Textiles - Proposed[2]	30.7	2,720	30.7	2,696	30.7	2,671	30.7	2,648	30.8	2,624
			9	Tires (new)	0.1	11	0.1	11	0.1	11	0.1	11	0.1	11
			10	Cost Savings from Landfilling Less Waste	3.9	350	4.0	347	4.0	344	4.0	342	4.0	339

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

[3] CBRM MRF accepts PPP from Richmond County, Port Hawksbury, Eskasoni and Membertou

Appendix A3 – Waste Stream Characterization and Tonnage Forecast
Municipality of the District of Chester

CHESTER

Table A3-1 - Baseline Waste Tonnage Information

Note: Chester Accepts Waste from TOL, TOMB, Annapolis, Kings, etc.

Year: 2012	Waste Managed by Chester (tonnes)
Waste	34,183.2
Recyclables	963.7
Organics	1,621.3
L&Y	34.7
Wood	843.8
Shingles	454.1
Drywall	2,431.0
Mixed C&D	4,857.9
White Goods/Metal	145.0
HHW	30.0
Total:	45,564.6
Gen Rates (kg/person/year):	406.0

2012 Population
112,234

References:

Waste quantities from the data call for 2012

Population from 2011 Census (Stats Canada) forecasted to 2012 based on population growth trends

	Tonnes	% of Ind Waste Stream
Shingles	684.0	11.11%
Carpet	1,009.0	16.34%
Clean Wood	1,877.0	30.48%
Wallboard	605.0	9.83%
PP&P	963.7	
Mattresses	362.3	1.06%
Textiles	3,760.2	11.00%
Tires (all)	17.1	
Tires (OTR)	0.2	0.05%

Table A3-2
Municipal Financial Impact Review - CHESTER
Waste Managed by Chester - Tonnage Projections

ssumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1.00%

Municipal Unit	Estimated 2012 Population[3]	% change in Population		Material	2016		2017		2018		2019		2020	
					Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Chester	10,571	-0.26%	1	Asphalt Shingles	66.6	697	67.1	700	67.6	704	68.1	707	68.6	711
			2	Carpet	98.2	1,028	99.0	1,033	99.7	1,038	100.4	1,043	101.2	1,048
			3	Clean Wood	182.8	1,913	184.2	1,922	185.5	1,931	186.9	1,940	188.3	1,949
			4	Wallboard	58.9	617	59.4	620	59.8	623	60.3	626	60.7	629
			5	HHW	3.9	41	3.9	41	4.0	41	4.0	41	4.0	42
			6A	PP&P - Current	93.9	982	94.6	987	95.3	991	96.0	996	96.7	1,001
			6B	PP&P - Proposed[1]	99	1,031	99	1,036	100	1,041	101	1,046	102	1,051
	112,234	-0.11%	7	Mattresses/Boxsprings	3.3	372	3.3	374	3.4	376	3.4	379	3.4	381
			8A	Textiles - Current	34.5	3,855	34.8	3,880	35.0	3,904	35.3	3,929	35.5	3,954
			8B	Textiles - Proposed[2]	27.9	3,123	28.2	3,143	28.4	3,162	28.6	3,182	28.8	3,203
			9	Tires (OTR)	0.2	18	0.2	18	0.2	18	0.2	18	0.2	18
			10	Cost Savings from Landfilling Less Waste	4.7	49	4.7	49	4.8	50	4.8	50	4.8	50

Notes:

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

[2] Chester accepts waste (e.g. mattresses, textiles, etc.) from the Municipality of the District of Lunenburg, the Towns of Lunenburg, Bridgewater and Mahone Bay, Annapolis County and Kings County

Table A3-2
Municipal Financial Impact Review - CHESTER
Waste Managed by Chester - Tonnage Projections

ssumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1.00%

Municipal Unit	Estimated 2012 Population[3]	% change in Population		Material	2021		2022		2023		2024		2025	
					Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Chester	10,571	-0.26%	1	Asphalt Shingles	69.1	714	69.6	717	70.2	721	70.7	724	71.2	728
			2	Carpet	101.9	1,053	102.7	1,058	103.4	1,063	104.2	1,068	105.0	1,073
			3	Clean Wood	189.7	1,959	191.1	1,968	192.5	1,977	193.9	1,987	195.3	1,996
			4	Wallboard	61.2	632	61.6	635	62.1	638	62.5	641	63.0	644
			5	HHW	4.0	42	4.1	42	4.1	42	4.1	42	4.2	43
			6A	PP&P - Current	97.4	1,006	98.1	1,010	98.8	1,015	99.6	1,020	100.3	1,025
			6B	PP&P - Proposed[1]	102	1,056	103	1,061	104	1,066	105	1,071	105	1,076
	112,234	-0.11%	7	Mattresses/Boxsprings	3.4	383	3.5	386	3.5	388	3.5	391	3.6	393
			8A	Textiles - Current	35.8	3,979	36.1	4,004	36.3	4,030	36.6	4,055	36.9	4,081
			8B	Textiles - Proposed[2]	29.0	3,223	29.2	3,243	29.4	3,264	29.6	3,285	29.9	3,306
			9	Tires (OTR)	0.2	18	0.2	18	0.2	18	0.2	18	0.2	19
			10	Cost Savings from Landfilling Less Waste	4.9	50	4.9	51	4.9	51	5.0	51	5.0	51

Notes:

[1] 5% more PP&P collected under the Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under the Proposed Conditions Scenario starting in 2016

[2] Chester accepts waste (e.g. mattresses, textiles, etc.) from the Municipality of the District of Lunenburg, the Towns of Lunenburg, Bridgewater and Mahone Bay, Annapolis County and Kings County

Appendix A4 – Waste Stream Characterization and Tonnage Forecast
Municipality of the County of Colchester

COLCHESTER

Table A4-1 - Baseline Waste Tonnage Information

Note: Colchester accepts PPP from multiple municipalities

Year: 2012	Waste Managed by Colchester (tonnes)		
	Residential	ICI	Totals
Waste	6,081.7	13,655.2	19,736.9
Recyclables	8,179.4	1,129.7	9,309.1
Organics	4,798.5	2,456.5	7,255.1
Wood	1,269.0		1,269.0
Mixed C&D	4,294.0		4,294.0
White Goods/Metal	221.0		221.0
HHW	20.0		20.0
Total:	24,863.6	17,241.4	42,105.0

References:

Waste quantities from the data call for 2012

Population from 2011 Census (Stats Canada) forecasted to 2012 based on population growth trends

C&D	6.72%	4,294.0	% of C&D Stream
Asphalt Shingles	0.67%	428.1	9.97%
Carpet	0.96%	613.4	14.29%
Clean Wood	2.14%	1,367.4	31.85%
Wallboard	0.69%	440.9	10.27%
Other C&D Materials	2.26%		

From Rules of Thumb:

Waste	Total Managed:	19,736.9
Mattresses (0.1 generated/person/ year)	0.61%	119.8
Textiles (11% of disposed waste)	11%	2,171.1
OTR Tires (0.1% of tire stream = 0.04% of waste stream)	0.04%	7.9

Table A4-2
Municipal Financial Impact Review - COLCHESTER
Waste Managed by Colchester - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1.00%

Municipal Unit	Estimated 2012 Population[3]	% change in Population	Material	2016		2017		2018		2019		2020	
				Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated
Colchester	50,285	0.33%	1 Asphalt Shingles	9.0	457	9.1	465	9.2	473	9.3	480	9.5	488
			2 Carpet	12.9	655	13.0	666	13.2	677	13.4	688	13.6	700
			3 Clean Wood	28.7	1,461	29.1	1,485	29.4	1,510	29.8	1,535	30.2	1,560
			4 Wallboard	9.2	471	9.4	479	9.5	487	9.6	495	9.7	503
			5 HHW	0.4	21	0.4	22	0.4	22	0.4	22	0.4	23
	50,285	0.33%	6B-1 PP&P - Proposed (Option 1)	56.9	3,042	57.6	3,092	58.4	3,144	59.2	3,195	59.9	3,249
	125,645	0.01%	6A PP&P - Current	77.1	9,699	77.9	9,801	78.7	9,903	79.5	10,007	80.3	10,113
			6B-2 PP&P - Proposed[1] (Option 2)	81	10,184	82	10,291	83	10,398	83	10,507	84	10,619
	50,285	0.33%	7 Mattresses/Boxsprings	2.5	128	2.5	130	2.6	132	2.6	134	2.6	137
			8A Textiles - Current	45.5	2,319	46.1	2,357	46.7	2,397	47.4	2,436	48.0	2,477
			8B Textiles - Proposed[2]	36.9	1,878	37.4	1,909	37.9	1,942	38.4	1,973	38.9	2,006
			9 Tires (OTR)	0.2	8	0.2	9	0.2	9	0.2	9	0.2	9
			10 Cost Savings from Landfilling Less Waste (from diverting 5% more PP&P)	3.9	485	3.9	490	3.9	495	4.0	500	4.0	506

Notes:

[1] 5% more PP&P collected under Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under Proposed Conditions Scenario starting in 2016

[3] Colchester's MRF accepts PPP from the Towns of Antigonish, Windsor and Mulgrave, Antigonish County, District of Saint Mary's, Guysborough County and PCSWM

Table A4-2
Municipal Financial Impact Review - COLCHESTER
Waste Managed by Colchester - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1.00%

Municipal Unit	Estimated 2012 Population[3]	% change in Population		Material	2021		2022		2023		2024		2025	
					Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/yr)	Total Tonnes Generated
Colchester	50,285	0.33%	1	Asphalt Shingles	9.6	497	9.7	505	9.8	513	10.0	522	10.1	530
			2	Carpet	13.7	711	13.9	723	14.1	735	14.3	748	14.5	760
			3	Clean Wood	30.6	1,586	31.0	1,612	31.4	1,639	31.9	1,666	32.3	1,694
			4	Wallboard	9.9	511	10.0	520	10.1	529	10.3	537	10.4	546
			5	HHW	0.4	23	0.5	24	0.5	24	0.5	24	0.5	25
	50,285	0.33%	6B-1	PP&P - Proposed (Option 1)	60.7	3,302	61.5	3,358	62.4	3,414	63.2	3,470	64.0	3,528
	125,645	0.01%	6A	PP&P - Current	81.1	10,220	81.9	10,329	82.8	10,440	83.6	10,552	84.5	10,665
			6B-2	PP&P - Proposed[1] (Option 2)	85	10,731	86	10,845	87	10,962	88	11,080	89	11,198
	50,285	0.33%	7	Mattresses/Boxsprings	2.7	139	2.7	141	2.8	144	2.8	146	2.8	148
			8A	Textiles - Current	48.6	2,518	49.3	2,560	49.9	2,602	50.6	2,646	51.3	2,690
			8B	Textiles - Proposed[2]	39.4	2,040	39.9	2,074	40.4	2,108	41.0	2,143	41.5	2,179
			9	Tires (OTR)	0.2	9	0.2	9	0.2	9	0.2	10	0.2	10
			10	Cost Savings from Landfilling Less Waste (from diverting 5% more PP&P)	4.1	511	4.1	516	4.1	522	4.2	528	4.2	533

Notes:

[1] 5% more PP&P collected under Proposed Conditions Scenario starting in 2016

[2] 19% less textiles collected under Proposed Conditions Scenario starting in 2016

[3] Colchester's MRF accepts PPP from the Towns of Antigonish, Windsor and Mulgrave, Antigonish County, District of Saint Mary's, Guysborough County and PCSWM

Appendix A5 – Waste Stream Characterization and Tonnage Forecast
Pictou County Solid Waste Management

PCSWM

Table A5-1 - Baseline Waste Tonnage Information

Year: 2012	Waste Managed by PCSWM (tonnes)		
	Residential	ICI	Total
Waste	3,984.9	6,957.5	10,942.4
Recyclables	2,708.5		2,708.5
Organics	3,980.9	1,614.4	5,595.3
L&Y	252.2		252.2
C&D	1,183.5	2,104.0	3,287.5
White Goods	137.5	244.4	381.8
HHW	10.0		10.0
Total:	12,257.4	10,920.3	23,177.7

References:

Waste quantities managed by PCSWM from the data call for 2012

Population from 2011 Census (Stats Canada)

	Tonnes	% of Ind Waste Stream
Shingles	317.0	9.65%
Carpet	575.0	17.48%
Clean Wood	990.0	30.10%
Wallboard	298.0	9.08%
PP&P	2,708.0	100%
Mattresses	96.0	0.93%
Textiles	1,187.0	10.73%
Tires (OTR)	0.1	0.04%

Table A5-2
Municipal Financial Impact Review - PCSWM
Waste Managed by PCSWM - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[2]	% change in Population	Material	2016		2017		2018		2019		2020	
				Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Pictou County	44,998	-0.39%	1 Asphalt Shingles	7.2	320	7.3	320	7.3	321	7.4	322	7.4	322
			2 Carpet	13.1	579	13.2	580	13.2	582	13.3	583	13.4	584
			3 Clean Wood	22.5	998	22.7	1,000	22.8	1,002	22.9	1,004	23.1	1,006
			4 Wallboard	6.8	301	6.8	301	6.9	302	6.9	303	7.0	303
			5 HHW	0.2	10	0.2	10	0.2	10	0.2	10	0.2	10
			6A PP&P - Current	61.7	2,731	62.0	2,736	62.4	2,742	62.8	2,748	63.2	2,753
			6B PP&P - Proposed[1]	65	2,868	65	2,873	66	2,879	66	2,885	66	2,891
			7 Mattresses	2.2	97	2.2	97	2.2	98	2.2	98	2.2	98
			8A Textiles - Current	33.3	1,477	33.5	1,480	33.7	1,483	33.9	1,486	34.1	1,489
			8B Textiles - Proposed[2]	27.0	1,196	27.2	1,199	27.3	1,201	27.5	1,204	27.7	1,206
			9 Tires (new)	0.1	4	0.1	4	0.1	4	0.1	4	0.1	4
			10 Cost Savings from Landfilling Less Waste		137		137		137		137		138

[1] 5% more PP&P collected under the Proposed Conditions Scenario

[2] 19% less textiles collected under the Proposed Conditions Scenario

Table A5-2
Municipal Financial Impact Review - PCSWM
Waste Managed by PCSWM - Tonnage Projections

Assumptions:

1 Population growth projection from Statistics Canada 2011 Census; www.statcan.gc.ca/

2 Waste generation rate growth estimate 1%

Municipal Unit	Estimated 2012 Population[2]	% change in Population	Material	2021		2022		2023		2024		2025	
				Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated	Per Capita Generation Rate Managed Waste (kg/person/year)[1]	Total Tonnes Generated
Pictou County	44,998	-0.39%	1 Asphalt Shingles	7.4	323	7.5	324	7.5	324	7.6	325	7.6	326
			2 Carpet	13.5	585	13.6	586	13.6	588	13.7	589	13.8	590
			3 Clean Wood	23.2	1,008	23.4	1,010	23.5	1,012	23.6	1,014	23.8	1,016
			4 Wallboard	7.0	304	7.0	304	7.1	305	7.1	306	7.2	306
			5 HHW	0.2	10	0.2	10	0.2	10	0.2	10	0.2	10
			6A PP&P - Current	63.5	2,759	63.9	2,765	64.3	2,770	64.7	2,776	65.1	2,782
			6B PP&P - Proposed[1]	67	2,897	67	2,903	68	2,909	68	2,915	68	2,921
			7 Mattresses	2.3	98	2.3	98	2.3	99	2.3	99	2.3	99
			8A Textiles - Current	34.4	1,492	34.6	1,495	34.8	1,498	35.0	1,501	35.2	1,504
			8B Textiles - Proposed[2]	27.8	1,209	28.0	1,211	28.2	1,213	28.3	1,216	28.5	1,218
			9 Tires (new)	0.1	4	0.1	4	0.1	4	0.1	4	0.1	4
			10 Cost Savings from Landfilling Less Waste		138		138		139		139		139

[1] 5% more PP&P collected under the Proposed Conditions Scenario

[2] 19% less textiles collected under the Proposed Conditions Scenario

Appendix B
Cost Information

Appendix B1 – Cost Information
Town of Antigonish

TOWN OF ANTIGONISH

Table B1-1 - Current Conditions - Baseline Tonnages & Costs (Year: 2012)

					Tonnages Managed		Operating Costs	Revenue	Net Cost
			Quantity (Generated)	Approx. Quantity Managed	Managed Waste Generation Rate	Annual Operating Costs	Operating Cost per Tonne Managed[10]	Revenue (Current Tip Fee)	Net Cost Per Tonne Managed
	Material	Waste Stream	(tonnes)	(tonnes)	kg/person/ year	($)	($/tonne)	($/tonne)	($/tonne)
1	Asphalt Shingles[1]	C&D		0.00	0.0	$0.00	$0.00	$0.00	$0.00
2	Carpet[2]	Waste/C&D		0.00	0	$0.00	$0.00	$0.00	$0.00
3	Clean Wood[1]	C&D		0.00	0	$0.00	$0.00	$0.00	$0.00
4	Wallboard[1]	C&D		0.00	0.0	$0.00	$0.00	$0.00	$0.00
5	HHW[3]	Waste		2.00	0.4	$675	$337.50	$0	-$337.50
6	PP&P	Recyclables		338.34	74	$125,867.10	$372.01	$0.00	-$372.01
7	Mattresses[4]	Waste		8.55	1.9	$1,874.37	$219.17	$0.00	-$219.17
8	Textiles[5]	Waste		71.18	16	$15,601.35	$219.17	$0.00	-$219.17
9	Tires (OTR - new)[6]	Waste		0.23	0.1	$50.72	$219.17	$0.00	-$219.17

Info for Proportional Costing

Asphalt Shingles	7.20%
Carpet	14.70%
Clean Wood	31.80%
Wallboard	10.30%
Mattresses/Boxsprings	1.31%
Textiles	10.88%
OTR Tires	0.04%

Assumptions

1. Town of Antigonish does not manage C&D

2. Quantities managed include waste generated from the Residential sector only (including buildings with 4 units or less). ICI sector is not included.

3. Approximate HHW quantity managed estimated from PCSWM study & Product Care Manitoba HHW 2012 Program Year Annual Report

4. Mattresses generation rate: 0.1 mattresses/person/year (Ref: Otter Lake estimates, Hfx C&D Report, CPSC Report)

average weight: 52.58 lbs 23.81874 kgs

5. Textiles

average diversion rate: 18.92% **% of textiles in MSW landfilled waste: 11%**

Textiles generation rate: 0.032547598 tonnes/person/year (disposed)

2012 population 4,586

(7,000 tonnes diverted, 30,000 tonnes landfilled)

Ref: Bob Kenney (Truro waste audit + data from Value Village and Charities)

6. Tires (new): assume 0.1% of tire stream are OTR tires (new)

average weight: 251.0 lbs 113.7 kgs

Reference: Atlantic Tire Dealers Association, Tire Weight by Size, Farm & Industry, OTR & Forestry

7. Baseline year is Fiscal 2013 (April 2012 - March 2013)

8. 2012 population from 2011 Stats Canada Census (forecasted forward 1 year based on historical % change in population)

9. Current Tip Fees:

Antigonish does not collect tip fees

	Annual Op. Costs	Annual Revenue
C&D	$0	$0
Recyclables	$125,867	$0
Waste	$143,458	$0
HHW	$675	$0

*Residents/Contractors pay their own disposal fees

Table B1-2 - Current Conditions Scenario vs. Proposed Conditions Scenario - Tonnages & Costs - Baseline Year: 2016

TOWN OF ANTIGONISH

										CAPITAL $ (1)	OPERATING $ (2)		REVENUE $ (3)		NET BENEFIT $ (3)-(2)-(1)	
	Material	Waste Stream	Diversion Program Responsibility	Scenario	Approx. Quantity Managed 2016 (tonnes)	Assumed % of segregated material	Quantity Segregated (Diverted) (tonnes)	Assumed % of non-segregated material	Quantity in Mixed Loads (Landfilled) (tonnes)	Incremental Capital Costs ($)	Annual Operating Costs ($)	Operating Cost per Tonne Managed ($/tonne)	Annual Tip Fee Revenue ($)	Tip Fee[1] ($/tonne)	Net Benefit ($)	Net Benefit Per Tonne Managed ($/tonne)
1	Asphalt Shingles	C&D	Municipality	Current Conditions	0						$0	$0.00	$0.00	$0.0	$0.0	$0.00
				Proposed Conditions							$0	$0.00	$0.0	$0.0	$0.0	$0.00
2	Carpet	C&D	EPR	Current Conditions	0						$0	$0.00	$0.00	$0.0	$0.0	$0.00
				Proposed Conditions							$0	$0.00	$0.0	$0.0	$0.0	$0.00
3	Clean Wood	C&D	Municipality	Current Conditions	0						$0	$0.00	$0.00	$0.0	$0.0	$0.00
				Proposed Conditions							$0	$0.00	$0.0	$0.0	$0.0	$0.00
4	Wallboard	C&D	Municipality	Current Conditions	0						$0	$0.00	$0.00	$0.0	$0.0	$0.00
				Proposed Conditions							$0	$0.00	$0.0	$0.0	$0.0	$0.00
5	HHW[2]	Waste	EPR	Current Conditions	2				2		$675	$337.50	$0.00	$0.0	-$675.0	-$337.50
				Proposed Conditions[2]		100%	2				$34	$67.50	$0.0	$0.0	-$33.8	-$67.50
6	PP&P[3]	Recyclables	EPR	Current Conditions	392	100%	392				$125,867	$372.01	$0	$0.0	-$125,867	-$372.01
				Proposed Conditions[3]	412	100%	412	0%	0		$39,648	$96.33	$0.0	$0.0	-$39,648	-$96.33
7	Mattresses	Waste	EPR	Current Conditions	10			90%	10		$1,874	$219.17	$0.00	$0.0	-$1,874	-$219.17
				Proposed Conditions		90%	10	10%	-		$0	$0.00	$0.0	$0.0	$0.0	$0.00
8	Textiles	Waste	Private Sector	Current Conditions	83			100%	83		$15,601	$219.17	$0.00	$0.0	-$15,601	-$219.17
				Proposed Conditions	67	19%	8	81%	67		$14,735	$177.53	$0	$0.0	-$14,735	-$219.17
9	Tires (OTR - new)	Waste	RRFB	Current Conditions	0.26				0.26		$51	$219.17	$0.00	$0.0	-$50.7	-$219.17
				Proposed Conditions		100%	0.26	0%	-		$0	$0.00	$0.0	$0.0	$0.0	$0.00
				Current Conditions												
10	5% Reduction in Waste Tonnages			Proposed Conditions	20						$4,296		$0.0		$4,296	$219.17
				Current Conditions												
11	Additional littering/open burning enforcement effort			Proposed Conditions							-$240				-$240	

[1]Tip Fees:
None

Proposed Scenario New Operating Costs (2016 $)
None

Proposed Scenario New Capital Costs (2016 $)
New Capital Items (Diversion Program Scenario) (2015 Expenditures)
None

Textiles:

Current Diversion	19%
Future Diversion	38%

Assumptions:

[2] 20% of HHW costs borne by municipality in Proposed Conditions Scenario

[3] 30% of PPP costs borne by municipality in Proposed Conditions Scenario

Table B1-3 - Operating Costs and Revenues from the Data Call (2012/13) -- TOWN OF ANTIGONISH

OPERATING COSTS

Data Call Ref Page #:	Pg. 1	Provided by Nicole H	Pg. 8	Pg. 14	Pg. 15	
	Curbside Collection	Recyclables Processing Fee	Tip Fees paid to Landfill site	Admin	Education Costs	Total
C&D						$0
Recyclables	$92,001	$21,992		$7,291	$4,583	$125,867
Waste	$94,624		$29,012	$6,076	$3,775	$133,487
Bulky Waste	$9,971					$9,971
HHW				$405	$270	$675

REVENUES

NO REVENUES

Appendix B2 – Cost Information

CBRM

CBRM

Table B2-1 - Current Conditions - Tonnages & Costs - Baseline Year: 2012

			Tonnage Managed		Operating		Revenue		Net Cost
	Material	Waste Stream	Approx. Quantity Managed	Managed Waste Generation Rate	Annual Operating Costs	Operating Cost per Tonne Managed[10]	Annual Revenue	Revenue (Current Tip Fee)	**Net Cost Per Tonne Managed**
			(tonnes)	kg/person/ year	($)	($/tonne)	($)	($/tonne)	**($/tonne)**
1	Asphalt Shingles[1]	C&D	1,895	19.6	131,608	$70.83	$90,738	$47.89	-$22.94
2	Carpet[1]	C&D	1,083	11	85,872	$70.83	$59,205	$54.69	-$16.14
3	Clean Wood[1]	C&D	11,150	116	436,921	$39.19	$579,800	$52.00	$12.81
4	Wallboard[1]	C&D	1,414	14.7	104,443	$70.83	$72,009	$50.94	-$19.89
5	HHW[3]	Waste	20	0.2	24,316	$1,215.80	$0	$0	-$1,215.80
6	PP&P	Recyclables	7,474	77	2,780,119	$371.99	$1,039,611	$139.10	-$232.88
7	Mattresses[4]	Waste	349	3.6	64,055	$183.65	$8,791	$25.21	-$158.45
8	Textiles[5]	Waste	3,608	37	665,277	$184.40	$91,308	$25.31	-$159.09
9	Tires (OTR - new)	Waste	12	0.1	2,218	$184.40	$304	$25.31	-$159.09

Info for Proportional Costing (weighted average)

Asphalt Shingles	9.54%
Carpet	6.22%
Clean Wood	61.92%
Wallboard	7.57%
Mattresses	1.06%
Textiles	10.98%
Tires (OTRl)	0.04%

Assumptions

1. C&D quantities generated managed by CBRM from 2012 Data Call (provided by NSE).

2. ***Approximate carpet generation rate****:*

Carpet gen. rate: 0.0075 tonnes/person/year

Ref: http://www.environmental-expert.com/news/landfill-diversion-of-carpet-waste-continues-to-rise-says-carpet-recycling-uk-466244?utm_source=News_Waste_Recycling

3. Approximate HHW quantity managed from Data Call (Page 39) & Product Care Manitoba HHW 2012 Program Year Annual Report

4. Mattresses generation rate: 0.1 mattresses/person/year (Ref: Otter Lake estimates, Hfx C&D Report, CPSC Report)

average weight: 52.58 lbs 23.81874 kgs

5. Textiles

avg diversion rate: 18.92% % of textiles in MSW landfilled waste: 11%

Textiles gen. rate: 0.0401 tonnes/person/year

2012 population 96,482

(7,000 tonnes diverted, 30,000 tonnes landfilled)

Ref: Bob Kenney (Truro waste audit + data from Value Village and Charities)

	Annual Op. Costs	Annual Revenue
C&D	$1,379,542	$951,130
Recyclables	$2,780,119	$1,039,611
Waste	$6,057,958	$831,442
HHW	$24,316	$0

6. Tires (new): assume 0.1% of tire stream are OTR tires (new)

average weight: 251.0 lbs 113.7 kgs

Reference: Atlantic Tire Dealers Association, Tire Weight by Size, Farm & Industry, OTR & Forestry

7. Baseline year is Fiscal 2013 (April 2012 - March 2013)

8. 2012 population from 2011 Stats Canada Census (forecasted forward 1 year based on historical % change in population)

9. Current Tip Fees:

	minimum fee:		/tonne
Waste (at transfer station):		$80	/tonne
Recyclables		$65	/tonne
Mixed C&D		$80	/tonne
Segregated C&D		$40	/tonne

10. C&D in mixed loads incoming

C&D	$40	/tonne	C&D in mixed loads: $80 /tonne

Table B2-2 - Current Conditions Scenario vs. Proposed Conditions Scenario - Tonnages & Costs - Baseline Year: 2016

CBRM

											CAPITAL $ (1)	OPERATING $ (2)		REVENUE $ (3)		NET BENEFIT $ (3)-(2)-(1)	
	Material	Waste Stream	Diversion Program Responsibility	Scenario	Approx. Quantity Managed 2016 (tonnes)	Assumed % of segregated material	Quantity Segregated (Diverted) (tonnes)	Assumed % of non-segregated material	Quantity in Mixed Loads (Landfilled) (tonnes)	Incremental Capital Costs ($)	Annual Operating Costs ($)	Operating Cost per Tonne Managed ($/tonne)	Annual Tip Fee Revenue ($)	Tip Fee[1] ($/tonne)	Net Benefit ($)	Net Benefit Per Tonne Managed ($/tonne)
1	Asphalt Shingles	C&D	Municipality	Current Conditions	1,840			100%	1,840		$131,608	$70.83	$88,117	$47.9	-$43,492	-$22.94
				Proposed Conditions		80%	1,472	20%	368	$13,761	$143,825	$78.17	$88,320	$48.0	-$69,266	-$37.64
2	Carpet	C&D	EPR	Current Conditions	1,052			100%	1,052		$85,872	$70.83	$57,535	$54.7	-$28,336	-$16.14
				Proposed Conditions		80%	842	20%	210		$14,902	$14.17	$16,832	$48.0	$1,930	$1.83
3	Clean Wood	C&D	Municipality	Current Conditions	10,758	70%	7,531	30%	3,227		$436,921	$39.19	$559,416	$52.0	$122,495	$12.81
				Proposed Conditions		80%	8,606	20%	2,152	$89,318	$392,394	$36.47	$516,384	$48.0	$34,671	$3.22
4	Wallboard	C&D	Municipality	Current Conditions	1,374			100%	1,374		$104,443	$70.83	$69,994	$50.9	-$34,449	-$19.89
				Proposed Conditions		60%	824	40%	550	$10,921	$55,415	$40.33	$76,944	$56.0	$10,608	$7.72
5	HHW[2]	Waste	EPR	Current Conditions	19			100%	19		$24,316	$1,215.80	$0	$0.0	-$24,316	-$1,215.80
				Proposed Conditions[2]		100%	19				$4,620	$243.16	$0	$0.0	-$4,620	-$243.16
6	PP&P[3]	Recyclables	EPR	Current Conditions	7,255		7,255				$2,780,119	$371.99	$1,009,187	$139.1	-$1,770,933	-$232.88
				Proposed Conditions[3]	7,618	100%	7,618	0%	0		$834,036	$109.49	$0	$0.0	-$834,036	-$109.49
7	Mattresses	Waste	EPR	Current Conditions	340				340		$64,055	$183.65	$8,570	$25.2	-$55,485	-$158.45
				Proposed Conditions		90%	340				$0	$0.00	$0	$0.0	$0	$0.00
8	Textiles	Waste	Private Sector	Current Conditions	3,511			100%	3,511		$665,277	$184.40	$88,856	$25.3	-$576,421	-$159.09
				Proposed Conditions	2,844						$524,407	$184.40	$71,974	$25.3	-$452,433	-$159.09
9	Tires (OTR - new)	Waste	RRFB	Current Conditions	12				12		$2,218	$184.40	$304	$25.3	-$1,914	-$159.09
				Proposed Conditions		100%	12	0%	100%		$0	$0.00	$0	$0.0	$0	$0.00
				Current Conditions												
10	Savings from 5% Reduction in Waste Tonnages			Proposed Conditions	363						$66,890		-$9,180		$57,709	$159.09
				Current Conditions												
11	Additional littering/open burning enforcement effort			Proposed Conditions							-$5,177				-$5,177	
				Current Conditions												
12	Sale of the MRF (assume $ to be received in 2016)			Proposed Conditions									$1,400,000		$1,400,000	

[1]Tip Fees:

Segregated C&D Loads (Municipal Programs):	$40
Mixed C&D Loads:	$80
Waste tip fee (2015):	$85

Note: Tip fee for "Proposed Conditions" is weighted average for Items 1-4 and 8

Textiles:

Current Diversion	19%
Future Diversion	38%

Scenario (B) New Operating Costs (2016 $)

Shingles Processing and Hauling Cost:

Total: $80 /tonne

Clean Wood Processing Cost:

Already processing wood - assume a 20% increase in costs

$40,000

Drywall Processing and Hauling Cost:

Total: $20 /tonne

Scenario (B) New Capital Costs (2016 $)

New Capital Items (Diversion Program Scenario) (2015 Expenditures)

C&D Landfill Laydown Area	$52,000	borne by Municipality
Extension to Public Drop Off	$31,000	covered by EPR
Small Quantity C&D Drop Off	$62,000	borne by Municipality

Shingles	9.54%	12.1%
Carpet	6.22%	
Clean Wood	61.92%	78.3%
Wallboard	7.57%	9.6%
	85.26%	79.03%

Assumptions:

[2] 20% of HHW costs borne by municipality in Proposed Conditions Scenario

[3] 30% of PPP costs borne by municipality in Proposed Conditions Scenario

Table B2-3 - Operating Costs and Revenues from the Data Call (2012/13) - CBRM

OPERATING COSTS

Data Call Ref Page #:	Page 2	Page 5	Page 9		Page 25		Page 27			Page 50	Page 43	Page 44	From Francis	
	Curbside Collection Operating Costs	Freight for PPP	Recycling Operating Costs (MRF Costs)	Recycling Operating Costs (Commission Fee)	Tipping Fees paid to landfill	Line Hauling	C&D Disposal Operating Costs	Long term disposal site close-out	C&D processing costs (shredder)	HHW operating costs	Admin Costs	Education Costs	TS Operating Costs	Totals
C&D							$1,359,234	$20,308						$1,379,542
Wood									$200,000					$200,000
Recyclables	$408,633	$116,431	$1,954,843	$159,951							$101,342	$38,919		$2,780,119
Waste	$1,464,248				$2,169,062	$939,970		$20,308			$430,702	$165,404	$570,000	$5,759,694
Bulky Waste	$298,264													$298,264
HHW										$12,628	$8,445	$3,243		$24,316

REVENUES

Data Call Ref Page	Page 5	Page 11	page 34		
	Recyclable Materials Marketed	Recycling Revenue for tip fees & processing contracts	C&D Revenues	Transfer Station Revenue	Totals
C&D			$951,130		$951,130
Recyclables	$751,628	$287,983			$1,039,611
Waste				$831,442	$831,442

APPENDIX B2-4
Proposed/Future Costs Scenario

Municipality/Authority: CAPE BRETON REGIONAL MUNICIPALITY

CAPITAL (2016 expenditures)

1) C&D Landfill Laydown Area

- Development of two areas in proximity to Public Drop Off; one for clean wood and for shingles/drywall.
- To accommodate segregation/grinding/storage of asphalt shingles, clean wood and drywall.
- Drywall pile to be tarped to minimize exposure to precipitation.
- Assume 1500 m^2 area for clean wood and 1200 m^2 for clean wood/drywall, aggregate surface (300 mm thick).

Item No.	Description	Unit	Estimated Quantity	Assumed Unit Price	Proposed Amount*
1	Final Grading	m^2	2,700	$ 1.00	$ 3,000
2	Geotextile	m^2	2,700	$ 3.25	$ 9,000
3	Granular Class B (300 mm)	m^3	810	$ 35.00	$ 28,000
				Subtotal	$ 40,000
				Engineering/Contingency at 30%	$ 12,000
				Total Estimated Budget	**$ 52,000**

*: costs rounded to nearest $1000

2) Extension to Public Drop Off Structure

- Addition of a roof structure over two of the bays at the current drop off to accommodate two 40 cy weather protected roll offs.
- Reassign two existing mixed C&D roll off bays to carpet and mattress/box spring roll offs. Direct mixed C&D to Small Quantity Drop Off Area (see below).
- One roll off for mattresses/box springs, one for carpet.
- Assumption that mattress/box spring and carpet stewardship agencies will provide the roll offs from their own supply.
- Stewards will deliver an empty roll off when they remove a full one as part of a provincial collection system.
- Assumption that the capital cost for the extended drop off structure will be covered by the stewards.

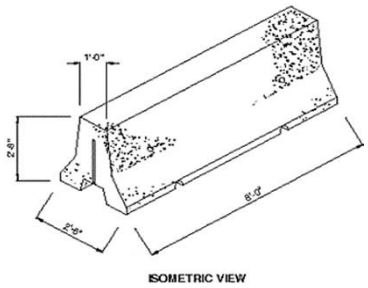
Cost for two bay steel roof structure	$25,000
Engineering/Contingency at 25%	$6,000
Total Estimated Budget	**$31,000**

3) Small Quantity C&D Drop Off Area

- To accommodate utility trailer/pick up truck loads of C&D materials, larger contractor loads will be directed to the C&D Landfill Laydown Areas.
- To be located to the east of the public drop off area.
- To consist of a 10m x 50m asphalt pad with concrete jersey barrier separated stalls for clean wood, shingles, drywall and mixed C&D.

Item No.	Description	Unit	Estimated Quantity	Assumed Unit Price	Proposed Amount*
1	Final Grading	m^2	500	$ 1.00	$ 1,000
2	Geotextile	m^2	500	$ 3.25	$ 2,000
3	Granular Class B (300 mm)	m^3	150	$ 35.00	$ 5,000
4	Asphalt	m^2	500	$ 45.00	$ 23,000
5	Concrete Jersey Barriers (2.4m)	ea	31	$ 500.00	$ 16,000
6	Signage	LS	1	$ 1,000.00	$ 1,000
				Subtotal	$ 48,000
				Engineering/Contingency at 30%	$ 14,000
				Total Estimated Budget	**$ 62,000**

*: costs rounded to nearest $1000



Jersey Barrier (typical)

Appendix B3 – Cost Information
Municipality of the District of Chester

CHESTER

Table B3-1 - Current Conditions - Tonnages & Costs - Baseline Year: 2012

			Tonnage Managed		Operating		Revenue		Net Cost	
			Approx. Quantity Managed	Managed Waste Generation Rate	Annual Operating Costs	Operating Cost per Tonne Managed[10]	Annual Revenue	Revenue/ tonne	**Net Cost**	**Net Cost per Tonne**
	Material	Waste Stream	(tonnes)	kg/person/ year	($)	($/tonne)	($)	($/tonne)	($)	($/tonne)
1	Asphalt Shingles[1]	C&D	684	64.7	$21,377	$31.25	$31,809	$46.50	$10,432	$15.25
2	Carpet[1]	C&D	1,009	95	$35,300	$35.00	$66,565	$66.00	$31,265	$31.00
3	Clean Wood[1]	C&D	1,877	178	$58,181	$31.00	$84,831	$45.20	$26,651	$14.20
4	Wallboard[1]	C&D	605	57.2	$21,180	$35.00	$39,939	$66.00	$18,759	$31.00
5	HHW[3]	Waste	40	3.8	$21,951	$548.78	$0	$0.00	-$21,951	-$548.78
6	PP&P	Recyclables	964	91	$240,823	$249.91	$0	$0.00	-$240,823	-$249.91
7	Mattresses[4]	Waste	362	3.2	$39,811	$109.87	$23,652	$65.28	-$16,159	-$44.60
8	Textiles[5]	Waste	3,760	34	$413,132	$109.87	$245,446	$65.28	-$167,686	-$44.60
9	Tires (OTR - new)	Waste	17	0.2	$1,878	$109.87	$1,116	$65.28	-$762	-$44.60

Info for Proportional Costing (weighted average)

Asphalt Shingles	11.11%
Carpet	16.38%
Clean Wood	30.48%
Wallboard	9.83%
Mattresses	1.06%
Textiles	11.00%
Tires (OTR)	0.05%

Assumptions

1. C&D quantities generated managed by Chester from 2012 Data Call (provided by NSE).

4. Mattresses generation rate: 0.1 mattresses/person/year (Ref: Otter Lake estimates, Hfx C&D Report, CPSC Report)

average weight: 52.58 lbs 23.81874 kgs

5. Textiles

average diversion rate 18.92% % of textiles in MSW landfilled waste: 11%

Textiles generation rat 0.032547598 tonnes/person/year

2012 population 10,571 112,234

(7,000 tonnes diverted, 30,000 tonnes landfilled)

Ref: Bob Kenney (Truro waste audit + data from Value Village and Charities)

	Annual Op. Costs	Annual Revenue
C&D	$115,677	$331,337
Recyclables	$240,823	$0
Waste	$3,755,742	$2,231,323
HHW	$21,951	$0

6. Tires (new): assume 0.1% of tire stream are OTR tires (new)

average weight: 251.0 lbs 113.7 kgs

Reference: Atlantic Tire Dealers Association, Tire Weight by Size, Farm & Industry, OTR & Forestry

7. Quantities include waste generated from the Residential and ICI sector that is managed by Chester.

8. Baseline year is Fiscal 2013 (April 2012 - March 2013)

9. 2012 population from 2011 Stats Canada Census (forecasted forward 1 year based on historical % change in population)

10. Current Tip Fees:

Waste	$69	/tonne
C&D - mixed	$52	/tonne
C&D - segregated	$35	/tonne
Waste - Outside Chester	$78	/tonne
C&D - mixed (outside Chester)	$80	/tonne
C&D - segregated (outside Chester)	$45	/tonne

11. C&D in mixed loads incoming

11. C&D in mixed loads incoming

	mixed	segregated
Shingles:	25%	75%
Carpet:	100%	0%
Wood:	20%	80%
Wallboard:	100%	0%

Table B3-2 - Current Conditions Scenario vs. Proposed Conditions Scenario - Tonnages & Costs - Baseline Year: 2016

CHESTER

										CAPITAL $ (1)	OPERATING $ (2)		REVENUE $ (3)		NET BENEFIT $ (3)-(2)-(1)	
	Material	Waste Stream	Diversion Program Responsibility	Scenario	Approx. Quantity Managed 2016 (tonnes)	Assumed % of segregated material	Quantity Segregated (Diverted) (tonnes)	Assumed % of non-segregated material	Quantity in Mixed Loads (Landfilled) (tonnes)	Incremental Capital Costs ($)	Annual Operating Costs ($)	Operating Cost per Tonne Managed ($/tonne)	Annual Revenue ($)	Tip Fee[1] ($/tonne)	Net Benefit ($)	Net Benefit Per Tonne Managed ($/tonne)
1	Asphalt Shingles	C&D	Municipality	Current Conditions	697	75%	523	25%	174		$21,781	$31.25	$37,464	$53.8	$15,683	$22.50
				Proposed Conditions		80%	558	20%	139	$11,019	$34,989	$50.20	$36,244	$52.0	-$9,765	-$14.01
2	Carpet	C&D	EPR	Current Conditions	1,028						$35,300	$34.34	$66,565	$64.8	$31,265	$30.41
				Proposed Conditions		80%	822	20%	206		$7,196	$7.00	$16,448	$16.0	$9,252	$9.00
3	Clean Wood	C&D	Municipality	Current Conditions	1,913	80%	1,530	20%	383		$59,303	$31.00	$99,476	$52.0	$40,173	$21.00
				Proposed Conditions		80%	1,530	20%	383	$30,233	$59,303	$31.00	$99,476	$52.0	$9,940	$5.20
4	Wallboard	C&D	Municipality	Current Conditions	617	0%	0	100%	617		$21,595	$35.00	$49,360	$80.0	$27,765	$45.00
				Proposed Conditions		60%	370	40%	247	$9,748	$25,667	$41.60	$36,403	$59.0	$988	$1.60
5	HHW[2]	Waste	EPR	Current Conditions	41						$21,951	$535.39	$0	$0.0	-$21,951	-$535.39
				Proposed Conditions[2]		100%	41	0%			$4,390	$107.08	$0	$0.0	-$4,390	-$107.08
6	PP&P[3]	Recyclables	EPR	Current Conditions	982						$240,823	$245.24	$0	$0.0	-$240,823	-$245.24
				Proposed Conditions[3]	1,031	100%	1,031	0%	0		$72,247	$70.07	$0	$0.0	-$72,247	-$70.07
7	Mattresses	Waste	EPR	Current Conditions	372						$39,811	$107.02	$29,760	$80.0	-$10,051	-$27.02
				Proposed Conditions		90%	372	10%	-		$0	$0.00	$0	$0.0	$0	$0.00
8	Textiles	Waste	Private Sector	Current Conditions	3,855						$423,553	$109.87	$308,400	$80.0	-$115,153	-$29.87
				Proposed Conditions	3,123						$343,078	$109.87	$249,804	$80.0	-$93,274	-$29.87
9	Tires (OTR - new)	Waste	RRFB	Current Conditions	18						$1,878	$104.33	$1,116	$62.0	-$762	-$42.34
				Proposed Conditions							$0	$0.00	$0	$0.0	$0	$0.00
				Current Conditions												
10	Savings from 5% Reduction in Waste Tonnages			Proposed Conditions	49						$5,395		-$3,205		$1,467	$29.87
				Current Conditions												
11	Additional littering/open burning enforcement effort			Proposed Conditions							$563				$563	

[1]Tip Fees:

Segregated C&D Loads (EPR Programs):	$0
Segregated C&D Loads (Municipality Responsible):	$45
Mixed C&D Loads:	$80
Waste tip fee (2016):	$80

Note: Tip fee for "Proposed Conditions" is weighted average for Items 1-4 and 8

Assumptions:

[2] 20% of HHW costs borne by municipality in Proposed Conditions Scenario

[3] 30% of PPP costs borne by municipality in Proposed Conditions Scenario

Proposed Scenario New Operating Costs (2016 $)

Shingles Processing and Hauling Cost:

(current)	$30 /tonne
(proposed future)	$54 /tonne

Wood: assume no change to current processing costs

Drywall Processing and Hauling: $46 /tonne

Proposed Scenario New Capital Costs (2016 $)

New Capital Items (Diversion Program Scenario) (2015 Expenditures)

C&D Landfill Laydown Area	$17,000	borne by Municipality
Extension to Public Drop Off Structure	N/A	covered by EPR
Small Quantity C&D Drop Off	$34,000	borne by Municipality

Table B3-3 - Operating Costs and Revenues from the Data Call (2012/13) -- CHESTER

OPERATING COSTS

Data Call Ref Page #:	Page 2	Page 18			Page 26	Page 50	Page 43	Page 44		
	Curbside Collection Operating Costs	Landfill site operating cost	Long term disposal site close out	C&D waste processing	C&D Debris Disposal Site Operating Cost	HHW Operating Costs	Admin Costs	Education Costs	Recycling Processing Fees	Totals
C&D		$84,968.00		$27,709	$3,000					$115,677
Recyclables	$120,910						$20,500	$13,750	$85,663	$240,823
Waste	$293,720	$2,732,022	$550,000				$150,000	$30,000		$3,755,742
Metal Collection										$0
HHW						$17,451	$3,000	$1,500		$21,951
		$2,847,699 MSW + C&D								

REVENUES

Data Call Ref Page #:	Page 20	Page 33	
	Disposal Site Revenue	Sale of White goods/metal	Totals
C&D	$0	$9,799	$9,799
Recyclables			$0
Waste	$2,231,323		$2,231,323
Asbestos			$0

Appendix B3-4
Proposed/Future Costs Scenario

Municipality/Authority: **MUNICIPALITY OF THE DISTRICT OF CHESTER**

CAPITAL (2016 expenditures)

1) C&D Landfill Laydown Area

- Large rough graded area west of C&D landfill already in place.
- To accommodate segregation/grinding/storage of asphalt shingles, clean wood and drywall.
- Drywall pile to be tarped to minimize exposure to precipitation.
- Assume 30m x 30m aggregate surface (300 mm thick).

Item No.	Description	Unit	Estimated Quantity	Assumed Unit Price	Proposed Amount*
1	Final Grading	m^2	900	$ 1.00	$ 1,000
2	Geotextile	m^2	900	$ 3.25	$ 3,000
3	Granular Class B (300 mm)	m^3	270	$ 35.00	$ 9,000
				Subtotal	$ 13,000
				Engineering/Contingency at 30%	$ 4,000
				Total Estimated Budget	**$ 17,000**

*: costs rounded to nearest $1000

2) Extension to Public Drop Off Structure

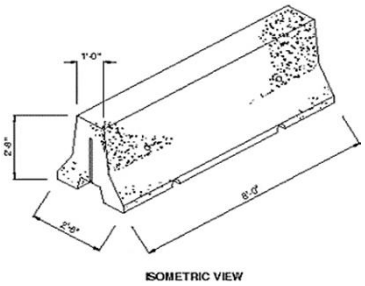
- Reassign clean wood and dirty wood roll off bays to carpet and mattress/box spring roll offs. Direct clean and dirty wood to Small Quantity Drop Off Area (see below).
- One roll off for mattresses/box springs, one for carpet.
- Assumption that mattress/box spring and carpet stewardship agencies will provide the roll offs from their own supply.
- Stewards will deliver an empty roll off when they remove a full one as part of a provincial collection system.
- Extension to existing Public Drop Off Structure not required.

3) Small Quantity C&D Drop Off Area

- To accommodate utility trailer/pick up truck loads of C&D materials, larger contractor loads will be directed to the C&D Landfill Laydown Areas.
- To be located to the east of the existing public drop off area.
- To consist of a 10m x 50m asphalt pad with concrete jersey barrier separated stalls for clean wood, shingles, drywall and mixed C&D.

Item No.	Description	Unit	Estimated Quantity	Assumed Unit Price	Proposed Amount*
1	Final Grading	m^2	250	$ 1.00	$ 1,000
2	Geotextile	m^2	250	$ 3.25	$ 1,000
3	Granular Class B (300 mm)	m^3	75	$ 35.00	$ 3,000
4	Asphalt	m^2	250	$ 45.00	$ 11,000
5	Concrete Jersey Barriers (2.4m)	ea	18	$ 500.00	$ 9,000
6	Signage	LS	1	$ 1,000.00	$ 1,000
				Subtotal	$ 26,000
				Engineering/Contingency at 30%	$ 8,000
				Total Estimated Budget	**$ 34,000**

*: costs rounded to nearest $1000



ISOMETRIC VIEW

Jersey Barrier (typical)

Appendix B4 – Cost Information
Municipality of the County of Colchester

COLCHESTER

Table B4-1 - Current Conditions - Tonnages & Costs - Baseline Year: 2012

			Tonnage Managed		Operating		Revenue		Net Cost	
	Material	Waste Stream	Approx. Quantity Managed	Managed Waste Generation Rate	Annual Operating Costs	Operating Cost per Tonne Managed[10]	Annual Revenue	Revenue per Tonne Managed	Net Cost	**Net Cost Per Tonne Managed**
			(tonnes)	kg/person/ year	($)	($/tonne)	($)	($/tonne)	($)	**($/tonne)**
1	Asphalt Shingles[1]	C&D	428	8.5	16,588	$38.75	$24,652	$57.58	$8,064	$18.84
2	Carpet[1]	C&D	613	12	23,768	$38.75	$35,322	$57.58	$11,554	$18.84
3	Clean Wood[1]	C&D	1,367	27	94,903	$69.40	$78,738	$57.58	-$16,165	-$11.82
4	Wallboard[1]	C&D	441	8.8	17,083	$38.75	$25,387	$57.58	$8,304	$18.84
5	HHW[3]	Waste	20	0.4	13,264	$663.20	$0	$0.00	-$13,264	-$663.20
6	PP&P[2]	Recyclables	9,309	74	2,645,944	$284.23	$1,916,337	$205.86	-$729,607	-$78.38
7	Mattresses[4]	Waste	120	2.4	14,852	$124.00	$8,169	$68.21	-$6,682	-$55.79
8	Textiles[5]	Waste	2,171	43	269,208	$124.00	$148,079	$68.21	-$121,129	-$55.79
9	Tires (OTR - new)	Waste	8	0.2	979	$124.00	$538	$68.21	-$440	-$55.79

Info for Proportional Costing (weighted average)

Asphalt Shingles	9.97%
Carpet	14.29%
Clean Wood	31.85%
Wallboard	10.27%
Mattresses/Boxsprings	0.61%
Textiles	11.00%
OTR Tires	0.04%

Assumptions

1. C&D quantities generated managed by Colchester from 2012 Data Call (provided by Colchester WM).

2. Colchester receives PPP from 10 municipalities

3. Approximate HHW quantity managed from Data Call (Page 39) & Product Care Manitoba HHW 2012 Program Year Annual Report

4. Mattresses generation rate: 0.1 mattresses/person/year (Ref: Otter Lake estimates, Hfx C&D Report, CPSC Report)

average weight: 52.58 lbs 23.81874 kgs

5. Textiles

average diversion rate 18.92% % of textiles in MSW landfilled waste: 11%

Textiles generation ra 0.040142038 tonnes/person/year

2012 population (Col 50,285

2012 (serviced by MR 125,645

(7,000 tonnes diverted, 30,000 tonnes landfilled)

Ref: Bob Kenney (Truro waste audit + data from Value Village and Charities)

	Annual Op. Costs	Annual Revenue
C&D	$144,903	$247,251
Recyclables	$2,645,944	$1,916,337
Waste	$2,447,346	$1,346,170
HHW	$13,264	$0

6. Tires (new): assume 0.1% of tire stream are OTR tires (new)

average weight: 251.0 lbs 113.7 kgs

Reference: Atlantic Tire Dealers Association, Tire Weight by Size, Farm & Industry, OTR & Forestry

7. Quantities include waste generated from the Residential and ICI sector that is managed by Colchester

8. Baseline year is Fiscal 2013 (April 2012 - March 2013)

9. 2012 population from 2011 Stats Canada Census (forecasted forward 1 year based on historical % change in population)

10. Allowance to close landfill $5 /tonne

11. Current Tip Fees (2015):

Waste:	$112	/tonne
Segregated C&D:	$35	/tonne
C&D in mixed loads:	$112	/tonne
Recyclables	$0/$87.5/$142.5	/tonne

Table B4-2 - Current Conditions Scenario vs. Proposed Conditions Scenario - Tonnages & Costs - Baseline Year: 2016

COLCHESTER

										CAPITAL $ (1)	OPERATING $ (2)		REVENUE $ (3)		NET BENEFIT $ (3)-(2)-(1)	
	Material	Waste Stream	Diversion Program Responsibility	Scenario	Approx. Quantity Managed 2016 (tonnes)	Assumed % of segregated material	Quantity Segregated (Diverted) (tonnes)	Assumed % of non-segregated material	Quantity in Mixed Loads (Landfilled) (tonnes)	Incremental Capital Costs ($)	Annual Operating Costs ($)	Operating Cost per Tonne Managed ($/tonne)	Annual Revenue ($)	Tip Fee[1] ($/tonne)	Net Benefit ($)	Net Benefit Per Tonne Managed ($/tonne)
1	Asphalt Shingles	C&D	Municipality	Current Conditions	457	0		100%			$17,707	$38.75	$51,184	$112.00	$33,477	$73.25
				Proposed Conditions		80%	366	20%	91	$23,163	$21,090.13	$46.15	$23,033	$50.40	-$21,220	-$46.43
2	Carpet	C&D	EPR	Current Conditions	655	0%		100%			$25,378	$38.75	$73,360	$112.00	$47,982	$73.25
				Proposed Conditions		80%	524	20%	131		$5,076	$7.75	$0	$0.00	-$5,076	-$7.75
3	Clean Wood	C&D	Municipality	Current Conditions	1,461	50%	731	50%	731		$123,207	$84.33	$107,384	$73.50	-$15,823	-$10.83
				Proposed Conditions		60%	877	40%	584	$73,983	$117,546	$80.46	$96,134	$65.80	-$95,395	-$65.29
4	Wallboard	C&D	Municipality	Current Conditions	471	0%		100%			$18,249	$38.75	$52,752	$112.00	$34,503	$73.25
				Proposed Conditions		60%	283	40%	188	$23,854	$18,604	$39.50	$30,992	$65.80	-$11,466	-$24.34
5	HHW[2]	Waste	EPR	Current Conditions	21						$13,264	$631.62	$0	$0.00	-$13,264	-$631.62
				Proposed Conditions[2]							$0	$0.00	$0	$0.00	$0	$0.00
6-1A	PP&P[3] (OPTION 1)	Recyclables	EPR	Current Conditions - 1	9,699						$2,756,772	$284.23	$1,996,605	$205.86	-$760,167	-$78.38
6-1B	PP&P[3] (OPTION 1)			*Proposed Conditions[3] - 1	3,042						$294,092	$96.68	$0	$0.00	-$294,092	-$96.68
	Sale of the MRF (assume $ to be received in 2016)			Proposed Conditions - 1									$1,600,000		$1,600,000	
6-2A	PP&P (OPTION 2)[4]	Recyclables	EPR	Current Conditions - 2	9,699						$2,756,772	$284.23	$1,996,605	$205.86	-$760,167	-$78.38
6-2B				**Proposed Conditions - 2	10,184							$0.00		$0.00	-$152,181	-$14.94
7	Mattresses	Waste	EPR	Current Conditions	128						$15,872	$124.00	$8,730	$68.21	-$7,141	-$55.79
				Proposed Conditions							$0	$0.00	$0	$0.00	$0	$0.00
8A	Textiles	Waste	Private Sector	Current Conditions	2,319						$287,553	$124.00	$158,169	$68.21	-$129,384	-$55.79
8B				Proposed Conditions	1,878						$232,918	$100.44	$128,117	$68.21	-$104,801	-$55.79
9	Tires (OTR - new)	Waste	RRFB	Current Conditions	8						$992	$124.00	$546	$68.21	-$446	-$55.79
				Proposed Conditions							$0	$0.00	$0	$0.00	$0	$0.00
10	5% Reduction in Waste Tonnages (from increase in PPP tonnages under Proposed Conditions)			*Proposed Conditions[3] - 1	145						$17,961	$124.00	-$9,880	-$68.21	$8,082	$55.79
				**Proposed Conditions - 2	485						$60,133	$124.00	-$33,076	-$68.21	$27,057	$55.79
				Current Conditions												
11	Additional littering/open burning enforcement effort			Proposed Conditions							$2,709				-$2,709	

[1]Tip Fees:

Segregated C&D Loads (EPR Programs):	$0
Segregated C&D Loads (Municipality Responsible):	$35
Mixed C&D Loads:	$112
Waste tip fee (2015):	$112

Note: Tip fee for "Proposed Conditions" is weighted average for Items 1-4 and 8

Assumptions:

[2] 20% of HHW costs borne by municipality in Proposed Conditions Scenario

[3] 30% of PPP costs borne by municipality in Proposed Conditions Scenario (OPTION 1)

Scenario (B) New Operating Costs (2016 $)

Shingles Processing and Hauling Cost:

$48 /tonne

Wood Processing Costs:

$94,903 /year

(status quo processing costs)

Drywall Processing Costs:

$40 /tonne

Scenario (B) New Capital Costs (2016 $)

New Capital Items (Diversion Program Scenario) (2015 Expenditures)

C&D Landfill Laydown Area	$70,000	borne by Municipality
Extension to Public Drop Off	$47,000	covered by EPR
Small Quantity C&D Drop Off	$51,000	borne by Municipality

PP&P Options[4]:

Option 1: MRF Operations are taken over by EPR

Assume a sharing of overal net costs (Collection & processing)

70% borne by EPR

30% borne by Colchester

PP&P processing costs $87.5/tonne

Collection costs -- status quo

Option 2: Colchester continues MRF operation

Residential collection costs/Education costs by EPR

70% borne by EPR

30% borne by Colchester

Use current MRF net $/tonne to estimate operating costs

$6.09 /tonne

$714,145 total curbside coll'n & education costs

$214,244 30% of curbside/education costs

Table B4-3 - Operating Costs and Revenues from the Data Call (2012/13) - COLCHESTER

OPERATING COSTS

Data Call Ref Page #:	Page 2	Page 11		Page 35		46	47
	Curbside Collection	Recycling Operating Costs	Disposal Site Operating Costs	C&D Waste Processing (wood grinding)	Admin Costs	Education Costs	Totals
C&D			$50,000	$94,903			$144,903
Recyclables	$590,769	$1,828,250			$103,549	$123,376	$2,645,944
Waste	$755,219		$1,439,546		$87,413	$112,801	$2,394,979
Bulky Waste	$52,367						$52,367
HHW					$2,689	$10,575	$13,264

REVENUES

Data Call Ref Page #:	Page 13		page 37			From Darlyne		
	Recycling Revenue	Plus Revenue from RRFB for processing glass (incl. HRM glass)	Disposal Site Revenue (Residential)	Sale of Materials	Disposal Site Revenue (ICI)	Approx C&D Revenues based on new tonnages	Garbage revenues from Truro and Stewiacke	Totals
C&D						$247,251		$247,251
Recyclables	$743,099	$252,868		$920,370				$1,916,337
Waste			$4,025	$531	$1,246,654		$94,960	$1,346,170

APPENDIX B4-4
Proposed/Future Costs Scenario

Municipality/Authority: **MUNICIPALITY OF THE COUNTY OF COLCHESTER**

CAPITAL (2016 expenditures)

1) C&D Landfill Laydown Area

- Large rough graded area west of C&D landfill already in place.
- To accommodate segregation/grinding/storage of asphalt shingles, clean wood and drywall.
- Drywall pile to be tarped to minimize exposure to precipitation.
- Assume 60m x 60m aggregate surface (300 mm thick).

Item No.	Description	Unit	Estimated Quantity	Assumed Unit Price	Proposed Amount*
1	Final Grading	m^2	3,600	$ 1.00	$ 4,000
2	Geotextile	m^2	3,600	$ 3.25	$ 12,000
3	Granular Class B (300 mm)	m^3	1,080	$ 35.00	$ 38,000
				Subtotal	$ 54,000
				Contingency at 30%	$ 16,000
				Total Estimated Budget	**$ 70,000**

*: costs rounded to nearest $1000

2) Extension to Public Drop Off Structure

- Addition of two bays to current structure to accommodate two 40 cy weather protected roll offs.
- One roll off for mattresses/box springs, one for carpet.
- Assumption that mattress and carpet stewardship agencies will provide the roll offs from their own supply.
- Stewards will deliver an empty roll off when they remove a full one as part of a provincial collection system.
- Assumption that the capital cost for the extended drop off structure will be covered by the stewards.

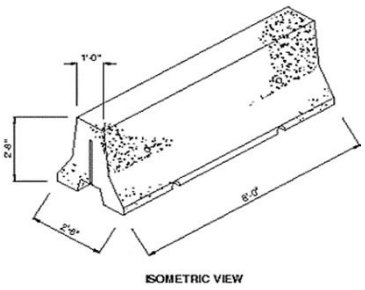
Cost for existing six bay PCSWM drop off structure	$156,000	- from 2012 PCSWM data call information including yard paving.
Assumed cost for two bay extension	$39,000	- assume 25% of original cost, larger bays to accommodate 40 yd roll offs.
Contingency at 20%	$8,000	
Total Estimated Budget	**$47,000**	

3) Small Quantity C&D Drop Off Area

- To accommodate utility trailer/pick up truck loads of C&D materials, larger contractor loads will be directed to the C&D Landfill Laydown Area.
- To be located to the north of the new public drop off area.
- To consist of a 15m x 25m asphalt pad with concrete jersey barrier separated stalls for clean wood, shingles, drywall and mixed C&D.

Item No.	Description	Unit	Estimated Quantity	Assumed Unit Price	Proposed Amount*
1	Final Grading	m^2	375	$ 1.00	$ 1,000
2	Geotextile	m^2	375	$ 3.25	$ 1,000
3	Granular Class B (300 mm)	m^3	113	$ 35.00	$ 4,000
4	Asphalt	m^2	375	$ 45.00	$ 17,000
5	Concrete Jersey Barriers (2.4m)	ea	29	$ 500.00	$ 15,000
6	Signage	LS	1	$ 1,000.00	$ 1,000
				Subtotal	$ 39,000
				Contingency at 30%	$ 12,000
				Total Estimated Budget	**$ 51,000**

*: costs rounded to nearest $1000



Jersey Barrier (typical)

Appendix B5 – Cost Information
Pictou County Solid Waste Management

PCSWM

Table B5-1 - Current Conditions - Tonnages & Costs - Baseline Year: 2012

				Tonnage Managed		Operating		Revenue	Net Cost
	Material	Waste Stream	Quantity (Generated)	Approx. Quantity Managed	Managed Waste Generation Rate	Annual Operating Costs	Operating Cost per Tonne Managed[10]	Revenue (Current Tip Fee)	**Net Cost Per Tonne Managed**
			(tonnes)	(tonnes)	kg/person/ year	($)	($/tonne)	($/tonne)	**($/tonne)**
1	Asphalt Shingles[1]	C&D	540	317	7.1	$5,460.14	$17.21	$79.81	$62.60
2	Carpet[1]	C&D	978	575	13	$9,890.42	$17.21	$79.81	$62.60
3	Clean Wood[1]	C&D	1,684	990	22	$17,033.54	$17.21	$79.81	$62.60
4	Wallboard[1]	C&D	508	298	6.6	$5,134.89	$17.21	$79.81	$62.60
5	HHW[3]	Waste	293	10	0.2	$19,233	$1,923.30	$0	-$1,923.30
6	PP&P	Recyclables	10,376	2,708	60	$984,620.00	$363.53	$133.64	-$229.89
7	Mattresses[4]	Waste	107	96	2.1	$22,755.30	$235.90	$113.18	-$122.72
8	Textiles[5]	Waste	1,465	1,187	26	$264,041.84	$222.35	$113.18	-$109.17
9	Tires (OTR - new)	Waste	4	4	0.1	$983.92	$245.98	$113.18	-$132.80

Info for Proportional Costing (weighted average)

Asphalt Shingles	9.65%
Carpet	17.48%
Clean Wood	30.10%
Wallboard	9.08%
HHW	
PP&P	
Mattresses	0.93%
Textiles	10.73%
Tires (total)	0.04%

Assumptions

1. C&D quantities generated managed by PCSWM from 2012 Data Call (provided by NSE). % breakdown of C&D quantities from Cumberland County Project/waste audit of Otter Lake Landfill.

2. Capital Cost summary table provided by D. MacQueen for Pictou County (2012)

3. Approximate HHW quantity managed from Data Call (Page 39) & Product Care Manitoba HHW 2012 Program Year Annual Report

4. Mattresses generation rate: 0.1 mattresses/person/year (Ref: Otter Lake estimates, Hfx C&D Report, CPSC Report)

average weight: 52.58 lbs 23.81874 kgs

5. Textiles

avg diversion rate: 18.92% % of textiles in MSW landfilled waste: 11%

Textiles gen rate: 0.032547598 tonnes/person/year

2012 population 44,998

(7,000 tonnes diverted, 30,000 tonnes landfilled)

Ref: Bob Kenney (Truro waste audit + data from Value Village and Charities)

	Annual Op. Costs	Annual Capital Cost[2]	Annual Revenue
C&D	$40,145	$30,339	$275,262
Recyclables	$984,620	$1,298	$394,105
Waste	$2,459,791	$164,220	$1,380,000
HHW	$19,233	$2,236	$750
		(not included in calcs)	

6. Tires (new): assume 0.1% of tire stream are OTR tires (new)

average weight: 251.0 lbs 113.7 kgs

Reference: Atlantic Tire Dealers Association, Tire Weight by Size, Farm & Industry, OTR & Forestry

7. Quantities include waste generated from the Residential and ICI sector that is managed by PCSWM

8. Baseline year is Fiscal 2013 (April 2012 - March 2013)

9. 2012 population from 2011 Stats Canada Census (forecasted forward 1 year based on historical % change in population)

10. Allowance to close landfill $5 /tonne

11. Current Tip Fees:

minimum fee:	$5	/tonne	
Waste:	$113	/tonne	
C&D	$75	/tonne	
C&D in mixed loads:	$112	/tonne	
Recyclables	$134	/tonne	

12. C&D in mixed loads incoming

88.4%	C&D	$76	/tonne
11.6%	in mixed loads:	$112	/tonne

This is a user pay site and all vehicles will be weighed. **There is a minimum $5 fee for all vehicles entering the site. Tipping fees per metric tonne are as follows: regular waste weighing 50 kgs and up will be charged $113.18 per metric tonne.** Tipping fees may be adjusted to reflect the cost of living and fuel surcharge. **Organic material is $75.79 per metric tonne, construction and demolition is $75.00, and asbestos is $200.00. Blue Bag recycling is $133.64.**

Ref: PCSWM website

Table B5-2 - Current Conditions Scenario vs. Proposed Conditions Scenario - Tonnages & Costs - Baseline Year: 2016

PCSWM

										CAPITAL $ (1)	OPERATING $ (2)		REVENUE $ (3)		NET BENEFIT $ (3)-(2)-(1)	
	Material	Waste Stream	Diversion Program Responsibility	Scenario	Approx. Quantity Managed 2016 (tonnes)	Assumed % of segregated material	Quantity Segregated (Diverted) (tonnes)	Assumed % of non-segregated material	Quantity in Mixed Loads (Landfilled) (tonnes)	Incremental Capital Costs ($)	Annual Operating Costs ($)	Operating Cost per Tonne Managed ($/tonne)	Annual Tip Fee Revenue ($)	Tip Fee[1] ($/tonne)	Net Benefit ($)	Net Benefit Per Tonne Managed ($/tonne)
1	Asphalt Shingles	C&D	Municipality	Current Conditions	320			100%	320		$5,460	$17.21	$25,540.34	$79.8	$20,080.2	$62.60
				Proposed Conditions		80%	256	20%	64	$18,972	$20,579	$64.31	$18,560.0	$58.0	-$20,991.6	-$65.60
2	Carpet	C&D	EPR	Current Conditions	579			100%	579		$9,890	$17.21	$46,212.05	$79.8	$36,321.6	$62.60
				Proposed Conditions		80%	463	20%	116		$1,993	$3.44	$10,422.0	$18.0	$8,428.9	$14.56
3	Clean Wood	C&D	Municipality	Current Conditions	998			100%	998		$17,034	$17.21	$79,653.93	$79.8	$62,620.4	$62.60
				Proposed Conditions		60%	599	40%	399	$59,186	$50,058	$50.16	$80,838.0	$81.0	-$28,406.0	-$28.46
4	Wallboard	C&D	Municipality	Current Conditions	301			100%	301		$5,135	$17.21	$24,023.88	$79.8	$18,889.0	$62.60
				Proposed Conditions		60%	181	40%	120	$17,842	$15,095	$50.15	$19,866.0	$66.0	-$13,070.9	-$43.43
5	HHW[2]	Waste	EPR	Current Conditions	10				10		$19,233	$1,923.30	$0.00	$0.0	-$19,233.0	-$1,923.30
				Proposed Conditions[2]		100%	10				$3,855	$385.46	$0.0	$0.0	-$3,854.6	-$385.46
6A	PP&P[3]	Recyclables	EPR	Current Conditions	2,731	100%	2,731		2,731		$984,620	$363.53	$364,971	$133.6	-$619,649.2	-$229.89
6B				Proposed Conditions[3]	2,868	100%	2,868	0%	0		$310,155	$108.16	$0	$0.00	-$310,155	-$108.16
7	Mattresses	Waste	EPR	Current Conditions	97				97		$22,755	$235.90	$10,978.46	$113.2	-$11,776.8	-$122.72
				Proposed Conditions		90%	97	10%	-		$0	$0.00	$0.0	$0.0	$0.0	$0.00
8A	Textiles	Waste	Private Sector	Current Conditions	1,187			100%	1,187		$264,042	$222.35	$134,400.59	$113.2	-$129,641.3	-$109.17
8B				Proposed Conditions	962	19%	226	81%	962		$213,874	$222.35	$108,864	$113.2	-$105,009.4	-$109.17
9	Tires (OTR - new)	Waste	RRFB	Current Conditions	4				4		$984	$222.35	$452.72	$113.2	-$531.2	-$109.17
				Proposed Conditions		100%	4	0%	-		$0	$0.00	$0.0	$0.0	$0.0	$0.00
				Current Conditions												
10	5% Reduction in Waste Tonnages			Proposed Conditions	137						$30,362		-$15,454.7		$14,907.45	$109.17
				Current Conditions												
11	Additional littering/open burning enforcement effort			Proposed Conditions							-$2,426				-$2,426	

[1]Tip Fees:

Segregated C&D Loads (EPR Programs):	$0
Segregated C&D Loads (Municipality Responsible):	$50
Mixed C&D Loads:	$90
Waste tip fee (2015):	$113

Note: Tip fee for "Proposed Conditions" is weighted average for Items 1-4 and 8

Textiles:

Current Diversion	19%
Future Diversion	38%

Assumptions:

[2] 20% of HHW costs borne by municipality in Proposed Conditions Scenario

[3] 30% of PPP costs borne by municipality in Proposed Conditions Scenario

Scenario (B) New Operating Costs (2016 $)

Shingles Operating Cost:

Fee to process:	$40	/tonne
Hauling Fee:	$12	/tonne
Total:	$52	/tonne

New Operator (full-time) for C&D Site:

{currently, operator works 10 hrs/week)

Add. hours:	30	hours
	$20	/hour
	$31,200	/year

Clean Wood and Wallboard Operating Costs:

Wood	$40	/tonne
Wallboard	$40	/tonne

Scenario (B) New Capital Costs (2016 $)

New Capital Items (Diversion Program Scenario) (2015 Expenditures)

C&D Laydown Area	$48,000	borne by Municipality
Extension to Public Drop Off	$47,000	covered by EPR
Small Quantity C&D Drop Off	$48,000	borne by Municipality

Table B5-3 - Operating Costs and Revenues from the Data Call (2012/13) -- PCSWM

OPERATING COSTS

Data Call Ref Page #:	Page 2	Page 15		Page 17	Page 41	Info from Carol	Page 43	Page 44			
	Curbside Collection	Tip Fees paid to Landfill	Line Hauling	C&D Operating Costs	HHW Operating Costs	HHW Trailer	Admin Costs	Education Costs	TS Operating Costs	Recycling Processing Fees	Totals
C&D				$25,295					$14,850		$40,145
Recyclables	$509,796		$42,685				$59,112	$79,808	$99,000	$194,219	$984,620
Waste	$955,370	$812,435	$191,916				$59,112	$59,808	$381,150		$2,459,791
HHW					$15,133	$4,100					$19,233

REVENUES

Data Call Ref Page #:	Page 24	Page 32	Page 45		
	C&D Debris Revenue	Transfer Station Revenue	Funding and Other Revenues	Info From PCSWM on Revenues	Totals
C&D	$232,551	$42,711			$275,262
Recyclables				$394,105	$394,105
Waste				$1,380,000	$1,380,000
Asbestos	$4,946				$4,946

APPENDIX B5-4
Proposed/Future Costs Scenario

Municipality/Authority: **PICTOU COUNTY SOLID WASTE MANAGEMENT**

CAPITAL (2016 expenditures)

1) C&D Landfill Laydown Area

- Large rough graded area east of C&D landfill already in place.
- To accommodate segregation/grinding/storage of asphalt shingles, clean wood and drywall.
- Drywall pile to be tarped to minimize exposure to precipitation.
- Assume 50m x 50m aggregate surface (300 mm thick).

Item No.	Description	Unit	Estimated Quantity	Assumed Unit Price	Proposed Amount*
1	Final Grading	m^2	2,500	$ 1.00	$ 3,000
2	Geotextile	m^2	2,500	$ 3.25	$ 8,000
3	Granular Class B (300 mm)	m^3	750	$ 35.00	$ 26,000
				Subtotal	$ 37,000
				Engineering/Contingency at 30%	$ 11,000
				Total Estimated Budget	**$ 48,000**

*: costs rounded to nearest $1000

2) Extension to Public Drop Off Structure

- Addition of two bays to current structure to accommodate two 40 cy weather protected roll offs.
- One roll off for mattresses/box springs, one for carpet.
- Assumption that mattress/box spring and carpet stewardship agencies will provide the roll offs from their own supply.
- Stewards will deliver an empty roll off when they remove a full one as part of a provincial collection system.
- Assumption that the capital cost for the extended drop off structure will be covered by the stewards.

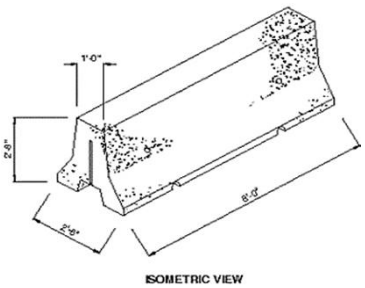
Cost for existing six bay PCSWM drop off structure	$156,000	- from 2012 PCSWM data call information including yard paving.
Assumed cost for two bay extension	$39,000	- assume 25% of original cost, larger bays to accommodate 40 yd roll offs.
Contingency at 20%	$8,000	
Total Estimated Budget	**$47,000**	

3) Small Quantity C&D Drop Off Area

- To accommodate utility trailer/pick up truck loads of C&D materials, larger contractor loads will be directed to the C&D Landfill Laydown Area.
- To be located on gravel parking area on the eastern edge of the former asbestos disposal area.
- Assumption that the area below the proposed drop off area does not contain asbestos (to be confirmed).
- To consist of a 20m x 20m asphalt pad with concrete jersey barrier separated stalls for clean wood, shingles, drywall and mixed C&D.
- The two 18 yd roll off bins at the Drop Off structure currently used for C&D would be now be designated for "blue bag" recyclables.

Item No.	Description	Unit	Estimated Quantity	Assumed Unit Price	Proposed Amount*
1	Final Grading	m^2	400	$ 1.00	$ 1,000
2	Geotextile	m^2	400	$ 3.25	$ 1,000
3	Granular Class B (300 mm)	m^3	120	$ 35.00	$ 4,000
4	Asphalt	m^2	400	$ 45.00	$ 18,000
5	Concrete Jersey Barriers (2.4m)	ea	23	$ 500.00	$ 12,000
6	Signage	LS	1	$ 1,000.00	$ 1,000
				Subtotal	$ 37,000
				Engineering/Contingency at 30%	$ 11,000
				Total Estimated Budget	**$ 48,000**

*: costs rounded to nearest $1000



ISOMETRIC VIEW

Jersey Barrier (typical)

Appendix B6

Future Operating Costs (Proposed Scenario)

Table B6
Proposed/Future Costs Scenario

Municipality/Authority: AS IDENTIFIED

OPERATION & MAINTENANCE (2016 expenditures)

Assumptions

Shingles

- Segregated, clean shingles to be maintained in a stockpile in laydown area.
- Service provided by Halifax C&D; production of shingle flake and asphalt grit product.
- Municipality to provide excavator/operator to load trailer.
- Transportation cost to Milford NS processing facility - round trip ($/hr) = $150
- Average transport speed (km/hr) = 90
- Number of tonnes per 53' trailer = 30
- Processing cost ($/tonne) = $40

Clean Wood & Drywall Processing

- Segregated, clean materials to be maintained in a stockpile in laydown area.
- Use of ground wood at on-site composting facilities (where available) or blending into final LF cover. See Note 2 for District of Chester end use assumptions.
- Use of ground drywall at designated composting facilities.
- Processing using a tub or horizontal bed grinder.
- Municipality to provide excavator/operator to load grinder.
- Operating cost; municipally-owned grinder ($/tonne) = $20
- Operating cost; contractor-owned grinder ($/tonne) = $40

General

- Costs developed through consulation with Halifax C&D and municipal contacts.

	Shingles					Clean Wood	Drywall				
Municipality[1]/ Authority	Haul Distance - Round Trip (km)	Haul Time (hr)	Haul Cost ($/tonne)	Processing Cost ($/tonne)	Total Cost/Tonne	Processing Cost ($/tonne)[3]	Processing Cost ($/tonne)	Haul Distance - Round Trip[4] (km)	Haul Time (hr)	Haul Cost ($/tonne)	Total Cost/Tonne
CBRM[2]	708	7.9	$40	$40	$80	$20	$20	N/A	N/A	N/A	$20
District of Chester	240	2.7	$14	$40	$54	$30	$40	100	1.1	$6	$46
Colchester County	132	1.5	$8	$40	$48	$40	$40	N/A	N/A	N/A	$40
PCSWM	206	2.3	$12	$40	$52	$40	$40	N/A	N/A	N/A	$40

Notes:

1. No direct C&D material services are coordinated/provided by the Town of Antigonish.
2. CBRM have their own vertical bed grinder to process wood and drywall.
3. The District of Chester's lower per tonne processing cost acknowledges the delivery of the material by the contractor to Brooklyn Energy as a fuel.
4. Assumption that CBRM, Colchester and PCSWM will utilize processed/ground drywall as an amendment at their on-site composting facilities.

Processed materials from the District of Chester will require transport to the Whynott's Settlement composting facility.

Appendix B7
Additional Littering/Open Burning
Enforcement Effort

Table B7
Proposed/Future Costs Scenario

Municipality/Authority: ALL

OPERATION & MAINTENANCE (2016 expenditures)
Additional Littering/Open Burning Enforcement Effort

From Bob Kenney - NSE, email March 11, 2015;
- estimates ~250 days provincially for NSE to address current issues of open burning, illegal dumping and littering.
- assume 20% of effort (250 x 0.2 = 50 days) was associated with incidents with "environmental impact implications", e.g., incidents that NSE will continue to respond to under the future conditions scenario.

NSE staff effort[1] (days/ year)	NS Population (2014)	NSE Staff Effort per Person (days/year)
200	940,592	0.00021

Enforcement officer salary (per year)	Benefits allowance (30%)	Enforcement Officer Cost (per year)	Expenses Allowance - 25 % Salary & Benefits (per year)	Total Enforcement Officer Cost (per year)	Total Enforcement Officer Cost (per day @ 260 days/yr)
$40,000	$12,000	$52,000	$13,000	$65,000	$250

Municipality/Authority	Population (2011)	Additional Municipal Staff Effort (days/year)	Estimated Additional Annual Enforcement Cost
Town of Antigonish	4,524	0.96	$240
Cape Breton Regional Municipality	97,398	20.71	$5,177
Municipality of the District of Chester	10,599	2.25	$563
Municipality of the County of Colchester	50,968	10.84	$2,709
Pictou County Solid Waste Management	45,641	9.70	$2,426

Notes:
1. Assumed level of NSE staff effort related to littering and open burning incidents that did not have significant environmental impact implications.

Contacts and References

CONTACTS

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