Regional Waste Management/Material Recovery Facility Study Report

PRESENTED TO

MD of Foothills No. 31
Town of Black Diamond
Town of High River
Town of Nanton
Town of Okotoks
Town of Turner Valley

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EXECUTIVE SUMMARY

Tetra Tech Canada Inc. (Tetra Tech) was retained by the Town of Okotoks to conduct a detailed review of the current waste management practices and associated system costs for the member municipalities of the Foothills Regional Services Commission (FRSC). These findings will be used to compare with the proposed changes for a regional curbside recycling collection program and construction of a new material recovery facility (MRF).

The membership of the FRSC includes the towns of Black Diamond, High River, Nanton, Okotoks, and Turner Valley, and the Municipal District of Foothills, serving a total population of approximately 60,000. The FRSC has historically been focused on waste disposal and operates the Foothills Regional Landfill and Resources Recovery Centre (Landfill) which represents the back end or final destination of the majority of material in the solid waste management system.

The front end of the solid waste management system for the FRSC Region (the Region) is managed by the member municipalities and citizens are charged accordingly. Some parts of the collection program (i.e., curbside recycling) are undertaken by private haulers and residents pay for that service separately from municipal taxes and fees. Currently, the Town of Okotoks is the only municipality that provides a mandatory curbside recycling program with several communities in the Region operating transfer stations and recycling centres/depots. In order to increase waste diversion significantly in the Region, residents require greater access to diversion services such as curbside collection of recyclables.

A regional recycling program including curbside collection of recyclables and development of a regional MRF were studied to identify capital costs, operational costs, and appropriate governance for the regional waste management system.

The total estimated cost of a regional recycling program is approximately $13 per household per month. The majority of this cost is required for collecting and transporting recyclable materials including capital costs for trucks and carts, operational costs to cover labour, fuel and maintenance, and the cost of administering the program.

A regional MRF would be designed to process 7,250 tonnes of recyclable material per year to allow for capacity to operate for approximately 20 years when the Region's population is expected to reach 100,000. Separation of single stream materials would be achieved through a multiple step process combining automated and manual sorting. These separated materials would then be marketed and sold to manufacturers to use in future products. The total estimated capital cost for MRF construction is approximately $4.4 million (CAD) or approximately $4.39 per household per month for capital and operations costs.

The administration of the regional waste management system including the recycling program could be provided through several governance models including the formation of a separate legal entity, creation of a Municipal Controlled Corporation, formation of a Part 9 Company, or enhancement of the mandate of the FRSC. The governance review indicated that enhancing the mandate of the FRSC is the preferred governance model due to the efficiency of managing all services within one organizational structure, accountability for service delivery, and support within the region.

Based on initial consultations with internal stakeholders a regional recycling program is of interest to municipalities in the Region.

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the Town of Okotoks and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the Town of Okotoks, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech Canada Inc.'s Services Agreement. Tetra Tech's General Conditions are provided in Appendix A of this report.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by the Town of Okotoks to conduct a detailed review of the current waste management practices and associated system costs for the member municipalities of the Foothills Regional Services Commission (FRSC). These finding will be used to compare with the proposed changes for a regional curbside recycling collection program that includes a new material recovery facility (MRF).

This report includes the following:

- Summarizes the information gathered as it pertains to each member municipality.
- Provides an overview of member municipality staff feedback.
- Includes conceptual design and estimated costs for a MRF.
- Estimates costs for implementing a region wide curbside recycling collections program.
- Provides recommendations for a regional rate structure for each member municipality.
- Discusses potential changes to the current governance structure.

1.1 Project Objectives

The overall project has been broken into three main phases:

- Phase 1 – Data Gathering and System Design Assessment
- Phase 2 – Stakeholder Consultation
- Phase 3 – Reporting and Recommendations

This report includes the following project objectives:

- Summarize all background information available to prepare a comprehensive summary of waste management practices and costs in the region.
- Prepare conceptual design and cost estimates to design, build and operate a MRF at the Foothills Regional Landfill.
- Provide a list of considerations for the review of the existing governance structure to examine options to operate and fund the proposed program and infrastructure.
- Conduct a business case that compares existing services and costs against regional resources for residential waste and recycling collection.
- Recommendations for a regional rate structure for each member with regards to their solid waste and recycling services.
- Recommendations that could apply to each member municipality to adjust to a new service delivery model based that includes regional curbside recycling collection and MRF processing.
- Summary of financial and service level impacts.

- Considerations for the organizational and governance structures.
- Considerations for an implementation plan based on the recommendations presented in the report.

1.2 Background

The FRSC is a separate legal entity that provides waste disposal services for its members which include the towns of Okotoks, High River, Turner Valley, Black Diamond, and Nanton, and the Municipal District of Foothills, serving a total population of approximately 60,000. The FRSC operates the Foothills Regional Landfill and Resource Recovery Centre (Landfill) and is funded primarily by tipping fees. The FRSC represents the back end of the solid waste management system.

The front end of the solid waste management system for the FRSC Region (the Region) is managed by the member municipalities and citizens are charged accordingly. Some parts of the collection program (i.e., curbside recycling) are undertaken by private haulers and pay for that service separately. Currently, the Town of Okotoks is the only municipality that provides a curbside recycling program.

Several communities in the Region operate transfer stations and recycling centres/depots, which accept various recyclables, some organic wastes, and household hazardous wastes. Each municipality manages these materials differently and that results in many households having limited access to and varying understandings of recycling and/or waste diversion.

The following is a summary of previous work that are relevant to the project objectives.

1.2.1 Town of Okotoks – Resource Recovery Plan

In 2009, the Town of Okotoks (the Town) prepared a comprehensive resource recovery plan that was based on a "Zero Waste" philosophy and embraced responsible solid waste management. In doing so, the Town assessed the existing waste management system and programs, analyzed the characteristics of the waste stream, evaluated funding programs, and updated policies and programs. The result was an Action Plan that has four specific strategies:

- Expanded recycling strategy;
- Organic waste diversion strategy;
- Construction and demolition waste diversion strategy; and
- Awareness, accountability and reporting strategy.

Specific policies and programs were developed as part of each strategy. The long-term waste diversion potential from the implementation of the proposed strategies was estimated to be in the order of 10,000 tonnes per year, which was roughly a third of the total waste stream.

1.2.2 Town of Okotoks – 2020 Waste Management Plan

The Town of Okotoks (the Town) 2020 Waste Management Plan (the "2020 Plan") was approved in principle by the Town's Council on December 15, 2014. The 2020 Plan was prepared based on the Town's commitment to reduce waste and maximize the lifespan of the Foothills Regional Landfill. As such, the 2020 Plan renewed the Town's commitment to working towards an 80% waste diversion rate by 2020.

In 2014, the Town reported that its solid waste streams consist of waste from three sectors: single family residential (26%), institutional, commercial and industrial (ICI) (29%), and construction and demolition (C&D) (45%). It is important to recognize that C&D sector typically makes up about 30% of the waste stream in most communities.

The Town has the greatest control over the residential stream given that it owns and operates the waste collection system. The 2014 diversion rate for the residential sector was reported to be 38%. The Town recognized that removal of organic waste from the garbage stream will have the greatest impact on the residential waste diversion rate as organic waste represents between 42% and 56% of traditional household garbage. This acknowledgement helped identify that the town must advance its waste management strategies over the next five years to begin to obtain its target.

The 2020 Plan includes progressive ICI and C&D sector waste diversion strategies. Waste from these sectors make up more than 70% of the waste landfilled in the region. The Town recognized that successful implementation of the strategies will require collaboration with its regional partners to develop a regional material processing facility and programs. Partnerships and commitments are essential to the long-term financial and environmental sustainability of the municipal waste management program.

Key strategies summarized from the 2020 Plan include the following:

- Advocate, lead and promote the development of a regional MRF at the Foothills Regional Landfill or an alternate central location;
- Revise the utility rates to incentivize or reward waste diversion activities;
- Evolve the Town's subscription based residential curbside recycling program to a universal residential wide program;
- Implement a universal residential wide organic waste collection service;
- Implement a bylaw for multi-family and ICI sector facilities to provide recycling and organic waste collection services;
- Evolve the Town's Recycling Centre into an Eco Centre which provides a "one stop" location for recycling and safe disposal of excess and niche materials; and
- Progress C&D waste management initiatives.

To date, many of these strategies have been or are being implemented.

1.2.3 FRSC 2014 Recycling MRF/Transfer Station Study

In November 2014, CH2M Hill completed an assessment, for the FRSC, of options for processing recyclable material from the region. The study completed a review of existing collection and processing facilities for each municipality and historical quantities of material diverted through each municipal program. Six scenarios were assessed which includes the following:

- Scenario 1: Regional transfer station at the landfill and off-site processing at a contracted private sector MRF.

ORGANIC WASTE MANAGEMENT

Collecting and processing of organic waste from the residential sector will target between 42% and 56% of the material in household garbage.

- Scenario 2A: Regional transfer station at the Municipal District (MD) of Foothills Public Works Yard (Aldersyde) and off-site processing at a contracted private sector MRF.
- Scenario 2B: Regional transfer station at a new Aldersyde property and off-site processing at a contracted private sector MRF.
- Scenario 3: On-site processing at a MRF at the landfill.
- Scenario 4A: On-site processing at a MRF at the MD of Foothills Public Works Yard (Aldersyde).
- Scenario 4B: On-site processing at a MRF at a new Aldersyde Property.

Assumptions were made regarding harmonizing waste collection from each community, and converting the existing drop-off recycling programs in the towns of High River, Nanton, and Turner Valley to single stream curbside collection programs.

The study focused on the projected capital and operating costs for each scenario. The highest cost option was associated with Scenario 4B, which includes siting the MRF on new land as opposed to using existing land owned by the FRSC (landfill or Public Works Yard). A significant difference in cost was found between developing a regional transfer station and developing a MRF, with significantly higher capital costs associated with the development of a MRF in the region.

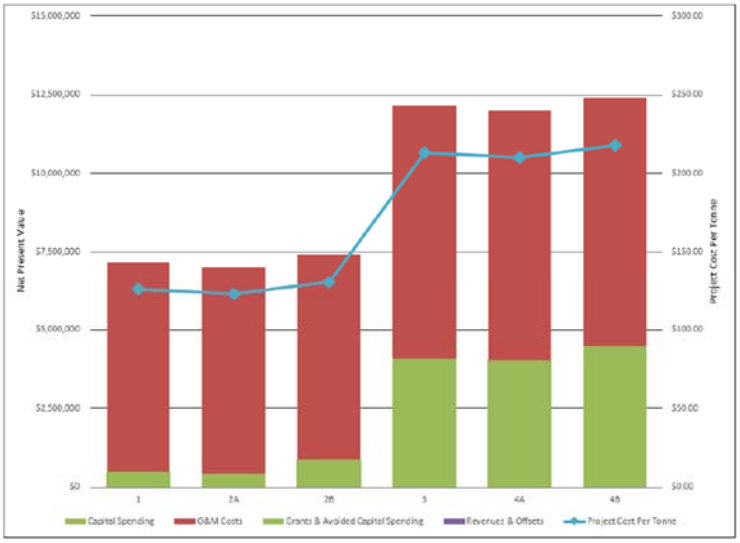


Figure 1: Financial Comparison of Scenarios

1.2.4 Town of High River – Solid Waste Diversion Study

In March 2010, sonneverra international corp. (sonneverra) completed a solid waste diversion study for the Town of High River. It was reported that in 2009 the Town of High River adopted a new town plan that presented a sustainability plan in relation to the economy, the environment and social and cultural development. Two of the components of the town plan included goals for enhancing the natural environment, and for future growth and development of the Town of High River. These two elements include related policies such as promoting waste management awareness, preparing and implementing a sustainability plan, reviewing the existing waste management practices and identifying ways of managing the waste stream in a more environmental sustainable manner, and initiating and participating in joint capital projects with neighboring municipalities and the provincial government for the provision of cost-effective and environmentally sustainable municipal services, transportation systems and institutional facilities; all key goals which agree with the Town of Okotoks 2020 Plan.

Based on these goals, an implementation plan was developed to build a progressive waste reduction program. Among others, the plan included establishing a waste reduction vision that will provide guidance for program development and implementation going forward and establishing a curbside recycling collection program.

2.0 EXISTING SOLID WASTE MANAGEMENT SYSTEM

The following subsections describe the current service levels for the solid waste management system. Summaries were prepared based on, waste management personnel interviews, site visits, and internet web searches. Details of each municipality are discussed in Appendix B (Community Profiles).

2.1 Foothills Regional Services Commission

The FRSC was established in 1989 by the Province of Alberta at the request of the towns of Okotoks and High River, and the Municipal District of Foothills No. 31 (MD of Foothills). In 1992, the Commission was expanded to include the towns of Turner Valley and Black Diamond. Nanton became part of the FRSC in 2001. The FRSC consists of one Municipal Council representative from each municipality which includes MD of Foothills and the towns of Okotoks, High River, Black Diamond, Turner Valley and Nanton (Town of Okotoks 2016).

The FRSC is responsible for the operation of the Landfill and the Frank Lake Effluent Pumping Station. The Landfill is funded by user tipping fees.

2.2 Foothills Regional Landfill and Resource Recovery Centre

2.2.1 Facility Description

The Landfill (Figure 1) operates under Alberta Environment and Parks (AEP) Approval No. 47447-02-00 which was effective on August 28, 2014 and expires on August 1, 2024 (Foothills Regional Service Commission 2015 Annual Report). The Landfill is a Class II facility located on Highway 783, 5.5 km south of Highway 7 and 5 km North of Highway 543. (SE-32-19-29-W4M). It is located on a 64 hectare parcel of land. There is approximately 90,000 tonnes of waste landfilled annually. Current airspace projections indicate that the Landfill's remaining lifespan is 64 years.

In addition to receiving waste for disposal, the Landfill also accepts divertible materials such as scrap metal, appliances, batteries, tires, used oil, propane bottles, antifreeze, oil filters, cardboard, appliances, wood waste and greens pile (compost), and household hazardous waste.

Figure 2: Aerial photo of Foothills Regional Landfill and Resource Recovery Centre

In 2014, the majority of the waste received at the Landfill was C&D waste, which includes wood, clean wood (unpainted, unstained, and untreated wood), clean drywall, concrete rubble, clean concrete, asphalt, and clean shingles. Due to the 2013 Alberta Floods, the amount of C&D waste generated in the region increased significantly in 2013 and 2014.

Leaves and other organic yard wastes are accepted at the Landfill for windrow composting. The Landfill receives approximately 4,000 tonnes per year of leaf and yard waste, and sells the finished compost along with selected other materials for landscaping and soil amendment. Biosolids and food scraps are not currently accepted for composting due to potential odour concerns.

2.2.2 Funding Program

Revenue to fund the Landfill is primarily from user fees (such as tipping fees). In 2015, the annual revenue was just above $6.0 million and the annual operating expenditures was in the order of $3.0 million. The surplus collected was placed into reserves to account for non-financial assets and Landfill liabilities such as associated closure costs.

Table 1 below lists the Landfill disposal rates, as of January 2016.

Table 1: Foothills Regional Landfill and Resource Recovery Centre – Tipping Fees

Material Description		Tipping Fees (per tonne)
General		
Residential Waste from Member Municipalities		$65.00
Commercial Haulers & Self Haulers	0 kg to 100 kg	$10.00
	Over 100 kg	$90.00
Mixed Recycling, Cardboard and Yard Waste		$70.00
Construction and Demolition		
Construction & Demolition		$150.00
Asphalt Shingles		$90.00
Wood		$65.00
Clean Wood and Concrete		$50.00
Drywall, Asphalt and Metal		$70.00

Source: 2016 Foothills Regional WMF Rates (FRSC 2016)

2.2.3 Waste Received

In 2015, the Landfill received 88,691 tonnes of waste, of which 49,865 tonnes (56%) was landfilled and 38,826 tonnes (44%) was either diverted or used as cover material (FRSC 2015).

Table 2 shows the amount of waste received at the Landfill in 2015, and the waste generated by sector. Based on the information provided, typically about 15% to 20% of the waste comes from the commercial sector.

Table 2: Foothills Regional WMF – Waste Received in 2015

Sector	Material Received in 2015 (tonnes)	Proportion
Residential	34,931	39%
Commercial	15,020	17%
Construction and Demolition (C&D)	28,777	33%
Industrial (Oil and Gas)	9,963	11%
Total	**88,691**	**100%**

2.2.4 Foothills Salvage and Recycling Society

The Foothills Salvage and Recycling Society (FSRS) is a non-profit society dedicated to keeping usable and recyclable items out of the landfill and to ensure that these items are accessible and affordable for those who need them. The FSRS collects a variety of items including household goods, clothing and furniture.

Figure 3: Salvage Centre. (Photo Tetra Tech)

The FSRS is located on land donated by the Landfill. The Landfill also funded the construction of the buildings used for the operations, but is being paid back by the FSRS annually at a low interest rate.

The facility has been expanded several times on the site because of the success in returning goods to useful service. It has become very popular in the local community and is locally well regarded. There have been other similar approaches adopted at other landfills in Canada, but this one has achieved particular success with their approach.

2.2.5 Service Area

The service area for the FRSC is illustrated on Figure 4. This provides a perspective on where the member municipalities are located relative to the Landfill.

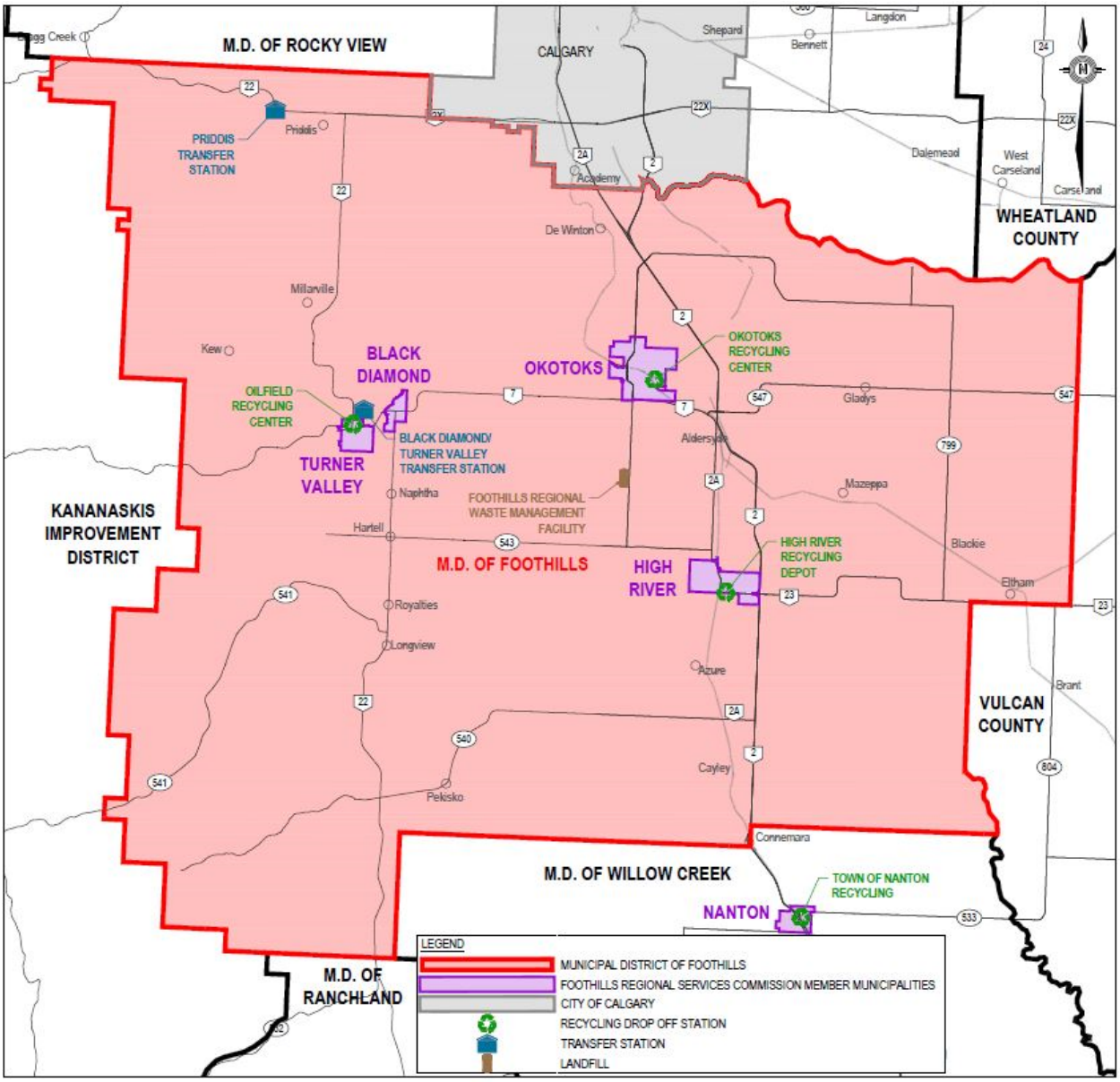


Figure 4: Regional Map Showing Key Waste Management Infrastructure

Source: Foothills Regional Service Commission Annual Report, 2015.

2.3 Municipal District of Foothills

The MD of Foothills is located directly south of Calgary as shown on Figure 4. The reported 2015 population was 21,258 people occupying 7,643 private households (Statistic Canada 2013).

Most of the residents (approximately 20,000) do not have municipal garbage collection services. These residents will either contract with a private hauler to collect their waste or take their waste to one of the two transfer stations located in the MD (listed in Table 3). The proportion of households with private waste collection contracts is unknown.

Because of historical arrangements, the MD collects from 400 households living in the communities of Blackie, Cayley, and Silvertip. The MD has a contract with a private sector waste hauler (Contain-A-Way Waste Management) who provides weekly garbage collection. The MD charges these residents $28.84 bimonthly ($14.42 per month) for garbage collection services.

Transfer stations in the MD of Foothills only accept garbage in purchased bags. The transfer stations do not accept recyclable materials. The bags can be purchased at the Millarville General Store, Hi Ho in Turner Valley, the Esso in Black Diamond or at the transfer stations.

Table 3: Transfer Stations – Location and Hours of Operation

Transfer Station	Location	Hours of Operation
Black Diamond/Turner Valley	168 St. West and 402 Avenue	Friday and Saturday from 10:00 a.m. to 4:00 p.m.
Priddis	264 St West and 178 Ave	Tuesday and Saturday from 10:00 a.m. to 4:00 p.m.

The MD shares in the cost of operating the recycling depots in the towns of High River, Turner Valley, and Okotoks, and this allows MD residents access to their recycling depots.

2.4 Town of Okotoks

The Town of Okotoks is situated along the Sheep River approximately 20 km south of the City of Calgary. The 2015 population was 27,331 as reported in the FRSC 2015 Annual Report (FRSC 2015). Based on Canadian census data, population increase from 2006 to 2011 was 42.9%. In 2011, the Town of Okotoks had 8,704 households (Statistic Canada 2012).

In 2014, 26% of the total solid waste generated in the Town of Okotoks was residential waste, 29% was IC&I waste, and 45% was C&D waste. The C&D sector had the highest contribution of waste likely because of the growth of the town. The ICI and C&D sectors are serviced by private sector haulers.

As of October 2016, the Town of Okotoks provides all single-family household residents with a mandatory waste, recycling and organics collection service. Residents are provided with 120 L capacity bins for organics and waste, and 240 L capacity bins for recyclables. Residents are charged $20.50 per month for these services, which includes all three carts.

Residents can request a larger garbage bin (180 L capacity) for an additional $6.00 per month. Residents who have additional waste can also purchase yellow waste bag (available at Sobeys, Safeway, the Municipal Centre or the Recreation Centre) for $4 per bag.

Organic waste is collected every other week in the winter (November to April) and weekly during the rest of the year (May to October). Recyclables and waste are collected weekly throughout the year.

In 2015, approximately 1,100 tonnes of curbside recyclables was collected. These materials were taken to a private sector MRF in Crossfield where they were baled and marketed.

Yard waste is managed through drop-off facilities and a curbside collection program called the "Cut 'n' Call Program". Leaves and grass are collected from households through pre-purchased yard waste collection bags. Bags can be purchased at the Municipal Centre, Operations Centre, Okotoks Recreation Centre, Safeway or Sobeys at a cost of $3 per bag. The bagged yard waste is collected weekly for the duration of the seasonal program. In 2015, the Town of Okotoks collected 755 tonnes of yard waste that was then hauled to the Foothills Regional Landfill for composting. Residents can register their pick-ups requests online or by phone.

The Town of Okotoks operates the Okotoks Eco Centre (Eco Centre) for the waste that is not collected within the curbside recycling program [i.e., household hazardous waste (HHW), CFL bulbs, electronics, etc.]. The Eco Centre also serves as a drop-off depot and processing site for residents who do not subscribe to the curbside recycling collection program including multi-family residents, as well as the IC&I and C&D sectors, and surrounding communities.

2.5 Town of High River

The Town of High River is located 37 km south of the City of Calgary. In 2015, the population was 12,920 based on Canadian census data, and the population grew by 20.6% from 2006 to 2011. In 2011, High River had 5,473 total private households (Statistic Canada 2012).

The Town of High River operates a garbage collection service using side load automated trucks. Waste is hauled to the Foothills Regional WMF. Residents are charged for this service based on garbage cart sizes: 240L ($10.10 monthly) and 360L ($14.00 monthly). Garbage is collected weekly on Tuesday, Wednesday, Thursday and Friday.

The Town of High River Recycling Depot is located in the northern portion of the town. The depot accepts mixed paper, newsprint, tin cans, cardboard, mixed plastics, cell phones, batteries, and electronics. Recyclable materials from the recycling depot are collected by Contain-A-Way Waste Management three to four times a week and hauled to the Cascades Recovery Inc. (Cascades) MRF in the City of Calgary. Electronics are collected through Recycle Logic. The depot is staffed by two full time staff members.

Yard waste (including grass clippings, leaves, and branches) are accepted at yard waste drop-off station located near the recycling depot, where it is them taken to the regional WMF.

2.6 Town of Black Diamond

The Town of Black Diamond is located on Highway 22, approximately 3 km west of Turner Valley and 68 km southwest from the City of Calgary. In 2011, the population was 2,373 people (Statistics Canada 2012). Based on Canadian census data, the population increased by 24.9% from 2006 to 2011. In 2011, the Town of Black Diamond had 1,001 total households. Most people commute to work in the City of Calgary or other surrounding communities.

The Town of Black Diamond operates an automated garbage collection system. The residents are provided with one 240 L capacity cart for the collection of waste. The cost for residential garbage collection is $10.22 monthly (charged $20.44 bimonthly) and residents are charged on their residential utility bills. The towns of Black Diamond and Turner Valley share a garbage collection truck. Garbage collection in the town normally takes place on Thursdays and Fridays. No waste composition studies have been conducted in the Town of Black Diamond.

The towns of Turner Valley and Black Diamond share the operations cost of the Oilfields Recycling Centre. According to the Town of Turner Valley website, the Oilfields Recycling Centre services the towns of Turner Valley and Black Diamond, the Village of Longview, and the MD of Foothills. The Oilfields Recycling Centre is located in the Town of Turner Valley which operates the centre. Black Diamond residents pay for their access to the Oilfields Recycling Centre through their utility bills. The recycling fee for this service is $4.61 monthly (charged $9.22 bimonthly). A private contractor (T&T Disposal Services Ltd.) operates a weekly curbside recycling collection service. T&T Disposal Services Ltd. charges $20 per month to collect recycling material from the 34 subscribed households (3.4% of households).

2.7 Town of Turner Valley

The Town of Turner Valley is located 3 km west of Black Diamond and approximately 60 km southwest of the City of Calgary. In 2011, the population was 2,167 (Statistics Canada 2012). Based on Canadian census data, the population increased by 13.6% from the 2006 to 2011. In 2011, the Town of Turner Valley had 934 total households (Statistic Canada 2012).

The Town of Turner Valley provides automated curbside garbage collection to residents. Garbage is collected weekly on Tuesdays or Wednesdays. The cost of residential garbage collection is $21 bimonthly ($10.50 monthly). This fee covers the collection fee and the tipping fee from the landfill. It should be noted that the waste bins provided to the residents are blue, which is typically associated with recycling bins. The bin colors should be standard throughout the region.

The towns of Turner Valley and Black Diamond share in the cost of operating the Oilfields Recycling Centre. The recycling centre is located in the Town of Turner Valley. The recycling fee is $6 monthly ($12 bimonthly). The Oilfields Recycling Centre accepts newsprint, white bond paper, corrugated cardboard, clear glass, cell phones, hard and soft plastics, electronics, and clothing donations. Capital Paper collects almost all the recyclable material from the centre. Electronics are collected through Recycle Logic, which is administered by ARMA. T&T Disposal Services Ltd. charges $20 per monthly to collect recycling material from the 19 subscribed households (2% of households).

2.8 Town of Nanton

The Town of Nanton is located 80 km south of Calgary, at the junction of Highway 2 and Highway 533. In 2011, the population was 2,132 with 957 households (Statistics Canada 2012). Based on Canadian census data, the population increased by 3.7% from the 2006 to 2011.

The Town of Nanton provides weekly manual garbage collection. Each residence is permitted three bags of garbage that are contained in a covered receptacle. The cost of residential garbage collection is $11 monthly (charged $22 bimonthly) and is charged on the utility bill. Excess garbage tags are available for $2.00 each. Garbage is collected every Monday by Progressive Waste Solutions Ltd. and disposed at the Foothills Regional Landfill.

The Town of Nanton is only responsible for residential garbage.

The Town of Nanton offers the following “Special Collection Programs” free of charge:

- Spring clean-up (once a year);
- Tire collection;
- Tree branches, leaves, grass; and
- Electronics (all year).

The Nanton Recycling Depot was established in 1978. The Town of Nanton assumed operations of the Nanton Recycling Depot seven years ago. The Nanton Recycling Depot receives materials about 200 vehicles per day resulting in a stable volume of recyclables every year. The depot collects cardboard, tin cans, newspapers and magazines, mixed paper, rigid plastic containers (labelled #1, #2, and #4 only), plastic milk jugs, telephone books and catalogues. The cost of the recycling depot is at $2.50 monthly (charged to households at $5.00 bimonthly).

The depot has a cardboard compactor and a 25 year old baler, which has the capacity of producing 30 bales per month. Each bale is about 1,000 lbs. Capital Paper collects the cardboard bales and send them to Oregon for recycling. Other paper and plastics are also collected by Capital Paper. Glass is not recycled because of its low value. Tires are collected through ARMA programs. Used oil is also accepted at the depot; however, there is currently no contract in place for processing of this material.

2.9 Summary of Solid Waste Management System

2.9.1 Solid Waste Generation

In 2015, total waste generation from the residential sector was 34,709 tonnes as shown in Table 4. High River has experienced unusually high solid waste generation rates following the 2013 Alberta Floods which are not expected to persist in the long term.

Table 4: Solid Waste Generation by Municipality

Municipality	Population (2015)	Total MSW Disposed (2015)	Tonnes / Capita
MD of Foothills	21,258	8,608	0.40
Town of Okotoks	27,331	11,735	0.43
Town of High River	12,920	11,291	0.87
Town of Black Diamond	2,373	1,227	0.52
Town of Turner Valley	2,167	1,098	0.51
Town of Nanton	2,132	748	0.35
Total	**68,181**	**34,709**	**0.51**

2.9.2 Service Level Summary

Solid waste management programs in each municipality comprise of different services. Waste is collected either at the curbside by a private company, by the municipality or a central drop-off location:

- **Private Collection Service**: The private sector collects wastes directly from customers. Contracts are typically managed on a municipal level if the service is provided to all residents or on an individual subscription basis if the service is optional. Due to tipping fee incentives, wastes from FRSC member municipalities are disposed of at the Foothills Regional Landfill.
- **Public Collection Service**: The municipality collects waste from residents using municipally owned vehicles, and their staff. Waste collected is disposed at the Foothills Regional Landfill.
- **Drop-off Service**: Residents haul their waste materials to a centralized collection point such as a transfer station where materials are stockpiled until sufficient quantities have accumulated for efficient transport to the Foothills Regional Landfill for disposal or processors for waste diversion.

Table 5 and Table 6 below summarize the garbage and recyclable material collection programs available by municipality.

Table 5: Garbage Collection Summary

Municipality	Collection Provider	Container Type	Curbside Collection Technique	Waste Collection Frequency
MD of Foothills	Municipal (contracted out for 2% of households)1	Cart	Automated	Weekly
	Drop-off	N/A	-	-
	Private	N/A	N/A	N/A
Town of Okotoks	Municipal	Cart (120L & 180L)	Automated	Weekly
Town of High River	Municipal	Cart (240L & 360L)	Automated	Weekly (Tuesday, Wednesday, Thursday and Friday)
Town of Black Diamond	Municipal	Cart (240 L)	Automated	Weekly (Thursday and Friday)
Town of Turner Valley	Municipal	Cart (240 L)	Automated	Weekly (Tuesday and Wednesday)
Town of Nanton	Municipal (contracted out)	Bag	Manual	Weekly (Monday)

[1] Note: MD of Foothills does not collect municipal garbage pick-up for residents except for the 2% of residents living in Blackie, Cayley and Silvertip.

Table 6: Recyclable Collection Summary

Municipality	Collection Type	Container Type	Curbside Collection Technique	Drop-off Facility	Recycling Collection Frequency
MD of Foothills	Drop-off	Drop-off	N/A	High River, Black Diamond and Okotoks	N/A
Town of Okotoks	Municipal	Cart (240L)	Automated	Okotoks Eco Centre	Weekly
Town of High River	Drop-off	N/A	N/A	High River Recycling Depot	N/A
Town of Black Diamond	Private/subscription (3% of households)	Cart	Automated	Oilfield Recycling Centre	Weekly
	Drop-off	N/A	N/A	Oilfield Recycling Centre	N/A
Town of Turner Valley	Private/subscription (2% of households)	Cart	Automated	Oilfield Recycling Centre	Weekly
	Drop-off	N/A	N/A	Oilfield Recycling Centre	N/A
Town of Nanton	Drop-off	N/A	N/A	Town of Nanton Recycling	N/A

2.9.3 Financial Summary

Fees for waste and recycling programs are collected through utility bills for most residents of the region. Residents living in towns that have garbage collection service tend to pay through utility bills. For the few households in the towns of Black Diamond and Turner Valley whose residents subscribe to the private curbside recycling collection service, the transaction and planning is directly with the contractor.

Those residents either without collection services or requiring additional capacity purchase colour coded bags to allow them to access transfer stations. Disposal costs are built into the costs of the various types of bags available at local retailers.

Access for MD of Foothills residents to various recycling depots in the region (Oilfields Recycling Centre, High River Recycling Depot, and Okotoks Eco Centre) are granted through inter-municipal agreements between the MD of Foothills and the municipalities that operate the facilities.

Table 7 below summarizes the monthly cost for garbage, recycling and organic collection services for residents by municipality.

Table 7: Household Garbage and Recycling Fees by Municipality

Municipality	Curbside Collection			Recycling Drop-off	Garbage Drop-off
	Garbage (monthly)	Recycling (monthly)	Organics (monthly)	Recycling Centres (monthly)	Transfer Station
MD of Foothills	$14.42	-	-	Free	$2.00 per bag
Town of Okotoks	120L ($10.00) 180L ($16.00)	$7.25	included	$3.25	$4.00 per bag
Town of High River	240L ($10.10) 360L ($14.00)	-	-	$2.50	$2.00 per bag
Town of Black Diamond	$10.22	$20.00	-	$4.61	$2.00 per bag
Town of Turner Valley	$10.50	$20.00	-	$6.00	$2.00 per bag
Town of Nanton	$11.00	-	-	$2.50	$2.00 per bag

3.0 RECYCLING PROGRAM ANALYSIS

The following sections provides an overview of recycling programs that are available ranging from a centralized drop-off model to various forms of curbside collection.

3.1 Overview of Recycling Programs

The objective of a recycling program is to recover as much material as possible and to divert this material away from disposal to a landfill. The success of a recycling program is subject to many factors beyond merely the adoption of any particular recycling method. The efficacy of any specific program depends on such factors as past and currently accepted practices, public education programs, and program implementation plans. As it applies to recycling programs in Canada, effective programs are formed by many interconnected systems and processes that are supported sufficiently by elected officials and residents. For example, the provision of a curbside recycling program (whether single or dual stream) is only the first step in diverting material. In order for materials collected through recycling programs to find beneficial end uses through commodity markets an acceptably low level of contamination is required. Residents must be educated clearly and frequently of what is and is not acceptable in the program. Education and enforcement of the program rules must be regularly and consistently applied and supporting tools (monetary and non-monetary) must be provided to encourage participation. The success, or lack thereof, of any recycling program depends on the degree to which a municipality adopts and implements practices, and caters to public needs and priorities.

Several approaches to collection of recyclables are discussed in the subsequent sections. Centralized drop-off points or depots currently exist in the region. This approach is typically well understood by residents, and is a low cost approach that typically does not result in high diversion. Dual stream curbside recycling collection exists in municipalities outside of southern Alberta (frequently in southern Ontario) and requires some effort from residents to separate materials at home but does not require them to haul materials to a centralized location resulting in greater material capture than depots and more potential for revenue recovery through commodity markets than

single stream recycling. Single stream curbside recycling currently exists for a limited number of homes in the towns of Okotoks, Black Diamond, and Turner Valley and several other municipalities in Alberta.

3.1.1 Source Separated (Multi-Stream) Recycling

Generally speaking, there are two options for recycling collection systems: source separated or single stream recycling. As detailed below, Recycling Drop Offs/Depots and Dual Stream Recycling are examples of multi-stream recycling. Single stream recycling is addressed in Section 3.1.2.

Figure 5: Multi-Stream Collection

In source separated or multi-stream recycling collection, waste producers (households or organizations) are required to separate their recyclable materials into two or more separate bins. This separation may occur at the generation location (home, business, or institution) for curbside collection or at the collection location for drop-offs/depots. Curbside collection of source separated recycling typically requires collection vehicles that have separate compartments for each material stream collected. In most jurisdictions, curbside collection for source separated recycling is conducted manually. Due to a low level of contamination, source separated recycling MRFs require less mechanization than those for single stream recycling. This results in lower processing costs for materials and enhanced opportunities to sell materials on commodity markets to recoup some costs.

3.1.1.1 Recycling Drop-off/Depots

Recycling depots or drop-off centres are typically located in centralized locations where residents can discard their recyclable materials. Some materials require pre-processing such as breaking down boxes, crushing cans, etc. Depots typically require residents to separate material streams including:

- Metals (Ferrous and Non-Ferrous)
- Rigid Plastics
- Mixed Plastics
- Mixed Paper (Newspaper, Magazines, Office Paper, Boxboard)
- HDPE and PET
- Cardboard (Corrugated Cardboard).

Materials that are typically not collected in curbside recycling programs but collected at depots (if staffed and secured) include the following:

- E-Waste
- Used Oil
- Propane Tanks
- Used Batteries
- Used Tires
- Appliances.

Materials at depots are typically placed in dumpster-sized containers or roll-off bins. In communities/municipalities with recycling depot, material recovery and overall diversion is considerably lower than curbside programs but the quality of the material streams tend to be high due to its low contamination rates.

For this Region, recycling depots are located in or near the major communities and at the Foothills Regional Landfill and Resource Recovery Centre as outlined in Table 8 below.

Table 8: Existing Recycling Drop-off Stations or Depots

Community	Depot or Drop-off Name	Location
Town of High River	High River Recycling Depot	640 – 7 Street NW, High River
Town of Turner Valley and Town of Black Diamond	Oilfield Recycling Centre	108 Royal Avenue N.E. (East of the firehall), Turner Valley
Town of Okotoks	Okotoks Eco Centre	400 – 1118 North Railway Street, Okotoks
Town of Nanton	Town of Nanton Recycling	1914 – 19 Avenue, Nanton
MD of Foothills	Foothills Regional Landfill and Resource Recovery Centre	on Highway 783 (16 Street E.), 5.5 km south of Highway 7, 5 km north of Highway 543

3.1.1.2 Dual Stream Curbside Recycling

Dual stream recycling, is a system whereby recyclable materials are sorted by the resident into two separate 'streams' or categories: (1) Fibre products (newspaper, cardboard, boxboard, mixed papers) and (2) Mixed containers (metals, plastics and glass). The collection program can be bag, box or cart based. There are variations in dual stream programs in terms of how and when the materials are collected. One way is to collect the fibres and containers in the same vehicle which as two separate compartments. This is referred to as co-collection and offers collection cost savings advantages. Another way is to collect the fibres and containers on alternating weeks and collect the material via either a dedicated, single compartment truck or co-collect the material with another material type, such as garbage or organics.

Dual stream recycling can result in less contamination than single stream recycling but can result in higher collection costs. This program type typically requires less processing, than single stream, to prepare materials for market but program participants must spend more time and effort in separating materials than in single stream programs.

3.1.1.3 Single Stream Recycling

Single stream recycling, also known as a co-mingled program, is a system that allows recyclables to be placed in one 'comingled' container, meaning the various fibre and container materials are placed together in the same receptacle (bag, box or cart). The materials are picked up at the curb, deposited in the same compartment on the collection vehicle and delivered to a MRF for processing. Single stream MRFs are designed to separate the various material categories using a combination of mechanical and manual sorting methods. Generally, MRFs with more automated mechanical features are higher in capital costs but have lower operating/staffing costs.

Figure 6: Collection Carts

Table 9: Summary of Recycling Programs in Member Municipalities

Municipality	Collection Method	Program Type	Curbside Collection Technique	Recycling Collection Frequency
MD of Foothills	Drop-off	Source Separated	N/A	N/A
Town of Okotoks	Curbside	Single Stream	Automated	Weekly
	Drop-off	Source Separated	N/A	N/A
Town of High River	Drop-off	Source Separated	N/A	N/A
Town of Black Diamond	Curbside1	Single Stream	Automated	Weekly
	Drop-off	Source Separated	N/A	N/A
Town of Turner Valley	Curbside1	Single Stream	Automated	Weekly
	Drop-off	Source Separated	N/A	N/A
Town of Nanton	Drop-off	Source Separated	N/A	N/A

[1] Note: Curbside recycling is available through a private contractor in the Towns of Black Diamond and Turner Valley. Less than 3% of households currently subscribe to the service.

3.2 Regional Waste Diversion Program

As previously identified, there is only one municipality in the region which is currently offering curbside recycling. The Town of Okotoks' program switched from a subscription based program to a mandatory program for all single family households in October 2016. Recyclable/divertible materials that are not collected through a curbside program can be self-hauled to a local recycling drop-off/depot.

Municipalities throughout southern Alberta are moving towards single stream recycling collection in order to achieve maximum material capture through recycling programs. The City of Calgary as the largest municipality in the region currently offers automated curbside single stream recycling collection for all single family households and requires all multi-family buildings to offer comparable recycling for residents. Along with the Town of Okotoks' move toward single stream automated curbside collection, this level of service is becoming the norm in southern Alberta.

For the region, a regional curbside recycling program would involve a single entity coordinating and undertaking collection services, providing public education and outreach, collecting utility fees and delivering collected materials to a processing facility. Managing the program as a regional system takes advantage of economies of scale and maximizes use of the collection vehicles and distribution of capital costs. Important considerations in the regional curbside collection analysis is servicing all the households in the region. Collection can be conducted 5 days per week, and operation and maintenance of vehicles would be undertaken collectively.

3.3 Service Level Gap Analysis

Table 10 below summarizes the municipally provided programs for recyclable materials. In most municipalities in the region, IC&I and C&D waste collection services is provided by private contractors which makes it difficult for municipalities to implement new diversion programs. Curbside recycling is provided to residents in only one municipality although the service is available on a private subscription basis in 50% of municipalities.

Table 10: Opportunities for Enhanced Waste Diversion by Municipality – Recycling

Municipality	Available Recycling Drop-off/Depot [Y/N]	Subscription Based Curbside Recycling [Y/N]	Mandatory Curbside Recycling [Y/N]	Mandatory Organics Management [Y/N]	IC&I and MF Recycling [Y/N]	C&D Recycling [Y/N]
MD of Foothills	Y	Y	N	N	N	N
Town of Okotoks	Y	N	Y	Y	N	N
Town of High River	Y	Y	N	N	N	N
Town of Black Diamond	Y	Y	N	N	N	N
Town of Turner Valley	Y	Y	N	N	N	N
Town of Nanton	Y	Y	N	N	N	N

3.4 Considerations to Address GAPs

Based on a common goal of 80% diversion of waste from the landfill by 2020 significant stepwise change must occur. The following sections outline potential tactics to increase waste diversion in the region categorized based on Tetra Tech's Waste Management Planning Framework (Figure 7).

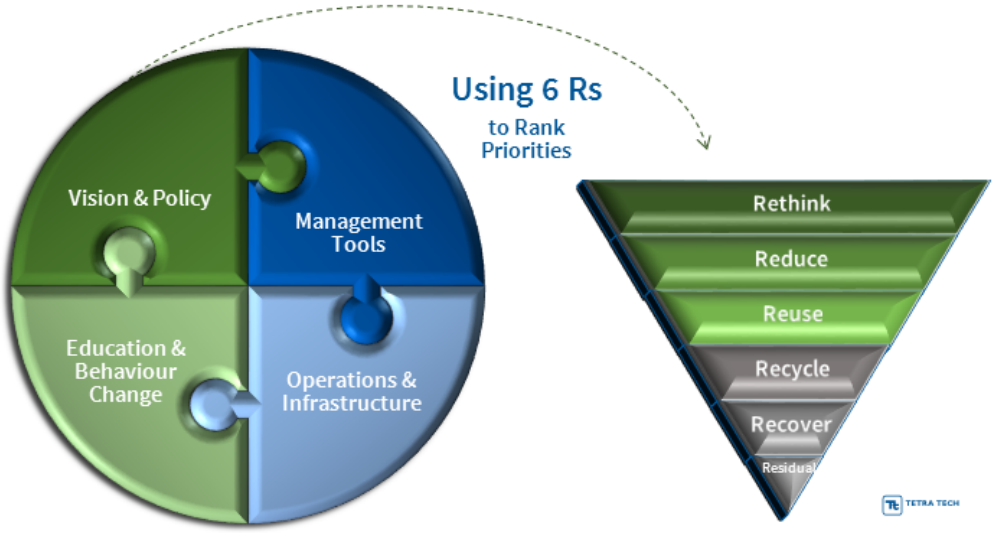


Figure 7: Tetra Tech Waste Management Planning Framework

3.4.1 Vision and Policy

Alberta's solid waste strategy document, "Too Good to Waste", recommends that municipalities should adopt stringent waste reduction targets and feedback mechanisms over a specific timeframe. In the waste strategy document, two targets were identified. The first target is an 80% diversion (and energy recovery) goal by 2020. The second is a 500 kilogram (kg)/capita/year disposal target based on waste generated across all sectors.

The Town of Okotoks' target of "80% waste diversion by 2020" provides a good basis for policies and direction for solid waste management and waste diversion. Ambitious waste diversion targets are becoming the norm for municipalities in Alberta. In 2015, the City of Calgary set revised its targets from "80% waste diversion by 2020" to 70% waste diversion from single family homes, 65% waste diversion from multi-family homes, 75% waste diversion from the IC&I sector, and 40% waste diversion from C&D activities by 2025. The Alberta Urban Municipalities Association (AUMA) comprising member municipalities across the province has adopted a zero waste target within their solid waste management strategy.

In order to maximize waste reduction in the region, all municipalities will require waste reduction targets set against baseline data. Targets should be adjusted regularly as waste composition by sector shifts and new programs are adopted. As specific programs are implemented, interim targets can be developed to focus on recyclable and compostable materials in the existing waste stream by sector. Greenhouse gas savings can also be quantified based on the lower carbon footprint for processing recyclables and compostables rather than disposing of those items as garbage. Updated population projections can also be used to map out per capita targets to align with future regional goals and move towards meeting the Provincial target of 500 kg/capita/year.

For the process to be meaningful, the municipalities need to establish a formal working arrangement complete with the establishment of a clear vision and guiding principles; setting of realistic goals, objectives and targets; and a commitment to providing the appropriate level of political, operational and financial resources. Once these are established, interim goals can be crafted and the policies, programs and infrastructure can be selected to achieve the interim and long-term targets. While the Town of Okotoks has an 80% diversion target by the year 2020, this is a goal that requires further discussion among FRSC members.

While there are many approaches available to the region, there are certain elements that are outside the commission's control. For example, provincial and/or federal regulations related to product stewardship. While these need to be taken into consideration when embarking on a harmonized inter-municipal waste management plan, decisions related to vision and policy need to be based on current facts and realities (i.e., financial, human, operational). That said, flexibility and adaptability must be a part of the planning framework so as to adjust and 'course correct' over time.

3.4.2 Management Tools

For the purposes of this section, it has been assumed that the region is ready, willing and prepared to enter into an inter-municipal cooperative agreement for the purposes of delivering solid waste management services and that all parties are committed to the 80% diversion goal by the year 2020. While the exact nature of the Governance Structure and the service level delivery model is yet to be determined – and additional information on this subject is included in Section 6.0 – this section outlines, at a high level, the various management tools that could and should be implemented so as to put the region on a solid foundation towards achieving the stated objective.

Management tools come in a variety of forms (political, administrative, financial and operational) and each serves a specific function to support the achievement of the diversion goal, meaning that when working together, the implementation of these tools form a strong bond and that if deficient in one aspect, the chain weakens.

Typically, different management strategies are used to motivate participation in waste diversion programs in different generating sectors and the tools used for the single family residential sector often differ from the tools used for the commercial or IC&I sectors as each has different motivations and drivers. As such, and to achieve the 80% diversion goal, separate yet concurrently implemented approaches should be developed and deployed.

Residential Sector

Within the residential sector, the main drivers for effective participation tend to include the frequency of collection, the capacity of the receptacles used, the costs (utility rates), information and education and enforcement. Assuming that the members of the FRSC agree to work towards a common waste diversion goal, local (or regional) bylaws should be developed and enacted clearly outlining the rules and regulations for a harmonized waste management system.

Currently, industry best practices for collection involves weekly collection of recyclables and organics (year around) and bi-weekly (every-other-week) collection of garbage. This, when supplemented with the provision of appropriately sized containers (i.e., carts) and supporting programs (such as overflow bag-tags, pay-as-you-throw, landfill bans), is referred to as a non-monetary incentive to participation and ultimately greater diversion. The provision of a universal curbside collection program, complete with aligned rules and regulations, across the region would serve to increase the current diversion rate.

Of course, in order to implement a universal collection program across the FRSC, there needs to be political will and appropriate financial resources allocated. While local politics are outside of the scope for this project and not discussed further, to roll-out a harmonized program several procurement documents would need to be developed; these would include:

1. The supply and delivery of auto-carts (for recyclables, organics and garbage);
2. The collection of the material streams; and
3. The processing of the material streams.

While the region has its landfill for the garbage stream, either a third-party agreement would be needed for the organics and recycling streams or the construction and operation of a composting facility and MRF would need to be constructed.

To support a universal waste management program, administrative processes would need to be developed, staffed and funded to ensure program participation, compliance and continual improvement. For example, within the collection and processing contracts for the various materials, quality control and contract administrative practices would need to be established, including material stream characterization studies (ideally quarterly or a minimum annually) and contractor performance evaluations (daily, monthly, annually). Of course, in order to determine the region's progress towards the 80% diversion rate target, measurement and monitoring plans need to be developed and deployed to regularly assess performance and make program adjustments if results are not meeting expectations. As well, appropriately funded promotion and education (P&E) programs would need to be established to ensure the program participants are not only aware of what is, and is not acceptable, but also as a means to keep them engaged and to inform them of their progress (i.e., status/performance updates) based on the results of the measurement and monitoring program.

With respect to program funding, the region currently offers a variety of services with a range of costs; these are expressed as either user fees or utility rates. Unlike the above mentioned management tools (which are non-monetary incentives to waste diversion), the financial health of delivering a program needs to be structured around stability. Financial incentives, be they user fees or utility rates, need to be appropriately apportioned so as

to incentivize participation in diversion programs and discourage the reliance on disposal. The future financial structure of the region's waste management system should be based either on: (1) service delivery (regardless of cost), (2) full cost recovery (based on actual and complete program costs), or (3) a combination thereof. That said, the current costs for diversion programs, namely recycling and organics, are greater than the cost for disposal.

Commercial and IC&I Sector

Often, and in many municipalities across the country, waste management policies and programs for the commercial and IC&I sector are outside of the control of the municipality; there are of course exceptions to this. However, as approximately 60% of the FRSC's waste stream is generated by these sectors, adopting policies and programs for these sectors will make a significant contribution to achieving the waste diversion goal.

For example, establishing variable rate tipping fees at the landfill to discourage disposal and incentivize diversion has been shown to be effective. However, in order to be effective, the diversion options need to be available and the cost (tip fee) for the divertible materials must be meaningfully less than the cost for disposal. Material streams that are easily divertible (if facilities exist) include but are not limited to: packaging and printed paper, hazardous wastes, electronics, wood and scrap metal.

In regards to the waste stream composition, a large component is organics, whether it is food or yard waste. As with all material streams, the provision of a disposal location, or in this case a composting facility, would be required before the collection of any large scale/quantity of organics as would the provision of administrative and operational tools (which would be similar to that for the residential sector). While the program cost for providing an organics program to the commercial and/or IC&I sector would be higher than if the material would simply be landfilled, the long-term benefits of organics diversion are well known. As all communities that have a landfill know, the greatest asset of a landfill is its air space and conserving that air space provides significant financial advantages. Additionally, by removing organics from the disposal stream, results are lower greenhouse gas emissions and leachate generation which are also advantageous.

Just like the residential sector, important considerations for the commercial sector include:

- A comprehensive P&E program;
- Enforcement and compliance program; and
- Measurement and monitoring program.

These serve to reinforce positive behaviours – through the application of monetary and non-monetary incentives – provided that they are developed and delivered regularly and consistently.

3.5 Cost Implications

Key cost considerations for any waste diversion program include: (1) collection, (2) processing, (3) commodity sales (if any), (4) administration and public education. The business case presented below is for a regional recycling collection system.

3.5.1 Collection

Collection represents the act of collecting materials from the generator. The region would likely adopt a cart-based collection system. The procurement process could include the supply and delivery of the various carts, collection trucks (likely automated), have considerations for fuel costs, and include labour to drive the trucks and load the contents in the carts into the truck.

For budgetary purposes, the cost for a cart is between $75 and $100 each. When considering the number of households in the region, the total cost could be perceived as high. However, the cost could be amortized over the life of the carts which could range from 7 to 10 years.

Automated collection trucks cost in the order of $375,000 and typically have a service life of 7 to 8 years. As part of the business case assessment, the following sections will calculate the monthly per household costs for the collection trucks, fuel for the trucks and labour to operate the trucks.

3.5.2 Processing

The CH2M report, dated November 2014, examines six scenarios for a centralized processing facility for Okotoks. The CH2M Hill report identified that the region could generate approximately 2,900 tonnes of recyclables in 2016 and increase to 4,700 tonnes by the year 2031. The report presented high level processing costs (i.e., dollars per tonne) for the various scenarios. The subsequent sections below will summarize the design and cost considerations for establishing a material processing facility at the regional landfill.

3.5.3 Commodity Markets

Commodity prices fluctuate over the course of the year. Currently, the Town of Okotoks receives approximately $60 to $80 per tonne for the recycles that are collected from the depots. The revenue for the commodities will offset the total cost for the curbside recycling program.

3.5.4 Administration and Public Education

In addition to the costs listed above, the region must also consider the cost of administrating the program. This would involve all aspects of contract administration and operational review/assessments and reporting as well and P&E. At least one full time employee would be required to administer the program at a full burdened rate of approximately $130,000 per year. Currently, best practices suggest that for P&E, $1 per household be spent for existing programs and that as much as $3 per household be spent when program changes are being contemplated. As such, and assuming $3 per household to launch a region-wide P&E program, a budget amount of approximately $75,000 be allocated.

Furthermore, when launching a new program, baseline material stream composition should be determined so that future successes (or deficiencies) can be accurately measured. Ideally, a composition study is conducted four times per year (i.e., each season) on each material stream both before, and after a program's launch. At minimum, a budget of $100,000 annually should be provided for this work.

Personnel are typically required to coordinate the various activities in a curbside collection program. This may involve financing for the assets, collection of funds, retaining staff to undertake collection efforts, marketing of commodities, coordination of collection routes and schedules, managing customer complaints and inquiries, and managing operating costs. Administration costs can range between 10% and 20% of a solid waste management program. Since garbage collection, depot operation and landfill operation already exists, the incremental cost for administration of a curbside recycling program should be in the lower range of the entire cost.

4.0 MATERIAL RECOVERY FACILITY

The proposed MRF has been designed to service the region's needs for the next 20 years. The following subsections below discusses the design criteria (and related assumptions), process flow capacity (based on projected flow rates), conceptual layout and cost estimate.

4.1 Design Criteria

The proposed MRF is for recyclable materials that are collected through a single stream or commingled approach. Recyclable materials would be placed into one bin and that bin would be collected weekly at the curbside from single family households or operations that could have their waste and recyclables collected in this manner.

In developing the design criteria for any successful MRF, each component affecting operational and capacity costs as well as operational and logistical efficiencies must be considered. The sections below outline the criteria used in the MRF design.

4.1.1 Site Location

The proposed location of the MRF is the Commission's Regional WMF. Key considerations for locating the MRF at the WMF include:

- Traffic flow for collection vehicles and facility operations;
- Existing scales at the WMF will be used to weigh the materials processed and the commodities taken to market;
- Storage requirements (two weeks) for unprocessed commingled feedstock, sorted and baled commodities and non-revenue residuals; and
- Approximately 1.2 hectares of existing WMF land would be needed for the MRF facility.

4.1.2 Building Structure Requirements

The MRF will be housed in a metal freestanding structure. Minimum building requirements include the following:

- Minimum clearance for internal space of 8.5 m (28 ft.) which will allow for storage maximization of market ready products.
- Effective loading dock:
  - Loading dock laid out to support industry standard equipment (53 ft. tractor trailers and 40 ft^3 high top containers); and
  - Turning radius of large commercial vehicles must be considered in selection of the loading dock location.
- Bay doors should be a minimum height of 7.3 m (24 ft.) if materials are delivered to the facility by commercial waste industry vehicles.

4.1.3 Equipment Requirements

The choice of equipment within a MRF is highly dependent on the composition of materials entering the facility and the end market specifications of the materials to be produced. Due to the lack of waste characterization information, the composition of the recyclable materials is assumed to be comparable to materials collected from the City of

Calgary. Equipment selection will depend on the materials accepted in the recycling stream(s), and level(s) of contamination. Key considerations in equipment selection will include:

- Safety and operational efficiency in material movement; and
- Flexibility to allow for technological developments (i.e., future equipment retrofits) and changes required to add additional material types as markets become available.

The typical operating fixed equipment required for a facility that can handle the projected volumes would be the following:

1. Sort line- (manual).
2. Baler [To maximize the value of materials shipped to market, it is important that the baler be able to produce industry stands bales. The minimum requirement is 1,000 lb (450 kg) bales.]
3. Loading dock.
4. Bale storage area.

Other basic mobile equipment would include:

- Forklift(s);
- Front-end loaders;
- Pallet jacks; and
- Portable scales.

4.2 20 Year Process Flow Rate

The estimated process flow rate for the proposed MRF is based on population projection for the respective communities for the next 20 years. Due to the lack of waste characterization information, it was assumed that the characteristics and amount of recyclable materials collected would be similar to the City of Calgary. Appendix C provides details of the 20 year process flow rate calculations.

Based on growth strategy projections provide by each town or estimated growth rates, Tetra Tech was able to forecast the population in the region. The region is estimated to grow to a population of 100,000 by 2036.

Based on the average household density of 2.76 in the region, the number of households in the region should grow to approximately 36,200 by 2036. If the City of Calgary's annual recycling recovery rate (approximately 200 kg per household) is used to estimate how much recyclable material could be collected, this equate to 7,250 tonnes per year.

The process flow rate was also calculated to take into consideration peak monthly flows. In the region, that was the month of May and quantities were up to 12% of the annual rate. That equates to a peak flows of 870 tonnes per month or 218 tonnes per week. The hourly process rate for the MRF process design is calculated to be 5.5 tonnes per hour.

4.3 Conceptual Design

A conceptual design for a MRF constructed at the Foothills Regional WMF was prepared by RRT Design and Construction (RRT). The MRF design calculations and report are summarized below and included in Appendix D and Appendix E.

The operational and design requirements were provided by Tetra Tech to RRT. The design is has been developed to provide processing for the projected 20 year peak material flow of 7,250 tonnes per year assuming single shift operation 250 days per year. The design assumes that a second shift would be added to the facility if mandatory recycling was provided to all IC&I sector organizations.

Initial conceptual designs have been made assuming recycling material stream composition equivalent to other Alberta municipalities including over 47% Old Newsprint (ONP)/Mixed Paper, almost 22% Old Corrugated Cardboard (OCC), almost 11% glass and over 13% residual waste. Recycling stream composition may be slightly different in the region but the impact on conceptual design is expected to be minimal.

The conceptual design envisions a multi-step process:

- Step 1: A front-end loader visually inspects material received and removes large, non-hazardous contaminants.
- Step 2: Manual pre-sorting will remove scrap metal, OCC, and large reject materials including film bags.
- Step 3: The material stream will be screened to remove fines including broken glass, dirt, caps, lids, small shredded fibre, etc.
- Step 4: A Fibre/Container Separation Screen (or Ballistic Separator) will separate fibre from containers.
- Step 5: An elevated Fibre Sorting Line will complete separation of fibre materials and an elevated Container Sorting Line will complete separation of containers.
  - Fibre Sorting Line to include manual sorting for OCC, trash, film, non-recyclable material, and containers. ONP and Mixed Paper will be negatively sorted and will discharge from the end of the sort line.
  - Container Sorting Line to include magnetic separation of ferrous metals, and manual sorting of fibres, plastics and non-ferrous metals. Non-recyclable material will be negatively sorted and discharge off the end of the sort line.

The design incorporates both automated and manual sorting to maximize efficiency while meeting the quality requirements of end markets. RRT has provided a preliminary equipment list including processing equipment, rolling stock, and other MRF components including conveyor belts, elevated platforms, screens, ballistic separator, ferrous magnet, steel-wall bunkers, and a systems controls package. The design assumes the use of the Town of Okotoks' recently commissioned Baler and Infeed Conveyor. Rolling stock requirements include a front-end loader, forklift, movable bale loadout ramp, and several hoppers and roll off containers

The required building size is estimated at 12,000 ft^2 to 14,000 ft^2 with an attached 1,000 ft^2 attached shed.

Materials recovered through the MRF design are summarized in Table 11 below.

Table 11: Materials Sorted through Conceptual MRF Design

Material Type	Processed/Recovered
ONP/ Mixed Paper	Recovered, Baled, Sold to Market
OCC	Recovered, Baled, Sold to Market
Steel Cans	Recovered, Baled, Sold to Market
Scrap Metal	Recovered, Loose in Rolloff Bins, Sold to Market
Aluminum Cans	Recovered, Baled, Sold to Market
High Density Poly-Ethylene (HDPE) – without-deposit	Recovered, Baled, Sold to Market
High Density Poly-Ethylene (HDPE) – Beverage container with deposit	Recovered, Baled, Sold to Market
Poly-ethylene Terephthalate (PET)	Recovered, Baled, Sold to Market
Mixed Plastics (3-7)	Recovered, Baled, Sold to Market
Rigid Plastics	Recovered, Baled, Sold to Market
Wood	Recovered, Loose in Roll-off Bins, Sold to Market
Glass / Fines	Recovered, Loose in Roll-off Bins, Landfilled or Shipped Off-Site for Further Processing
Film	Not Recovered, Included with Residue and Landfilled
Residue	Stored in Roll-off Containers, Landfilled

4.4 Estimated Cost

Based on the preliminary conceptual design prepared by RRT, the equipment cost for a MRF is in the $2 million range. Tetra Tech has estimated the cost to build a 1,100 m^2 (12,000 ft^2) to 1,300 m^2 (14,000 ft^2) with an attached 90 m^2 (1,000 ft^2) attached shed at $1,050,000. It should be noted that this cost does not include the addition of an office, washrooms, or other facilities. This cost assumes the existing WMF facilities would be shared.

Costs presented in this section do not include the costs of implementing a single stream curbside recycling collection program throughout the region. Furthermore, an important consideration for the cost of the MRF is its location within the Foothills Regional WMF. The costs estimated include engineering design, and construction/commissioning costs for a facility not built on any previously landfilled material.

5.0 FINANCIAL ANALYSIS

The capital and annual operating costs are presented in the tables below. Costs are also presented on a per tonne basis for materials processed.

This analysis takes into consideration that land to build the MRF on will have no added cost and that zoning will not require additional resources since the WMF is already permitted for solid waste management activities.

Table 12: Capital Costs

Items	Material Recovery Facility
General Site Grading and Preparation	$100,000
MRF Building	$900,000
MRF Processing Equipment (w/o baler)	$2,000,000
Storage Building	$50,000
Equipment (Mobile – Loaders and Fork Lifts)	$150,000
Three Phase Power	$100,000
Subtotal Capital	**$3,300,000**
Engineering (10% of non-mobile equipment capital)	$315,000
Contingency (25% of non-mobile equipment capital)	$787,500
Total Capital	**$4,402,500**

Table 13: Annual Operating Costs

Item	MRF
Labour	$670,000
Utilities	$ 80,000
Equipment Maintenance and Use	$100,000
Bi-Product Revenue (avg. $60/t)	-$432,000
Subtotal	**$418,000**
Contingency (20%)	$84,000
Total Operating	**$502,000**

Table 14: Annualized and Cost per Tonne

Item	MRF
Annualized Capital (20 years at 6%)	$383,830
Annual Operating	$502,000
Annualized Total	$885,830
Cost per Tonne	**$123**

Item	Cost	Comments
Capital cost (w/o baler)	~$4.4M CDN	Includes contingencies
Operating cost	~$500,000	Includes revenue from commodity sales
Annualized Cost	~$900,000	Amortization at 20 years (6%)
Monthly cost per household	$4.39	Assume 16,800 households
Unit processing cost	$123 per tonne	At 2036 recovery levels
	$190 per tonne	At 2015 recovery levels

At the calculated annual cost and for all of the households in the region which are currently receiving curbside collection services (16,800), the monthly cost per household is $4.39.

6.0 BUSINESS CASE AND STRATEGY DEVELOPMENT

6.1 Status Quo Service Level (Curbside Collection)

As previously described, the status quo service level for the Town of Okotoks includes garbage, recycling and organics curbside collection. Among the remaining communities, curbside collection is only offered for garbage, but there is an optional subscription based service for the collection of recyclables within the communities of Black Diamond and Turner Valley.

Table 15: Status Quo Curbside Collection Service Level – Summary

Community	Regional Collection System		
	Garbage	Recycling	Organics
MD of Foothills	2% of households	No	No
Town of Okotoks	Yes	Yes	Yes
Town of High River	Yes	No	No
Town of Black Diamond	Yes	Subscription Based	No
Town of Turner Valley	Yes	Subscription Based	No
Town of Nanton	Yes	No	No

6.2 Regional System Analysis

A regional collection system business case was developed that includes the amalgamation of resources among the communities to provide regional services for curbside collection of residential waste and recycling. The proposed regional system cost per household was tabulated below and compared to status quo costs for each community.

A financial model was used to estimate the collection costs for a regional collection system (residential waste and recycling). A summary of the costs is tabulated in Appendix E. The primary financial elements in the model include the following:

- Capital costs – collection trucks and carts.
- Operating costs – labour, fuel, program administration.

The capital and operating costs for a regional curbside recycling and residential garbage collection system are broken down in Section 6.2.1 and Section 6.2.2 below.

6.2.1 Regional Curbside Recycling Collection

6.2.1.1 Capital Costs – Curbside Recycling Collection

The capital costs include the collection trucks and the carts, with the greatest capital cost being the acquisition of collection trucks for the regional curbside collection program. The cost of an automated collection truck is estimated at $375,000. It is assumed that the total number of households serviced in the region will be 16,800. Based on this information, and assuming collection is completed five days per week (with one recycling collection day per week per household), a total of five collection trucks will be needed to support the collection of recyclables. The total capital cost for the five additional collection trucks is $1.875 million. Assuming each truck has a life of approximately 7 years and amortizing the cost over the span of these 7 years (with a 6% interest rate), this equates to a total of $1.62 per household per month. It should be noted that the acquisition of backup trucks has not been included since it is assumed existing older trucks may be used for this purpose.

As for the carts, the cost of an individual recycling cart will range from $75 to $100 per cart. To support the region, this represents a capital cost of roughly $1.68 million (assuming the highest value in the range). With the life of a cart assumed to be roughly 10 years and amortizing the cost over the life of the cart (with a 6% interest rate), this equates to approximately $1 per household per month.

Table 16: Curbside Recycling Collection Costs – Summary of Capital Costs

Item	Value
Recycling Collection Trucks	
Number of Automated Recycling Trucks	5
Cost per Automated Recycling Truck	$375,000
Total Recycling Fleet Capital Cost	$1.875 million
Annual Total Recycling Fleet Capital Cost (7 year loan at 6% interest rate)	$335,878
Cost per Household per Month	**$1.67**
Recycling Carts	
Number of Recycling Carts	16,800
Cost per Recycling Cart	$100
Total Recycling Cart Cost	$1.68 million
Annual Total Recycling Cart Cost (10 year loan at 6% interest rate)	$228,258
Cost per Household per Month	**$1.13**
Curbside Recycling Collection – Total Capital Costs per Month	**$2.80**

6.2.1.2 Operational Costs – Curbside Recycling Collection

The operating costs have been broken down into labour, truck maintenance/fuel costs and program administration costs. It has been assumed that labour will include one employee per truck, which represents five additional employees. With an estimated annual salary of $90,000, the total recycling truck fleet labour costs are $432,000 per year.

Truck maintenance costs have been estimated at $12,000 per year for each recycling truck, which equates to an annual cost of $57,600. Fuel costs have been estimated at $240 per day, assuming 5 collection days per week annually, this is equivalent to approximately $299,520 per year. An additional 20% of the total maintenance/fuel costs has been included to account for maintenance and fuel costs for the backup trucks which may be used throughout the year.

Program administration costs for the implementation of the regional recycling collection program have been estimated as $130,000. An additional $100,000 per year has been included to account for waste composition studies.

Table 17: Curbside Recycling Collection Costs – Summary of Operating Costs

Item	Value
Truck Fleet Labour Costs	
Number of Drivers	5
Annual Salary	$90,000
Annual Total Recycling Fleet Labour Cost	$450,000
Cost per Household per Month	**$2.23**
Recycling Truck Maintenance/Fuel Costs	
Annual Recycling Truck Maintenance Costs per Truck	$12,000
Annual Total Recycling Truck Maintenance Costs	$60,000
Daily Fuel Costs per Truck	$240
Annual Total Fuel Costs (assuming 5 collection days)	$312,000
Additional Maintenance/Fuel Costs for Backup Trucks	$74,400
Annual Total Recycling Truck Maintenance/Fuel Costs	$446,400
Cost per Household per Month	**$2.21**
Program Implementation Costs	
Annual Total Administration Costs	$130,000
Annual Waste Composition Studies	$100,000
Cost per Household per Month	**$1.14**
Curbside Recycling Collection – Total Operating Costs per Month	**$5.59**

6.2.2 Regional Curbside Garbage Collection

6.2.2.1 Capital Costs – Curbside Garbage Collection

In terms of the curbside garbage collection program, the capital costs only include the acquisition of carts for the region. Although it is understood that curbside garbage collection is currently being completed for all communities involved, carts have been included to ensure the bins are standardized throughout the region to simplify collection. Assuming the same costs as previously described in Section 6.2.1.1, the bins amount to approximately $1 per household per month.

For costing purposes, it is assumed the region currently owns an adequate number of trucks to continue the curbside collection of garbage, therefore trucks have not been included in the cost estimate. Based on the current waste estimates provided to Tetra Tech and the number of households, and assuming collection is completed 5 days per week (with one garbage collection day per week per household), a total of four collection trucks will be needed to support the collection of garbage.

Table 18: Curbside Garbage Collection Cart Costs – Summary of Cart Costs

Item	Value
Garbage Carts	
Number of Garbage Carts	16,800
Cost per Garbage Cart	$100
Total Garbage Cart Cost	$1.68 million
Annual Total Garbage Cart Cost (10 year loan at 6% interest rate)	$228,258
Cost per Household per Month	**$1.13**
Garbage Collection Cart Cost per Household per Month	**$1.13**

6.2.2.2 Operational Costs – Curbside Garbage Collection

Similar to the implementation of the curbside recycling collection program, the operating costs for curbside garbage collection have been broken down into labour, truck maintenance/fuel costs and program administration costs. It has been assumed that labour will include one employee per truck, which represents five employees. With an estimated annual salary of $90,000 (including benefits), the total recycling truck fleet labour costs are $450,000 per year.

As with the recycling truck maintenance costs, $12,000 per year has been estimated for maintenance for each garbage truck, which equates to an annual cost of $60,000. Fuel costs have been estimated at $240 per day, assuming 5 collection days per week annually, this is equivalent to approximately $312,000 per year. An additional 20% of the total maintenance/fuel costs has been included to account for maintenance and fuel costs for the backup trucks which may be used throughout the year.

Program administration costs for the regional garbage collection program have been estimated as $100,000.

The implementation of a curbside recycling collection program is understood to decrease the garbage collected per household by approximately 0.2 tonnes/yr. This decrease in tonnage will provide opportunities for lower curbside garbage collection costs for households, but will also translate into a decrease in tipping fee revenue generated by the landfill.

Table 19: Curbside Garbage Collection Costs – Summary of Operating Costs

Item	Value
Truck Fleet Labour Costs	
Number of Drivers	5
Annual Salary	$90,000
Annual Total Recycling Fleet Labour Cost	$450,000
Cost per Household per Month	**$2.23**
Garbage Truck Maintenance/Fuel Costs	
Annual Garbage Truck Maintenance Costs per Truck	$12,000
Annual Total Garbage Truck Maintenance Costs	$60,000
Daily Fuel Costs per Truck	$240
Annual Total Fuel Costs (assuming 5 collection days)	$312,000
Additional Maintenance/Fuel Costs for Backup Trucks	$74,400
Annual Total Garbage Truck Maintenance/Fuel Costs	$446,400
Cost per Household per Month	**$2.21**
Program Implementation Costs	
Annual Total Administration Costs	$100,000
Cost per Household per Month	**$0.50**
Curbside Garbage Collection – Total Operating Costs per Month	**$4.94**

6.2.3 Summary

The recommended level of service includes the addition of a recycling collection service for all residents in the region who currently have garbage collection service. The business case illustrates that costs are highly dependent on the number of households that can be serviced from each vehicle. Maximizing the number of households per collection vehicle increases the distribution of cost annual costs and leads to greater costs savings.

Table 20: Regional Collection System – Summary

Items	Regional Collection System
Level of Service	Weekly Recycling and Garbage Collection
Recycling Collection Cost per Household ($/month)	$8.39
Garbage Collection Cost per Household ($/month)	$6.07
Total Collection Cost per Household ($/month)	**$14.46**
Estimated Diversion Performance (%)	12%
Diversion Per Household (tonnes/ household/yr)	0.2

Based on the values presented herein, the total monthly cost per household (assuming 16,800 households) for the implementation of a regional recycling and garbage collection service ($14.46), and processing costs for building and operating a regional MRF ($4.39) is approximately $19.

The challenges and issues which should be considered by implementing a regional collection system are presented in Table 21 below.

Table 21: Consideration to Implementing a Regional Collection System

Item	Consideration
Public Education	Each community will need to communicate the service level changes to its residents in due time. A program implementation plan template may be developed ad used for each community, however, it will likely require a certain level of customization to reflect the individual needs of each community.
Utility Administration	Each community could continue to collect fees from residents for the level of service provided, or establish a new regional payment system.
Bylaw Changes	Bylaws will need to be updated to reflect the new service levels, list target materials, funding mechanism and rate, enforcement action, responsibility for assets and operations, and goals (if desired).
Ownership of Assets	Assets can be owned by the public sector or the private sector.
Governance	The governance structure for the new system would need to be presented, discussed and agreed upon.

6.3 Regional Benefits

There are several advantages and disadvantages to having a regional MRF. Table 22 summarizes the advantages and disadvantages of owning and operating a regional MRF.

Table 22: Summary of Advantages and Disadvantages for Establishing a Regional MRF

Advantages	Disadvantages
▪ Resiliency to solid waste management system. ▪ Transparency in processing and marketing of commodities. ▪ Flexibility to change system as markets change or as required. ▪ Lower transportation cost to bring collected materials (from depot or trucks) to a MRF. ▪ Not reliant on other facilities or communities. ▪ Creation of local jobs. ▪ Control over costs.	▪ Premium cost to own and operate system. ▪ Economies of scale – a small facility (such as for the region) has a higher unit operating cost. ▪ Management of operational and global market issues. ▪ Increased complexity of waste management system.

6.4 Governance Structure Review

A regional solid waste management system governance review was undertaken by Stack'd Consulting to analyze and recommend a future service delivery model for a regional waste management system, and develop a recommended governance structure. The complete report is included in Appendix G.

The first step involved developing an understanding of the applicable objectives, governance priorities, and issues which require consideration for the proposed Regional Waste Management Collections/MRF Program. This enabled the team to identify not only holistic, regional objectives and desired outcomes, but also the individual preferences and capacity for each member.

6.4.1 Stakeholder Input

Staff from the member municipalities and commission were interviewed to gain an understanding of their priorities and perspective for a regional MRF facility. The following key themes were identified.

1. Interest in waste diversion services.
2. Priority to achieve cost efficiencies and value for money.
3. Willingness to cooperation from a regional perspective.
4. Positive view of the FRSC.
5. Preference for a single regional waste management entity.
6. Sufficient technical and management expertise required.

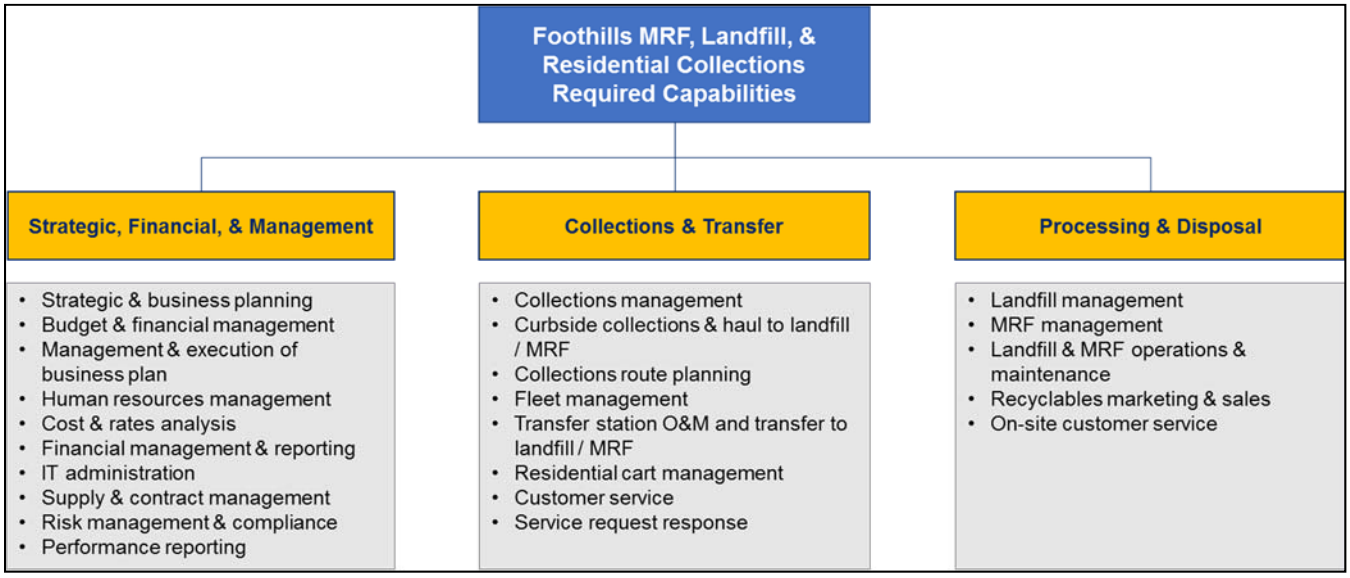
6.4.2 Service Delivery Models

Three service delivery models were identified and assessed. These include: (1) Regional MRF; (2) Regional MRF and Landfill; and (3) Regional MRF, Landfill and Collection system.

Each municipality engaged expressed an interest in the third model, provided it could deliver operating efficiencies relative to each municipality providing its own residential collections for both waste and recyclables. However, the following concerns with this alternative included the following:

- The entity would need to be accountable for the delivery of customer service levels commensurate with each municipality's expectations (including responding to customer complaints and service requests).
- It would require more significant organizational transformation of the existing FRSC if its mandate was enhanced to assume responsibilities for the MRF and regional collection services.
- It would need to provide transparent cost reporting to ensure that there would be no cross subsidization between municipalities.

Based on the preference for the third service deliver model, the following list of "to-be" capabilities were identified:



Note: The above hierarchy of capabilities does not necessary imply organizational design. Its purpose is to identify and categorize the necessary organizational capabilities required to execute its intended mandate. A "to-be" organizational design for this potential organization can then be developed based on confirmation of these capabilities.

6.4.3 Governance Alternatives

Based on the priority characteristics of a desired governance model, four unique alternatives were identified. These alternatives are described in the sections below:

1. New Separate Entity vs the FRSC.
2. Expanded mandate for the FRSC.
3. Municipally controlled corporation.
4. Part 9 Company (Not for Profit).

The governance alternatives were evaluated based on criteria that were developed during the stakeholder interviews. Table 23 below summarizes how each plausible alternative compares to each other.

Table 23: Governance Alternative Criteria

Criteria	New Separate Entity	Enhanced FRSC Mandate	Municipal Controlled Corporation	Part 9 Company	Evaluative Comments
Efficiency	3	1	2	2	▪ Given mandate to demonstrate lowest possible costs for residential customers within the region, Commission is more stream-lined structure ▪ Commission mandate to specifically focus on pursuit of operational efficiencies and demonstration of value-for-money ▪ If focus shifts to providing more services to ICI or out-of-region customers, then Controlled Corporation becomes more advantageous
Accountable for Service Delivery	3	1	2	2	▪ Municipal Controlled Corporation and Part 9 Company are further arms-at-length structures from municipal shareholders ▪ Elected officials able to bring their local perspectives and priorities to ensure alignment with municipal needs
Sufficient Management & Technical Capabilities	TBD	2	1	1	▪ Both Municipal Controlled Corporation & Part 9 Company can have industry experts on the Board ▪ Commission can hire advisor(s) to assist Board on specific matters and needs to ensure appropriate management team competencies
Regional Support	3	1	2	3	▪ Input from municipal stakeholders is that current Commission model works well for the region and is reflective of desire to collaborate and directly share in governance function

Given the evaluation summary above, it is noted that enhancing the mandate of the existing FRSC is a preferred alternative in regard to Efficiency (based on intended mandate), Accountability for Service Delivery, and Regional Support. Both the Municipal Controlled Corporation and Part 9 Company are superior to ensuring that sufficient management and technical capabilities are developed to guide the organization and serve its municipal shareholders.

However, it is possible for the Regional Commission to acquire industry/technical expertise to help guide its future operations. Given its increased scope of responsibilities, it would be prudent to transform the entity's management team to ensure sufficient strategic, financial, and operational management capabilities. These would be required to ensure it remains accountable to the demands of the region and its evolving waste management needs and opportunities. In addition, it is possible for the Board to hire an industry/technical advisor(s) to advise on specific operational, technical, and/or other organizational management considerations.

6.5 Future Research and Processing Opportunities

The MRF described in subsequent sections includes sorting and recovery of the various materials typically collected in a curbside recyclables collection program as described in Section 3.1.1.1. However, there are opportunities for other materials to be added as new processing technologies make processing more efficient downstream or as new policies are enacted upstream to enhance material collection. Processing of additional materials or material streams may offer opportunities to more efficiently use infrastructure. A facility designed with the flexibility to incorporate new materials will require ongoing research and development of processing capacity and relationships. The region should seek to identify beneficial uses to the materials currently collected at the landfill and then look to divert additional materials from the landfill. A summary of potential material uses and additions has been included below.

Recycled glass does not typically have market value to be sold to remanufacturing markets. To avoid this material ending up in the landfill some municipalities have used recycled glass as aggregate in road construction or as a filter/drainage medium[1]. Several research and pilot projects have been conducted to determine beneficial uses for crushed recycled glass. The Region should continue to investigate uses for recycled glass both within the landfill and in municipal infrastructure projects.

Materials which are currently accepted and stockpiled at the Foothills Regional Landfill but are not managed through product stewardship or enhanced producer responsibility organizations include:

- Wood;
- Clean Wood;
- Clean Drywall;
- Concrete Rubble;
- Clean Concrete;
- Asphalt; and
- Clean Shingles.

Additionally, the Town of Okotoks has recently begun a curbside collection program for compostable organics which is processed at an external facility but could be processed locally by sharing some equipment with a MRF and installing some additional infrastructure. Clean drywall could be added to compost for processing as could some lower quality cardboard or boxboard from the MRF. These materials should be shredded or ground in order to be incorporated into compost.

Several types of C&D waste are currently accepted at the Landfill. With additional separation through a C&D MRF these materials could be further separated for beneficial uses. Both asphalt and clean asphalt shingles can be recycled into new pavement. Ground or chipped asphalt materials are added to hot mix asphalt plants decreasing the need for virgin materials. Clean concrete and concrete rubble is typically crushed to be used as aggregate material including in new concrete mixes, as sub-base for roads, or as riprap to prevent erosion. The preferably use for wood waste is to reuse materials or as inputs as a feedstock for engineered woods. However, the markets for these materials can only cover a small portion of the wood waste generated in the region. The most common uses for wood waste are for biomass fuel, mulch, and compost.

[1] National Environmental Services Center. Alternatives to Gravel Drainfields. (2005). Online http://www.nesc.wvu.edu/pdf/WW/publications/pipline/PL_SP05.pdf [Accessed November 13, 2016].

7.0 FUNDING OPPORTUNITIES

The following table outlines some of the funding opportunities available to the Town of Okotoks to implement capital projects such as a MRF. The Green Municipal Fund is an example of a fund that offers a low interest loan in combination with a grant for 15% of the loan value, which can cover up to a maximum of 80% of eligible costs, for capital projects.

Table 24: Funding Opportunities

Source	Funding Name	Application Deadline	Funding Value	Eligibility	Website	Availability
FCM	Green Municipal Fund (GMF)	N/A	Combination of low interest loans and grants for capital projects up to 80% of eligible costs (to a maximum loan of 5 million and with a grant of 15 per cent of the loan amount, to a maximum of $750,000). * Applicants with high-ranking projects may be eligible for a loan of up to $10 million combined with a grant for 15 per cent of the loan amount, to a maximum of $1.5 million.	GMF funding is available to all municipal governments and their partners in eligible projects. For most municipalities, projects must demonstrate the potential to divert at least 60 per cent of municipal solid waste from landfill to be eligible for funding. If your municipality has already achieved a total diversion rate of at least 60 per cent, your project must demonstrate the potential to result in an incremental improvement above 60 per cent. Institutional and commercial waste may be included if your municipality is responsible for managing this waste.	http://www.fcm.ca/home/programs/green-municipal-fund/about-gmf.htm	Applications being accepted
PPP Canada	P3 Canada Fund	N/A	The amount of the funding support, in combination with any other direct federal assistance, may not exceed 25 percent of the project's direct construction costs.	"Eligible projects will be for the construction, renewal or material enhancement of public infrastructure within several sectors including […] Solid Waste […]"	http://www.p3canada.ca/en/	Not currently accepting applications. Round Seven is closed
Federal and Alberta Governments	Gas Tax Fund (GTF)	N/A	> $50,000	All municipalities in Alberta (i.e., city, town, village, summer village, specialized municipality, municipal district, improvement district, special area), Metis settlements and the Townsite of Redwood Meadows Administration Society are eligible for Gas Tax Fund (GTF) funding.	http://municipalaffairs.alberta.ca/federal-gas-tax-fund	Currently available Funding will run until 2024
Alberta Government	Municipal Sustainability Initiative (MSI)	December 31, 2016	Not specified	All municipalities in Alberta (i.e., city, town, village, summer village, specialized municipality, municipal district, improvement district, special area), Metis settlements and the Townsite of Redwood Meadows Administration Society are eligible. Eligible projects include solid waste management facilities/equipment.	http://www.municipalaffairs.alberta.ca/msi	Currently available
Alberta Government	Community and Regional Economic Support (CARES) program	Intake Periods: ▪ October 1, 2016 to November 30, 2016 ▪ April 1, 2017 to May 31, 2017 ▪ A third period announced in 2017	< $10,000 (Municipality must show how they will match funding)	For a project to be eligible, it must create a measurable impact and align with one or more of the following program outcomes: ▪ Improving local business environment and/or regional economic collaboration; ▪ Increasing support for entrepreneurs and small and medium-sized enterprises (SMEs) to grow and succeed; ▪ Enhancing support for businesses and industries that provide diversification to a community or a region; and ▪ Increasing investment that drives high-value job creation.	http://www.alberta.ca/community-regional-economic-support-program.aspx	Available
Alberta Innovates	Alberta Innovates Funding	N/A	N/A	Projects that align with their annual business plan.	http://www.ai-ees.ca/application-process/	Available

8.0 STAKEHOLDER CONSULTATIONS

8.1 Internal Stakeholders

Internal stakeholder meetings were held throughout the project to review project goals, obtain feedback, obtain solid waste management system details and determine whether any additional information is required to be considered.

Overall, Tetra Tech and Stack'd Consulting met with representatives from the Towns of Okotoks, High River, Black Diamond, Turner Valley, Nanton, MD of Foothills and the FRSC, including each community's Chief Administrative Officer (CAO). Two internal stakeholder meetings were held; the first to obtain information and a better understanding the existing service levels, the second to discuss the initial findings of the project.

Following consensus with internal stakeholders, the report recommendations should be forwarded to respective Councils for information and decisions for next steps.

8.2 External Consultations

Once the results of this study have been reviewed and accepted by internal stakeholders, the next step should involve consultation with elected officials at their respective council meetings. They should be informed of the findings, methodology for undertaking the study and estimated costs for the services assessed. Their feedback should dictate next steps for this project which could include consultation with external stakeholders and the public.

External stakeholders that should be consulted with include private contractors currently used by each community as part of their current collection, stakeholders involved with ICI waste and C&D waste as well as the Calgary Regional Partnership and government waste management representatives. External consultation is prudent considering that a regional collection system could affect their business practices.

Subject to endorsement by elected officials, public consultation should be undertaken to gauge the level of public support for the additional level of service. The following section discusses options for public engagement.

8.3 Public Engagement

Public engagement is an important aspect of many solid waste management planning processes. As part of the strategy development process, Tetra Tech has used the International Association of Public Participation (IAP2) consultation framework to present engagement options. As shown on Figure 8, levels of engagement can range from informing and consulting through involving, collaborating and empowering the public in the decision making process.

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives and/or solutions.	To obtain public feedback on analysis, alternatives and/or decision.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Figure 8: IAP2 Spectrum of Public Participation

(Source: IAP2 http://iap2canada.ca/page-1020549)

The options used to engage key stakeholders and general public fit into the central categories of the IAP2 framework as outlined below. Targeted stakeholder engagement and interviews are used to actively involve businesses and key stakeholders in the community to better understand concerns and aspirations and are captured and incorporated into outcomes. The options for public consultations may include the following:

- **Targeted Stakeholder Engagement** – Stakeholder focus groups may be completed that focused on presenting the curbside collection options to each community.
- **Interviews** – One-on-one interviews, both in-person and via phone, to gather feedback and opinions from stakeholders without the external influences present in workshops and focus groups.
- **Public Engagement and Surveys** – A public survey was developed to engage the community in the strategy development including determining the publics current use of waste and recycling services, and what is needed to make Squamish a zero waste community. Surveys were completed in-person at the farmers' market and grocery stores in the District, and online through the District website.
- **Open House** – All stakeholders previously invited to or involved in the process were invited to an open house on September 16 to review the draft strategy and discuss the outcomes with the project team.

It is essential that the public be engaged early enough in order to incorporate feedback into the proposed plan, however it is recommended that this step be completed only once the community representatives and council members have fully reviewed the plan proposed herein and only once any additional changes to the plan have been made by Tetra Tech. As such, it is anticipated that the public would not be engaged until early 2017.

The proposed plan to engage the public is subject to feedback and direction from elected officials. It is premature to propose a public consultation process that has not been approved by elected officials.

9.0 RECOMMENDATIONS

Amongst the municipal and commission staff members that were involved in this assessment, there is interest in pursuing a regional waste management system that is responsible for collection of waste and recyclables, processing of recyclables and disposal of waste, provided it achieves cost efficiencies and results in good value for money.

The preferred approach is for a regional waste management system that would involve a single entity coordinating and undertaking collection services, providing public education and outreach, collecting utility fees and delivering collected materials to a processing facility. From each member municipality's perspective, managing the program as a regional system takes advantage of economies of scale and maximizes use of the collection vehicles which broadens the distribution of capital costs.

Key cost considerations for the implementation of a regional recycling curbside collection program and the development of a regional MRF include collection and processing of the materials. Based on the findings presented herein, the costs to implement a regional collection system process is approximately $12.50 per month per household, recognizing that more than 50% of the cost is attributed to the activity of collecting of the recyclable materials.

The MRF has been designed for the volume of recyclables expected to be collected in the region. As such, it is considered as being a smaller scale facility which equates to a high unit processing costs. The trade-off for a regional MRF is the following:

1. Regional solution for waste management.
2. System resiliency (less effected by priorities or demands from other larger communities).
3. Local job creation.
4. Increased efficiencies for collection and depot operation.

10.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
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PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date Mar 10, 2017
PERMIT NUMBER: P13774
The Association of Professional Engineers and Geoscientists of Alberta

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APPENDIX A

TETRA TECH'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOENVIRONMENTAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.1 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of TETRA TECH’s client. TETRA TECH does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than TETRA TECH’s Client unless otherwise authorized in writing by TETRA TECH. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the report, if required, may be obtained upon request.

1.2 ALTERNATE REPORT FORMAT

Where TETRA TECH submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed TETRA TECH’s instruments of professional service); only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by TETRA TECH shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of TETRA TECH’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except TETRA TECH. The Client warrants that TETRA TECH’s instruments of professional service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

1.3 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

1.4 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of the report, TETRA TECH may rely on information provided by persons other than the Client. While TETRA TECH endeavours to verify the accuracy of such information when instructed to do so by the Client, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B

COMMUNITY PROFILES

MD OF FOOTHILLS

TETRA TECH

MD of Foothills

Description	Metric
Population	21,258
Annual MSW Disposal Rate (tonnes)	8,608
Per Capita Disposal (tonnes/year)	0.40
Diversion Rate	--
Landfill Tipping Fee ($/t)	$65/tonne
Recycling Cost	$14.42/month
Collection schedule	--
Recycling Volumes (t/yr)	--

COMMUNITY OVERVIEW

The Municipal District (MD) of Foothills is located directly south of Calgary. The reported 2015 population was 21,258 people occupying 7,643 private households (Statistic Canada 2013).

EXISTING WASTE MANAGEMENT SYSTEM

Most of the residents (approximately 20,000) do not have municipal garbage collection services. These residents will either contract with a private hauler to collect their waste or take their waste to one of the two transfer stations located in the MD. The proportion of households with private waste collection contracts is unknown.

Table A. Transfer Stations – Location and Hours of Operation

Transfer Station	Location	Hours of Operation
Black Diamond/Turner Valley	168 St. West and 402 Avenue	Friday & Saturday from 10:00 a.m. to 4:00 p.m.
Priddis	264 St West and 178 Ave	Tuesday & Saturday from 10:00 a.m. to 4:00 p.m.

Because of historical arrangements, the MD collects from 400 households living in the communities of Blackie, Cayley, and Silvertip. The MD has a contract with a private sector waste hauler (Contain-A-Way Waste Management) who provides weekly garbage collection. The MD charges these residents $28.84 bimonthly ($14.42 per month) for garbage collection services.

Transfer stations in the MD of Foothills only accept garbage in special colour coded bags. The transfer stations do not accept recyclable materials. The bags can be purchased at the Millarville General Store, Hi Ho in Turner Valley, the Esso in Black Diamond or at the transfer stations.

TOWN OF OKOTOKS

TETRA TECH

Town of Okotoks

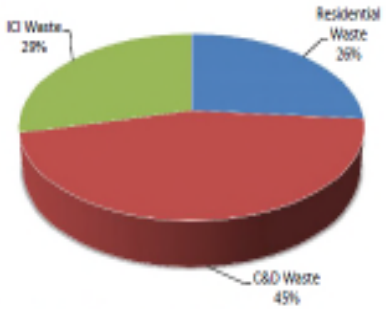
Description	Metric
Population	27,331
Annual MSW Disposal Rate (tonnes)	11,735
Per Capita Disposal (kg/year)	0.43
Diversion Rate	38% (residential sector)
Landfill Tipping Fee ($/t)	$67 MSW $110 Other Material
Recycling Cost	Monthly Utility Bill - $7.25/month
Collection schedule	Garbage – every week
Recycling Volumes (t/yr)	2,500

COMMUNITY OVERVIEW

The Town of Okotoks is situated along the Sheep River approximately 20 km south of the City of Calgary. The 2015 population was 27,331 as reported in the FRSC 2015 Annual Report (FRSC 2015). Based on Canadian census data, population increase from 2006 to 2011 was 42.9%. In 2011, the Town of Okotoks had 8,704 households (Statistic Canada, 2012).

EXISTING WASTE MANAGEMENT SYSTEM

The Town of Okotoks is committed to reducing and diverting waste and maximizing the lifespan of the Foothills Regional Landfill. Currently the Town of Okotoks is below the 80% waste diversion rate target set for 2020.



Town of Okotoks 2009 Resource Recovery Plan (CH2M Hill)

Residential sector

In 2014, 26% of the total was generated in Okotoks was residential waste. The residential sector diversion rate was 38%. The 38% diversion rate can be attributed to the current organics recycling program. Organics represents 42-56% of residential garbage.

As of October 2016, the Town provides all single-family household residents with a mandatory waste, recycling and organics collection service. Residents are provided with 120 L capacity bins for organics and waste, and 240 L capacity bins for recyclables. Residents are charged $20.50 per month for these services, which also includes the fee for operating the Town of Okotoks Eco Centre (Eco Centre).

Organic waste is collected every other week in the winter (November to April) and weekly during the rest of the year (May to October). Recyclables and waste are collected weekly throughout the year.

ICI and C&D Sectors

The Town of Okotoks does not provide garbage, recycling or organic waste collection services to the IC&I and C&D sectors.

RECYCLING PROGRAM AND INITIATIVES

The Town of Okotoks has an Eco Centre for the waste that is not collected within the residential recycling program (i.e. polystyrene, household hazardous waste (HHW), CFL bulbs, electronics, appliances, etc.). The Eco Centre also serves as a drop-off and processing site for recyclables from the portion of the town's residential sector that includes multi-family residents, the commercial, industrial and institutional sectors and surrounding communities. The Eco Center has reached the point where expansion of the existing recycling processing facilities is required. However this expansion is not possible within its current location due to limited space.

In 2015, due to increased stringency of the Provincial Transportation of Dangerous Goods Regulations, the Okotoks Eco Centre became the official collection site for HHW and electronics.

PRIORITIES

The Town of Okotoks is striving to accomplish the following initiatives for their existing recycling program:

- Evolve the Town of Okotoks" subscription based residential recycling collection program to a universal regional-wide program;
- Implement a bylaw for multi-family and the IC&I Sector facilities to provide on-site single source commingled recycling and organic waste collection services.

TOWN OF HIGH RIVER

TETRA TECH

Town of High River

Description	Metric
Population	12,920
Annual MSW Disposal Rate (tonnes)	11,291
Per Capita Disposal (tonnes/year)	0.87
Diversion Rate	--
Landfill Tipping Fee ($/t)	--
Recycling Cost	$14.42/month
Collection schedule	--
Recycling Volumes (t/yr)	--

COMMUNITY OVERVIEW

The Town of High River is located 37 km south of the City of Calgary, at the junction of Highway 2 and Highway 23. In 2015, the reported population of the Town of High River was 12,920 based on Canadian census data, the population grew by 20.6% in the five years from 2006 to 2011. In 2011, High River had 5,473 total private households (Statistic Canada, 2012).

EXISTING WASTE MANAGEMENT SYSTEM

The Town of High River operates a garbage collection service using side load automated trucks. Waste is hauled to the Foothills Regional WMF. Residents are charged for this service based on garbage cart sizes: 240L ($10.10 monthly) and 360L ($14.00 monthly). Garbage is collected weekly on Tuesday, Wednesday, Thursday, and Friday.

RECYCLING PROGRAM AND INITIATIVES

The Town of High River Recycling Depot is located in the northern portion of the town. They accept items such as: mixed paper, newsprint, tin cans, cardboard, mixed plastics, cell phones, batteries, and electronics. Recyclable materials from the recycling depot are collected by Contain-A-Way Waste Management three to four times a week and hauled to the Cascades Recovery Inc. MRF in the City of Calgary. Electronics are collected through the Alberta Recycling Management Authority (ARMA). The depot has a baler at the recycling facility for cardboard. The depot is staffed by twenty full time employees and five to seven seasonal employees.

Yard waste (including grass clippings, leaves, and branches) are accepted at yard waste drop-off station located near the recycling depot, where it is them taken to the regional WMF.

TOWN OF BLACK DIAMOND

TETRA TECH

Town of Black Diamond

Description	Metric
Population	2,373
Annual MSW Disposal Rate (tonnes)	1,228
Per Capita Disposal (tonnes/year)	0.52
Diversion Rate	--
Landfill Tipping Fee ($/t)	$65/tonne
Recycling Cost	$20.00/month
Collection schedule	Weekly
Recycling Volumes (t/yr)	--

COMMUNITY OVERVIEW

The Town of Black Diamond is located on Highway 22, approximately 3 km west of Turner Valley and 68 km southwest from the City of Calgary. In 2011, the population was 2,373 people (Statistics Canada 2012). Based on Canadian census data, the population increased by 24.9% from 2006 to 2011. In 2011, the Town of Black Diamond had 1,001 total households. Most people commute to work in the City of Calgary or other surrounding communities.

EXISTING WASTE MANAGEMENT SYSTEM

The Town of Black Diamond operates an automated garbage collection system. Two cart sizes are available to residents: 120L and 360L. The cost for residential garbage collection is $20.44 bimonthly and residents are charged on their residential utility bills. The Towns of Black Diamond and Turner Valley share a garbage collection truck. Garbage collection in the town normally takes place on Thursdays and Fridays. No waste composition studies have been conducted in the Town of Black Diamond.

RECYCLING PROGRAM AND INITIATIVES

The Towns of Turner Valley and Black Diamond share the operations cost of the Oilfields Recycling Centre. According to the Town of Turner Valley website, the Oilfields Recycling Centre services the Towns of Turner Valley and Black Diamond, the Village of Longview, and the MD of Foothills. The Oilfields Recycling Centre is located in the Town of Turner Valley which operates the centre. Black Diamond residents pay for their access to the Oilfields Recycling Centre through their utility bills. The recycling fee for this service is $9.22 bimonthly. A private contractor (T&T Disposal Services Ltd.) operates a weekly curbside recycling collection service. T&T Disposal Services Ltd. charges $20 per month to collect recycling material from the 34 subscribed households (3.4% of households).

TOWN OF TURNER VALLEY

TETRA TECH

Town of Turner Valley

Description	Metric
Population	2,167
Annual MSW Disposal Rate (tonnes)	1,098
Per Capita Disposal (tonnes/year)	0.51
Diversion Rate	--
Landfill Tipping Fee ($/t)	--
Recycling Cost	$20.00/month
Collection schedule	Weekly
Recycling Volumes (t/yr)	--

COMMUNITY OVERVIEW

The Town of Turner Valley is located 3 km west of Black Diamond and approximately 60 km southwest of the City of Calgary. In 2011, the population was 2,167 (Statistics Canada 2012). Based on Canadian census data, the population increased by 13.6% from the 2006 to 2011. In 2011, the Town of Turner Valley had 934 total households (Statistic Canada, 2012).

EXISTING WASTE MANAGEMENT SYSTEM

The Town of Turner Valley provides automated curbside garbage collection to residents. Garbage is collected weekly on Tuesdays or Wednesdays. The cost of residential garbage collection is $21 bimonthly ($10.50 monthly). This fee covers the collection fee and the tipping fee from the landfill.

RECYCLING PROGRAM AND INITIATIVES

The Towns of Turner Valley and Black Diamond share the cost of operating the Oilfields Recycling Centre. The recycling centre is located in the Town of Turner Valley. The recycling fee is $12 bimonthly ($6 monthly). The Oilfields Recycling Centre accepts newsprint, white bond paper, corrugated cardboard, clear glass, cell phones, hard and soft plastics, electronics, and clothing donations. Capital Paper collects almost all the recyclable material from the centre. Electronics are collected through Alberta Recycling Management Authority (ARMA). T&T Disposal Services Ltd. charges $20 per monthly to collect recycling material from the 19 subscribed households (2% of households).

TOWN OF NANTON

TETRA TECH

Town of Nanton

Description	Metric
Population	2,132
Annual MSW Disposal Rate (tonnes)	750
Per Capita Disposal (tonnes/year)	0.35
Diversion Rate	--
Landfill Tipping Fee ($/t)	--
Recycling Cost	$5.00/month
Collection schedule	Weekly garbage collection
Recycling Volumes (t/yr)	--

COMMUNITY OVERVIEW

The Town of Nanton is located 80 km south of Calgary, at the junction of Highways 2 and 533. In 2011, the population was 2,132 with 957 households (Statistics Canada 2012). Based on Canadian census data, the population increased by 3.7% from the 2006 to 2011.

EXISTING WASTE MANAGEMENT SYSTEM

The Town of Nanton provides weekly manual garbage collection. Each residence is permitted three bags of garbage that are contained in a covered receptacle. The cost of residential garbage collection is $22.00 bimonthly and is charged on the utility bill. Excess garbage tags are available for $2.00 each. Garbage is collected every Monday by Progressive Waste Solutions Ltd. and disposed at the Foothills Regional Landfill.

The Town of Nanton is only responsible for residential garbage. The ICI sector is responsible for making their own arrangements with private sector haulers.

RECYCLING PROGRAM AND INITIATIVES

The Town of Nanton offers the following “Special Collection Programs” free of charge:

- Spring clean-up (once a year);
- Tire collection;
- Tree branches, leaves, grass; and
- Electronics (all year).

The Nanton Recycling Depot was established in 1978. The Town of Nanton assumed operations of the Nanton Recycling Depot seven years ago. The Nanton Recycling Depot receives materials about 200 vehicles per day resulting in a stable volume of recyclables every year. The depot collects cardboard, tin cans, newspapers and magazines, mixed paper, rigid plastic containers (labelled #1, #2, and #4 only), plastic milk jugs, telephone books and catalogues. The cost of the recycling depot is charged to households at $5.00 bimonthly ($2.50 per month).

The depot has a cardboard compactor and a 25 year old baler, which has the capacity of producing 30 bails per month. Each bail is about 1,000 lbs. Capital Paper collects the cardboard bails and send them to Oregon for recycling. Other paper and plastics are also collected by Capital Paper. Glass is not recycled because of its low value. Tires are collected through Alberta Recycling Management Authority (ARMA) programs. Used oil is also accepted at the depot; however, there is currently no contract in place for processing of this material.

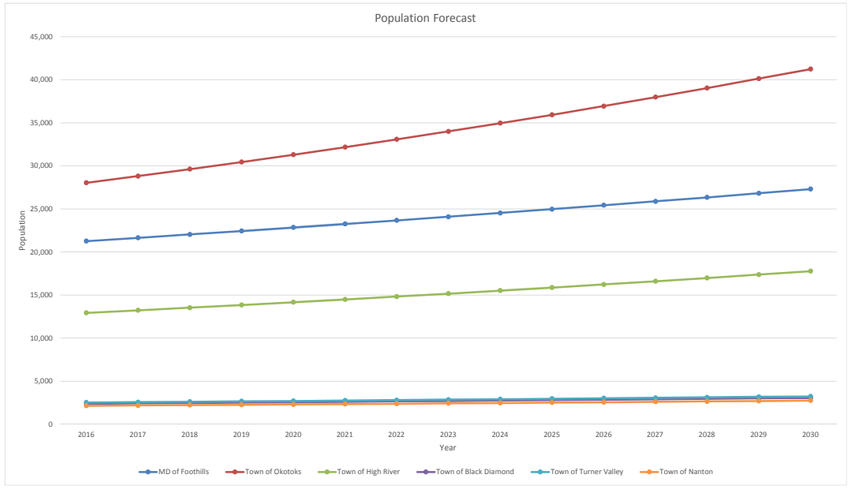
APPENDIX C

WASTE FORECASTING CALCULATIONS

COMMUNITY INFORMATION

Population Forecast

Municipality	Population																								
	% change	Reference	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
MD of Foothills	180%	2015 Alberta's population growth rate	21,258	21,640.64	22,030.18	22,426.72	22,830.40	23,241.35	23,659.69	24,085.57	24,519.11	24,960.45	25,409.74	25,867.11	26,332.72	26,806.71	27,289.23	27,780.44	28,280.48	28,789.53	29,307.75	29,835.28	30,372.32	30,919.02	31,475.56	32,042.12
Town of Okotoks	3%	Average from 2001 to 2011 from the Okotoks Growth Study and Financial Analysis (2016 -12,000 and 2040 - 40,000)	28,016	28,800.45	29,606.86	30,435.85	31,288.06	32,164.12	33,064.72	33,990.53	34,942.26	35,920.65	36,926.43	37,960.37	39,023.26	40,115.91	41,239.15	42,393.85	43,580.88	44,801.14	46,055.57	47,345.13	48,670.79	50,033.58	51,434.52	52,874.68
Town of High River	233%	Town of High River and MD of Foothills - North Annexation Open House	12,920	13,217.16	13,521.15	13,832.14	14,150.28	14,475.74	14,808.68	15,149.28	15,497.71	15,854.16	16,218.80	16,591.84	16,973.45	17,363.84	17,763.21	18,171.76	18,589.71	19,017.28	19,454.67	19,902.13	20,359.88	20,828.16	21,307.20	21,797.27
Town of Black Diamond	180%	2015 Alberta's population growth rate	2,373	2,415.71	2,459.20	2,503.46	2,548.52	2,594.40	2,641.10	2,688.64	2,737.03	2,786.30	2,836.45	2,887.51	2,939.48	2,992.39	3,046.26	3,101.09	3,156.91	3,213.73	3,271.58	3,330.47	3,390.42	3,451.45	3,513.57	3,576.82
Town of Turner Valley	180%	2015 Alberta's population growth rate	2,511	2,556.20	2,602.21	2,649.05	2,696.73	2,745.27	2,794.69	2,844.99	2,896.20	2,948.33	3,001.40	3,055.43	3,110.43	3,166.41	3,223.41	3,281.43	3,340.50	3,400.63	3,461.84	3,524.15	3,587.59	3,652.16	3,717.90	3,784.82
Town of Nanton	180%	2015 Alberta's population growth rate	2,132	2,170.38	2,209.44	2,249.21	2,289.70	2,330.91	2,372.87	2,415.58	2,459.06	2,503.32	2,548.38	2,594.26	2,640.95	2,688.49	2,736.88	2,786.15	2,836.30	2,887.35	2,939.32	2,992.23	3,046.09	3,100.92	3,156.74	3,213.56
		Total Population	69,210	70,801	72,429	74,096	75,804	77,552	79,342	81,175	83,051	84,973	86,941	88,957	91,020	93,134	95,298	97,515	99,785	102,110	104,491	106,929	109,427	111,985	114,605	117,289



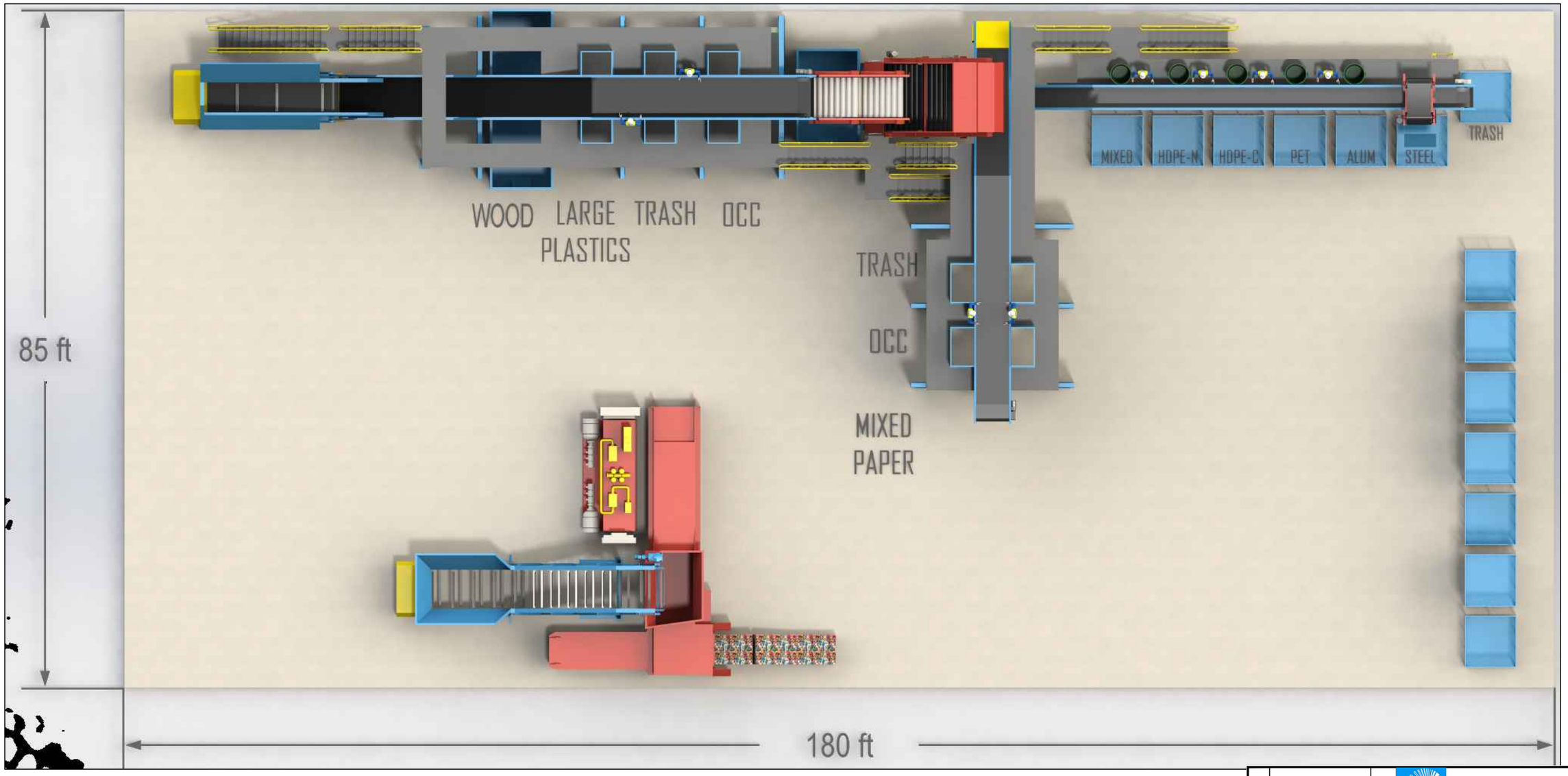
MRF Demand Calculation

Municipality	2036	People per Household	number of households	Recycling at 0.2 t/hh
MD of Foothills	30,372.32	2.710	11207	2241.5
Town of Okotoks	48,670.79	3.140	15500	3100.1
Town of High Rive	20,359.88	2.361	8623	1724.7
Town of Black Dia	3,390.42	2.371	1430	286.0
Town of Turner Va	3,587.59	2.320	1546	309.3
Town of Nanton	3,046.09	2.280	1336	267.2
TOTAL	**109,427**			**7928.7**

	Peak	Average
Monthly	872.16	660.72
Hourly	5.45	4.13

APPENDIX D

MRF CONCEPTUAL DESIGN AND COST ESTIMATES (RRT REPORT)



NOT FOR CONSTRUCTION

PRELIMINARY TO REV. A 10/21/16

RRT DESIGN & CONSTRUCTION
A Service of Enviro-Services & Constructors, Inc.

OKOTOKS PROJECT

PRELIMINARY PLANT LAYOUT
GENERAL ARRANGEMENT

REV	DESCRIPTION	DATE	BY
	PRELIMINARY TO REV. A	10/21/16	

DRAWN | DATE | PROJ. No: 873-001 | SCALE:
CHECKED
DESIGNED | DWG. NO.: M-02
APPROVED | CAD FILE:
APPROVED | SHEET SIZE: B-11x17 | REV

RRT Design & Construction
ENGINEERING ARCHITECTURE CONSTRUCTION
1 Huntington Quadrangle, 3S01
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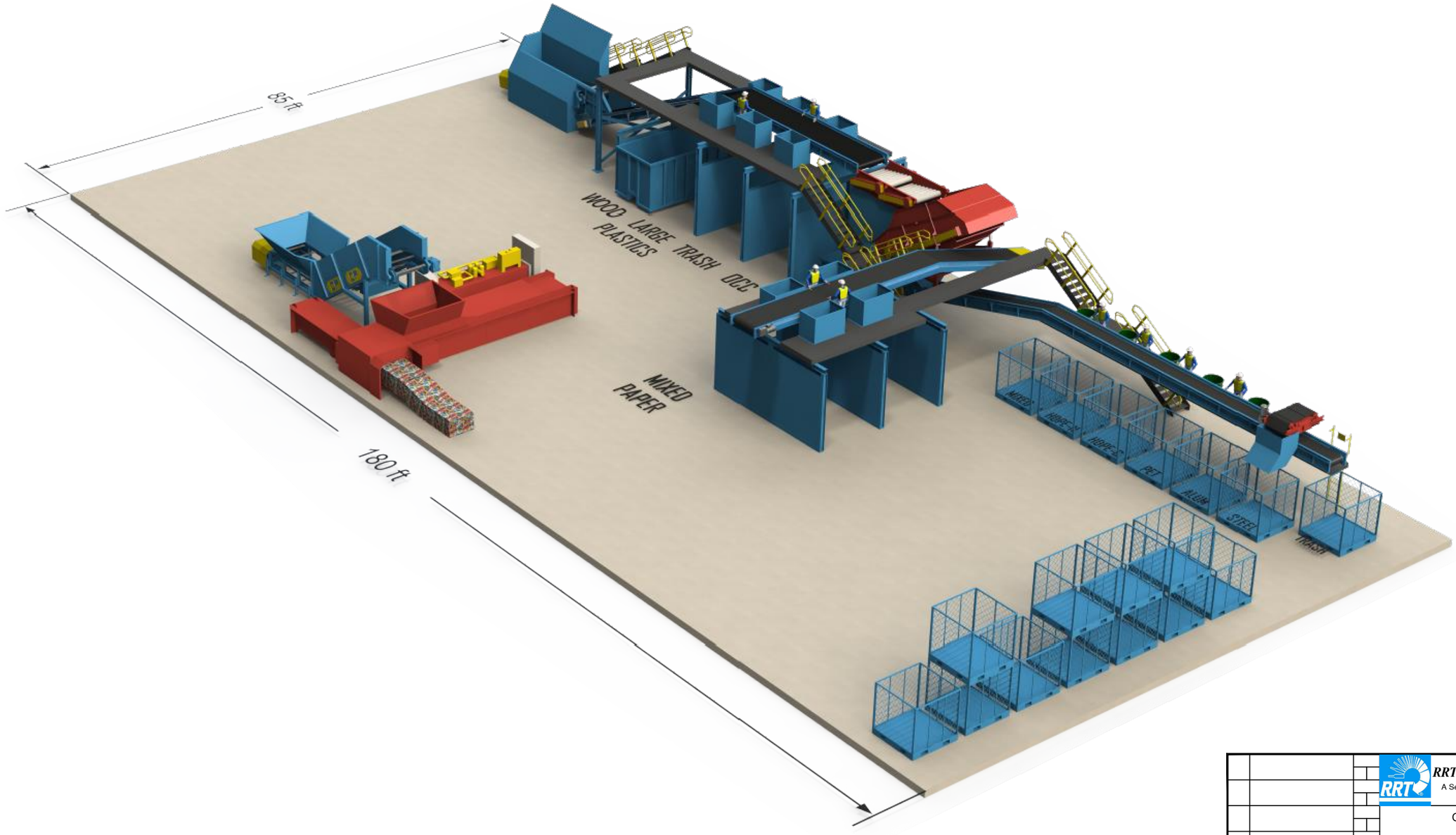
fax: 631-756-1064



NOT FOR CONSTRUCTION

PRELIMINARY TO REV. A 10/21/16

RRT DESIGN & CONSTRUCTION
A Service of Enviro-Services & Constructors, Inc.

OKOTOKS PROJECT

PRELIMINARY PLANT LAYOUT ELEVATION

REV	DESCRIPTION	DATE	BY
	PRELIMINARY REV. A	10/21/16	

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APPROVED	

PROJ. No: 873-001 SCALE:

DWG. NO.: M-03

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SHEET SIZE: B–11x17 REV

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February 3, 2017

Tetra Tech EBA Inc.
885 Dunsmuir Street
Suite 1000
Vancouver, BC V6C 1N5

Attn: Mr. Wilbert Yang, P. Eng.
Senior Waste Management Engineer

Re: Town of Okotoks MRF Information – Final Report

Dear Mr. Yang:

RRT Design & Construction is pleased to submit our final Town of Okotoks MRF Information Report in support of the Regional Waste Management and MRF Study which our team is currently developing.

1.0 Background

The team of Tetra Tech EBA Inc., RRT Design & Construction and Stack'd Consulting have been commissioned to provide a Regional Waste Management and MRF Study for the Town of Okotoks, located in Alberta, Canada. RRT's scope for the project is to provide to Tetra Tech information and deliverable items for planning purposes for a potential future MRF located on the existing landfill site. RRT's deliverables for the project include:

- Provide a conceptual design (including site layout) for a MRF that would suit the regional needs over a 20 year period. In support of this design work, Tetra Tech has provided the 20 year design throughput and collection approach. Refer to Attachment C of this report.
- Advise on minimum facility footprint. Refer to Section 5.0 of this report.
- Provide a design based on a one-shift approach (e.g. 8 hours per day). This will include a simplified Process Flow Diagram and Mass Balance. Refer to Attachments A and B of this report.
- Identify components that would be recommended for the MRF and provide all costs associated with design, procurement, installation, etc. Tetra Tech to provide certain unit costs. Refer to Sections 3.0 and 8.0 of this report.
- Identify location of components on a conceptual facility plan and provide high level narrative for each component. This will include an equipment list and associated narratives. Refer to Section 3.0 and Attachment A of this report.
- Provide capital cost to design, build and commission the MRF. Refer to Section 8.0 of this report.

- Discuss how long it would reasonable take to design, procure and build a MRF (text table will discuss likely timeline and range of short and long timeframes). Refer to Section 7.0 of this report.
- List labour requirements and calculate annual operating costs (including labour, utilities, etc.) Tetra Tech to provide certain unit costs. Refer to Section 4.0 of this report.
- List commodities that are likely to be sorted, baled and taken to market (i.e. recovered commodities). Through past projects, Tetra Tech will summarize market values for the various commodities that would be recovered. Refer to Section 6.0 of this report.
- Identify options to increase plant efficiency (i.e. processing more recyclables from communities outside the region, adding an extra shift, etc.). Refer to Section 3.0 of this report.
- This revised draft report constitutes the technical memorandum, including respective drawings that summarize the points noted above and provides our deliverables package in support of the project. Based upon review and comments by Tetra Tech, this report will be finalized.

2.0 Planned Year 20 Processed Tonnages and Composition

Based upon information provided by Tetra Tech and further analysis conducted by RRT, Table 2.1 below summarizes the key operational data that has been used to formulate the preliminary Design Basis for the MRF.

Table 2.1 Design Basis Criteria and Operational Data

Design Basis Criteria	Operational Data
20-Year Single Family Residential Single Stream Annual Capacity	7,000 Tons per Year
Operating Days Per Year	250 Days per Year
Average Residential Single Stream Processed Per Week	135 Tons Per Week
Single Shift Operation	8 Hours per Day
System Run Hours Per Day	7 Hours per Day
Processed Residential Single Stream Per Day	28 Tons per Day
Processed Residential Single Stream Per Hour	4 Tons per Hour
Residential Single Stream Processing	First Shift
Commercial Sector Processing	Second Shift

Note:
All tonnage data is presented in Metric Tonnes.

Tetra Tech has identified that the material composition for the facility will be similar to the City of Edmonton's residential and commercial single stream material. In 2015, RRT worked extensively with Tetra Tech on a project for the City of Edmonton MRF. Among many other elements, the Edmonton project included the planning of upgrades to the existing MRF process systems. As part of this work RRT obtained the 2014 composition of Edmonton's recyclable waste streams. For reference purposes, Table 2.2 below summarizes the City of Edmonton recyclable material stream.

Table 2.2 City of Edmonton Reference Waste Stream Data

City of Edmonton 2014 Material Stream	Tonnage Data
Inbound Residential Single Stream	32,704 Tons
Inbound Commercial Material	13,337 Tons
Total Inbound Material Processed	46,041 Tons
Residential Single Stream Percentage	71% Residential of Total Recyclable Waste Stream
Commercial Material Percentage	29% Commercial of Total Recyclable Waste Stream

Note:
All tonnage data is presented in Metric Tonnes.

For the Town of Okotoks Project, we have analyzed the Edmonton data and provide the expected Okotoks material composition in Table 2.3 below. The composition is based on processed outbound materials and includes both residential and commercial materials. This composition will serve as the Basis of Design material composition for the Town of Okotoks MRF.

Table 2.3 Expected Material Composition for Town of Okotoks MRF

Material	Material Composition Percentages
ONP / Mixed Paper	47.6%
OCC	21.9%
Steel Cans	1.0%
Scrap Metal	0.8%
Aluminum Cans	0.1%
HDPE (N)	0.2%
HDPE (C)	0.8%
PET	0.2%
Mixed Plastics (3 – 7)	0.6%
Rigid Plastics	0.3%
Film	0.4%
Glass	10.8%*
Wood	0.2%
Other Transferred Materials	1.8%
Residual Waste	13.3%*
Total	100.0%

Note:
At Edmonton, the facility stopped recovering glass in 2014. They now let glass transfer to residue. Based upon data from other similar residential single stream systems, we have allocated an additional 10% for glass and reduced the Residual Waste accordingly.

Addition Notes Regarding Materials Processed and the MRF:

- Recyclable materials will be collected in commingled, single stream carts and delivered to the MRF in compaction recycling trucks.

- The Town of Okotoks is considering a plan to build their MRF on the existing landfill site. Further discussion of the preferred location on the landfill site is required, however the MRF will not be constructed on an area that is on top of landfilled waste. Pictured below is an aerial view of the Town of Okotoks Landfill.

3.0 Operations Description, Equipment List, Process Flow Diagram and Mass Balance

Based upon analysis of the data provided by Tetra Tech and from the City of Edmonton project, we have developed a preliminary Process Flow Diagram and Mass Balance. The Process Flow Diagram is included as Attachment A to this report. The Mass Balance is included as Attachment B to this report. Utilizing these analyses and working with CP Group, we have developed a preliminary MRF system and building layout which is included as Attachment C to this report.

The below operations description describes all processes which will occur in the MRF. Following this Operations Description is the Equipment List for the MRF.

The MRF will be designed in order to safely and efficiently process 7,000 tons per year of residential single stream material on the first shift. The balance of the first shift, or a second shift as the program expands, will be utilized to process commercial materials. By designing the facility to process the full 20-year residential tonnage on the first shift, this will allow a second shift to be added to handle additional tonnage (including potential expansion of residential tonnage and/or commercial processing in the future).

This design and operating methodology will maximize the processing capacity of the MRF while keeping initial capital costs down. The MRF will be designed to be both operationally efficient and cost effective for processing recyclable materials. The MRF will be designed in accordance with all applicable safety and environmental codes.

Operations Description

Single Stream material will be delivered to the MRF and unloaded onto the tipping floor. A Front End Loader operator will inspect the material as received and remove large, non-recyclable contaminants (such as box springs, mattresses, large hoses, engine blocks, etc.) utilizing the loader. The large contaminants will be placed into a rolloff container. The remaining single stream material will be fed by the Front End Loader onto an above ground infeed conveyor. The infeed conveyor will be variable speed driven which will assist in maintaining an even flow of material to the downstream processes.

The infeed conveyor will transfer material to the elevated Pre-Sort platform. At Pre-Sort, materials will be manually sorted as follows:

- OCC will be manually sorted and deposited through sorting chutes located on each side of the Pre-Sort conveyor and dropped into a steel bunker located below the Pre-Sort platform. When the OCC bunker is full, OCC will be transferred by the Front-End Loader and fed to the baler feed conveyor for baling.
- Large Reject material (including film bags) will be manually sorted and deposited through sorting chutes located on each side of the Pre-Sort conveyor and dropped into a steel bunker located below the Pre-Sort platform.
- Scrap Metal and Rigid Plastics will be manually removed and dropped into dedicated self dumping hoppers located in a steel bunker on the process floor below the Pre-Sort platform. This third bunker will also be utilized to collect other large materials when processing commercial, such as bulky plastics, wood or bagged shredded paper. When these bunkers are full, the material will be transferred by the Front End Loader into rolloff containers.

After Pre-Sort, the material stream will discharge onto a screen that will separate fines material (broken glass, dirt, caps, lids, small shredded fiber, etc.) This material will be discharged into a hopper located below the screen. When full, this hopper will be handled by forklift and unloaded into a rolloff container dedicated for fines material and broken glass.

The overs material from the fines screen will discharge onto a Fiber/Container Separation Screen (or Ballistic Separator) which will separate fiber from containers. The overs from this unit will transfer to the elevated Fiber Sorting Line. The unders/backs from this unit will transfer to the elevated Container Sorting Line.

Each of the elevated sorting lines, including Pre-Sort will be accessible by stairways from the floor and interconnected by elevated stairways and walkways. The screens will be able to be accessed from each side for maintenance and cleaning. All sorting positions will be equipped with safety, pull-cord lanyards so that the sorting lines and upstream equipment can be stopped in the event that large material must be removed or in case of emergency. Emergency Stop devices will also be located throughout the facility in accordance with all applicable safety codes.

On the elevated Fiber Sorting Line, materials will be sorted as follows:

- OCC that was not sorted at Pre-Sort will be manually sorted and deposited through sorting chutes located on each side of the Fiber Sort conveyor and dropped into a steel bunker located below the Fiber Sort platform.
- Trash, film, and non-recyclable material will be manually sorted and deposited through sorting chutes located on each side of the Fiber Sort conveyor and dropped into a steel bunker located below the Fiber Sort platform.
- Containers incorrectly sorted by the Fiber/Container Separation Screen will be manually sorted and placed into barrels located at the sorting stations. When full these barrels will be deposited into a chute which will automatically transfer to the container line.
- ONP and Mixed Paper will be negatively sorted and will discharge from the end of the sort line into a steel bunker located below the Fiber Sort platform.
- When the fiber bunkers are full, the fiber will be transferred by the Front-End Loader and fed to the baler feed conveyor for baling.

On the elevated Container Sorting Line, materials will be sorted as follows:

- Each grade of plastic (PET, HDPE (N), HDPE (C), Mixed Plastics) will be manually sorted and deposited through a toss-across sorting chute and will discharge and be stored in rolling hoppers located underneath the Container Line platform.
- Aluminum will be manually sorted and deposited through a toss-across sorting chute and will discharge and be stored in a rolling hopper located underneath the Container Line platform.
- Barrels will be placed along the Container Sorting Line so that each sorter has an opportunity to manually remove fiber that is incorrectly separated by the upstream equipment. When full, the barrels will be emptied onto the fiber sort line, or appropriate fiber bunker.
- An overhead magnet will automatically remove steel cans and metal from the container stream. Metals will discharge into and be stored in a rolling hopper located underneath the Container Line platform.
- The remaining non-recyclable trash will be negatively sorted and will discharge from the end of the sort line into a rolloff container located on the floor underneath the discharge of the Container Line. When full, the trash rolloff container will be hauled to the landfill.
- When each of the rolling container storage hoppers are full, they will be handled by forklift, and emptied onto the baler feed conveyor for baling.

The Town of Okotoks purchased and commissioned in June 2016, a Machinex roller-chain belt style, above floor baler infeed conveyor and an American Baler, Model W721-T75 for baling materials. This baling system is currently located at the Town's Eco-Center which is located approximately 5 km away from the landfill site. This baling system will be relocated and used as-is at the new MRF for baling all recovered materials. The photos below show this new baling system.

The MRF Processing System will be designed to include a fully integrated, PLC based, Touch-Screen Control Panels with Graphic Display and digital controls system for facility monitoring, automatic operating controls, safety controls and interlocks, manual overrides, stop, standby, start and function without harm under the maximum and minimum ambient environment conditions.

Bale storage will occur in an adjacent, separate shed that is connected to the building. Bales will be loaded out to trailers via forklift utilizing a movable bale loadout ramp. Due to weather conditions, the loadout ramp will be located inside the bale storage area shed.

MRF Equipment List

The MRF processing equipment, rolling stock and other MRF components are listed below in Tables 3.1 and 3.2. Note that these equipment lists are based upon our current MRF design and will be reviewed further as we proceed through this project.

Table 3.1 MRF Process Equipment List

Processing Equipment	Number of Units
Above-ground Infeed Conveyor; 60” wide; horizontal section equipped with feed hopper	1
Elevated steel Pre-Sort Platform with access stairways, ladders and handrails	1
Steel Wall Pre-Sort Bunkers	3
Pre-Sort Conveyor; 60” wide; equipped with six (6) sorting chutes	1
Fines Screen with discharge chute and supports	1
Fiber/Container Screen / 8-Paddle Ballistic Separator with discharge chutes and supports	1
Elevated steel Fiber Sorting Platform with access walkways and handrails	1
Steel Wall Fiber Sorting Bunkers	3
Fiber Sorting Conveyor; 36” wide; equipped with four (4) sorting chutes	1
Elevated steel Container Sorting Platform with access stairways, walkways and handrails	1
Container Sorting Conveyor; 30” wide; equipped with five (5) sorting chutes	1
Ferrous Magnet	1
System Controls Package	1
Baler Infeed Conveyor (Existing)	1
Baler (Existing)	1

Table 3.2 MRF Rolling Stock and Containers List

Rolling Stock and Containers	Number of Units
Front-End Loader	1
Forklift	1
Self dumping hoppers (5 cubic yards)	3
Rolloff Containers	4 – 5
Rolling Container Storage Hoppers	12
Movable Bale Loadout Ramp	1

Over the life of the MRF, based upon performing regular preventive maintenance in accordance with equipment manufacturer's requirements, a majority of the MRF process equipment can be expected to operate for up to 20 years. Wear parts such as conveyor belts, pulleys, return idlers, skirting, screen shafts and discs and certain chutework will require replacement based upon many factors including maintenance practices, tonnages processed and general wear and tear of processed material on the equipment.

4.0 Preliminary Staffing Plan and Estimated Operating Costs

Based upon the Process Flow and Mass Balance, we have prepared a preliminary staffing plan for the facility. Table 4.1 below presents the Preliminary Staffing Plan.

Table 4.1 Preliminary MRF Staffing Plan

Position	Number of Personnel
Plant Manager	1
Administration	1
Plant Foreman / Equipment Operator	1
Front-End Loader Operator	1
Mechanic	1*
Pre-Sort Line Sorters	2
Container Line Sorters	3 – 5
Fiber Line Sorters	3 – 4
Total Staff	12 – 16

Note:
In order to reduce operating costs, the MRF Mechanic could potentially be shared with Landfill Operations.

The range of sorters estimated for the Container Line and Fiber Line is required in order to allow for the light weighting that is occurring for containers and to handle the potential fluctuations in material composition that could be expected for containers and fiber.

Table 4.2 below presents high level, budgetary operating costs for the MRF. We have provided operating cost estimates on a per ton basis for labor, maintenance and amortization costs. The high level, budgetary operating costs are based upon recent industry standards for residential single stream MRFs.

Table 4.2 High Level, Budgetary MRF Operating Costs

	Cost Per Ton
Labor Costs	$45 to $60 per ton
Maintenance Costs	$4 to $6 per ton
Debt / Amortization Costs	$20 to $25 per ton

5.0 Approximate Building Size (Footprint)

This section summarizes the approximate MRF building size (footprint) and features of the building required for the MRF.

- Based upon our system layout, including tipping areas, areas for all equipment and systems, and an area for an office and break room, we estimate that the building footprint size will be approximately 15,000 square feet.
- The MRF building will be a pre-engineered, metal building.
- Building clear height should be 30 feet.
- All equipment will be above ground.
- The MRF will require a tipping area of approximately 2,000 square feet. At an average storage height of 10 feet, a total of three (3) day's storage of incoming material will be provided (approximately 85 tons).
- Bale storage will occur in an adjacent, separate shed that is connected to the building. The shed will be approximately 2,500 square feet in size. Loadout of baled materials will utilize a movable bale loadout ramp rather than loading docks.
- The purpose of utilizing a movable bale loadout ramp and bale storage shed would be to keep building costs lower. Alternatively, the building could be sized to include an additional 2,500 SF of bale storage space and be equipped with up to two (2) loading docks for loading out of baled products.
- The building will be equipped with one (1) tipping door (26 feet high by 18 feet wide), man doors and one (1) to two (2) additional rollup overhead doors (up to 12 feet high by 8 feet wide).
- Each of the above noted building features will be designed to keep building costs as low as possible.
- Electrical service to the MRF would be approximately 1,000 Amps.

6.0 List of Recovered Materials

Table 6.1 below provides a list of each recovered material type at the MRF, their method of processing and sale to markets.

Table 6.1 List of Recovered Materials

Material Type	Processed / Recovered
ONP / Mixed Paper	Recovered, Baled, Sold to Market
OCC	Recovered, Baled, Sold to Market
Steel Cans	Recovered, Baled, Sold to Market
Scrap Metal	Recovered, Loose in Rolloff, Sold to Market
Aluminum Cans (UBC/Bi-Metal/Foil combined)	Recovered, Baled, Sold to Market
HDPE (N)	Recovered, Baled, Sold to Market
HDPE (C)	Recovered, Baled, Sold to Market
PET	Recovered, Baled, Sold to Market
Mixed Plastics (3 – 7)	Recovered, Baled, Sold to Market
Rigid Plastics	Recovered, Baled, Sold to Market
Wood	Recovered, Loose in Rolloff, Sold to Market
Glass / Fines	Recovered, Loose in Rolloff, Landfilled or shipped off-site for further processing
Film	Not recovered, included with residue and Landfilled
Residue	Stored in Rolloff Containers, Landfilled

7.0 Project Schedule

Based upon our experience in the design, installation and commissioning of MRFs, this section summarizes the approximate project schedule, from Notice to Proceed through Project Completion, presenting approximately how long it would reasonably take to design, procure and build the MRF. Table 7.1 below presents the approximate time frames for each key milestone for the project.

Table 7.1 Approximate Project Schedule

Activity	Approximate Timeframe
Conceptual Process Design	2 weeks
Final System and Building Design	6 weeks
Approval of Final Design	2 weeks
Permit Submittal and Approval	6 weeks
Fabrication and Delivery of Equipment	20 weeks
Building Construction	Concurrent with Equipment Fabrication and Delivery
Equipment Installation	4 weeks
Commissioning and Project Completion	2 weeks
Total Project Timeframe	42 weeks

8.0 Preliminary, High Level Equipment Cost Estimate

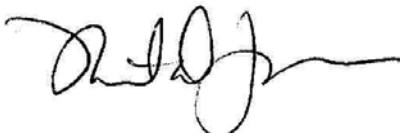
Based upon our equipment system layout, we have provided a high-level, budgetary cost estimate for the Process Equipment (listed in Table 3.1 above, excluding the existing baler infeed conveyor and existing baler) and a high-level, budgetary cost estimate for the MRF rolling stock/equipment and containers (listed in Table 3.2 above).

The preliminary, high level budgetary equipment cost for the MRF is in the $1.8M USD range. This includes all equipment listed in Tables 3.1 and 3.2, excluding the existing baler infeed conveyor and baler, excluding the building (as we understand Tetra Tech will estimate the cost of the building based upon the footprint information we have provided), including the System Controls Package, design and procurement of the system, freight to the site, mechanical and electrical installation and commissioning of the processing system.

We appreciate the opportunity to provide Tetra Tech with our initial deliverables and we hope this information is of value to you. We look forward to continuing our work with you on this important project.

Very truly yours,

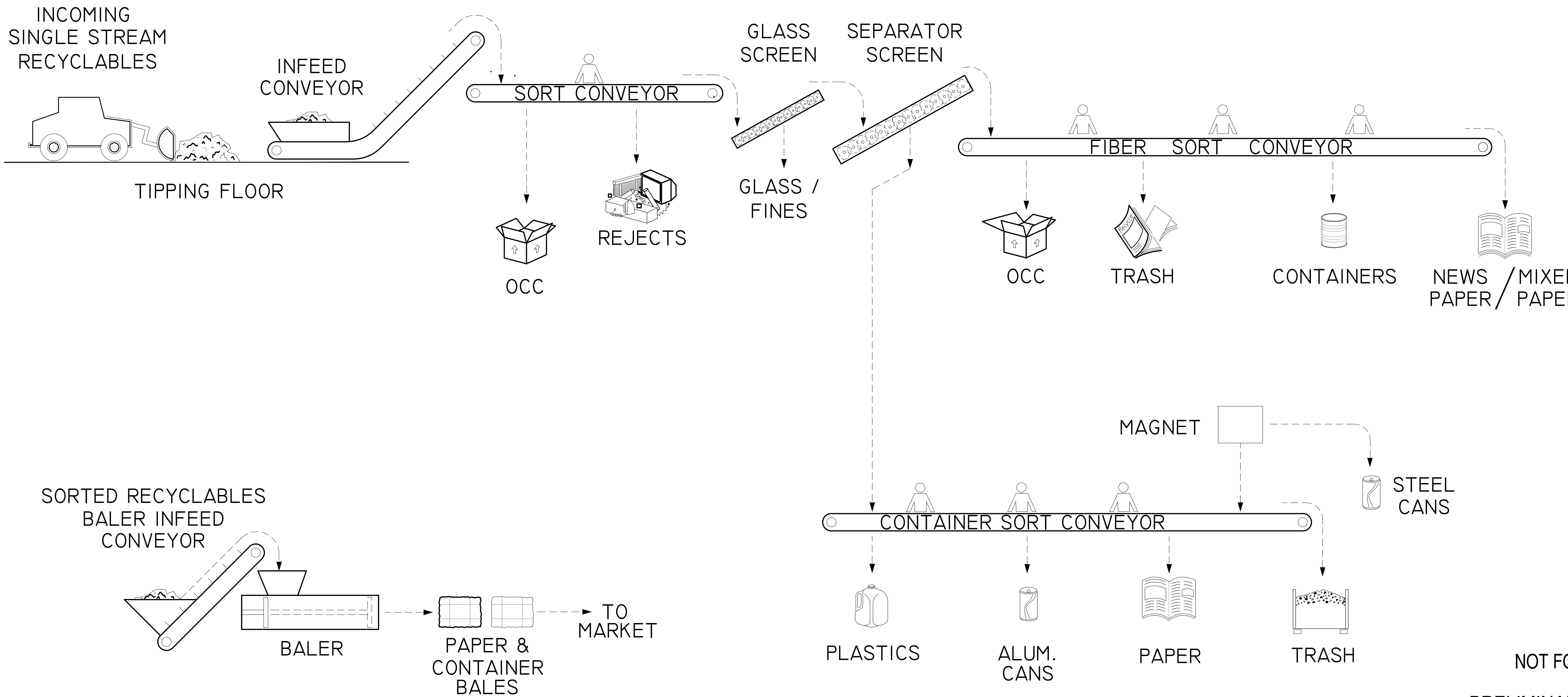
RRT DESIGN & CONSTRUCTION



Michael Jones
Systems Engineering Manager

Attachment A: Preliminary Process Flow Diagram
Attachment B: Preliminary Mass Balance
Attachment C: Preliminary Building Layout

ATTACHMENT A



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OKOTOKS PROJECT

PRELIMINARY PROCESS FLOW DIAGRAM

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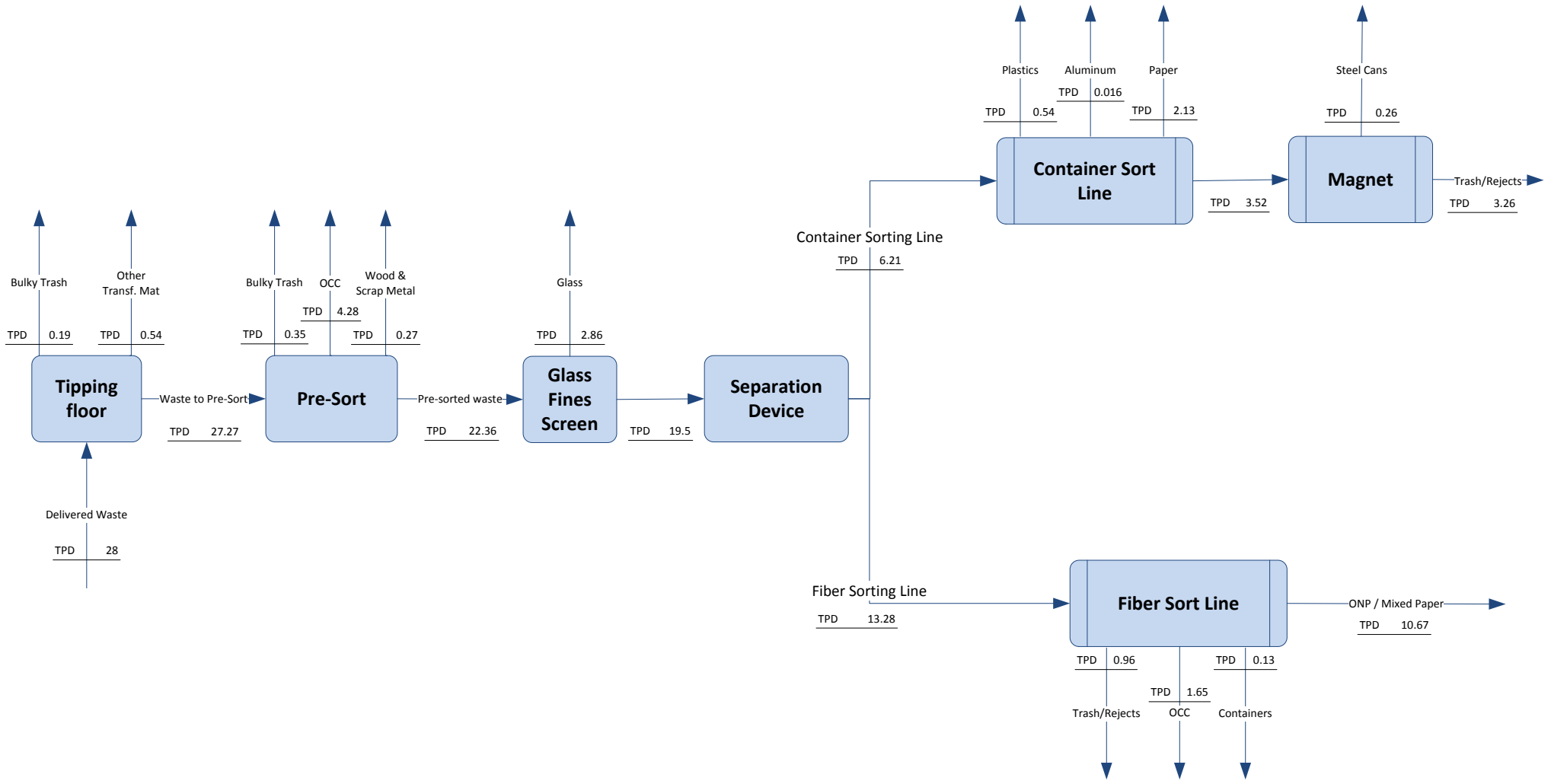
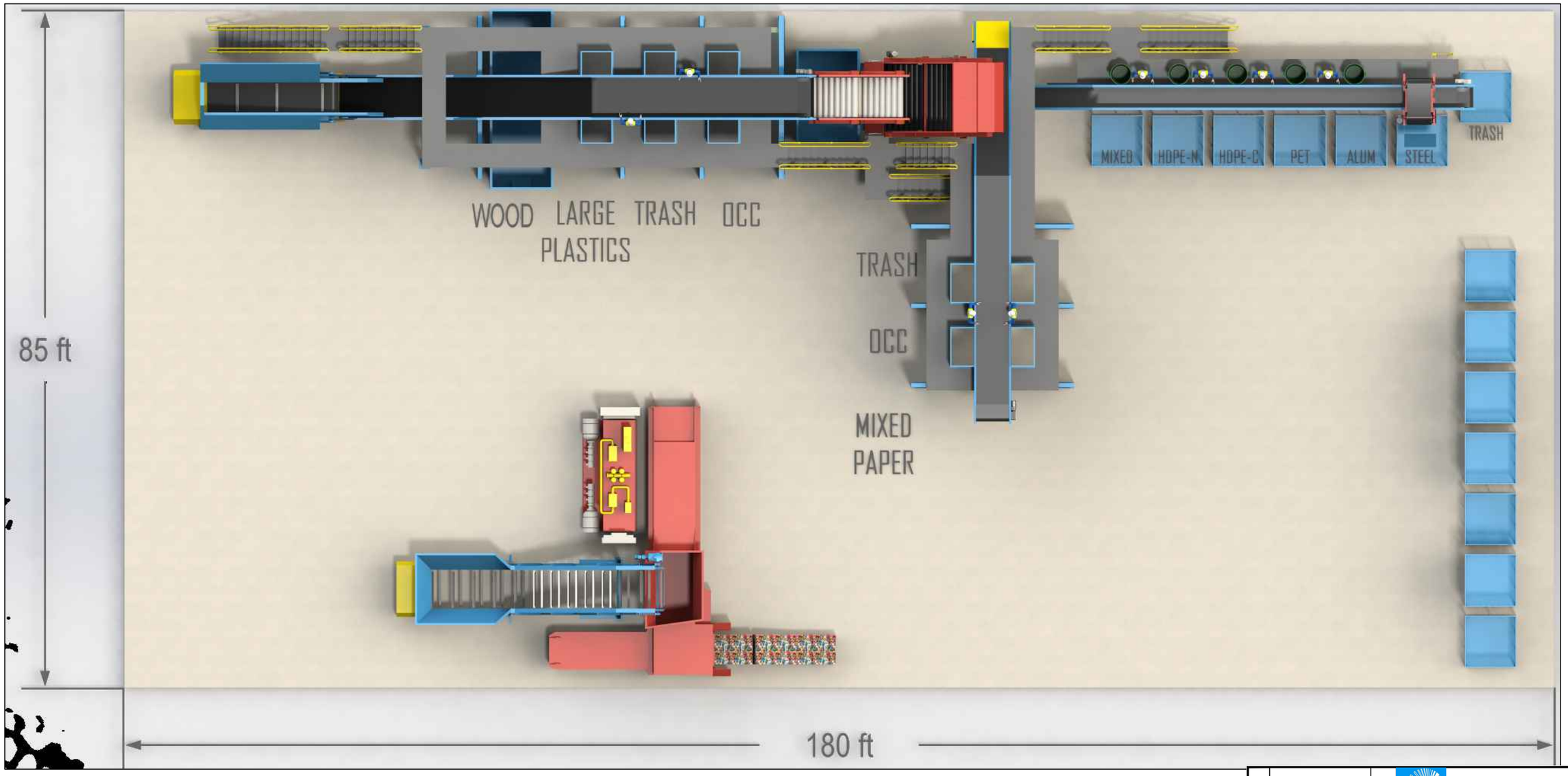
ATTACHMENT B

OKOTOKS Project, Preliminary Mass Balance

September 30, 2016



ATTACHMENT C



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OKOTOKS PROJECT

PRELIMINARY PLANT LAYOUT
GENERAL ARRANGEMENT

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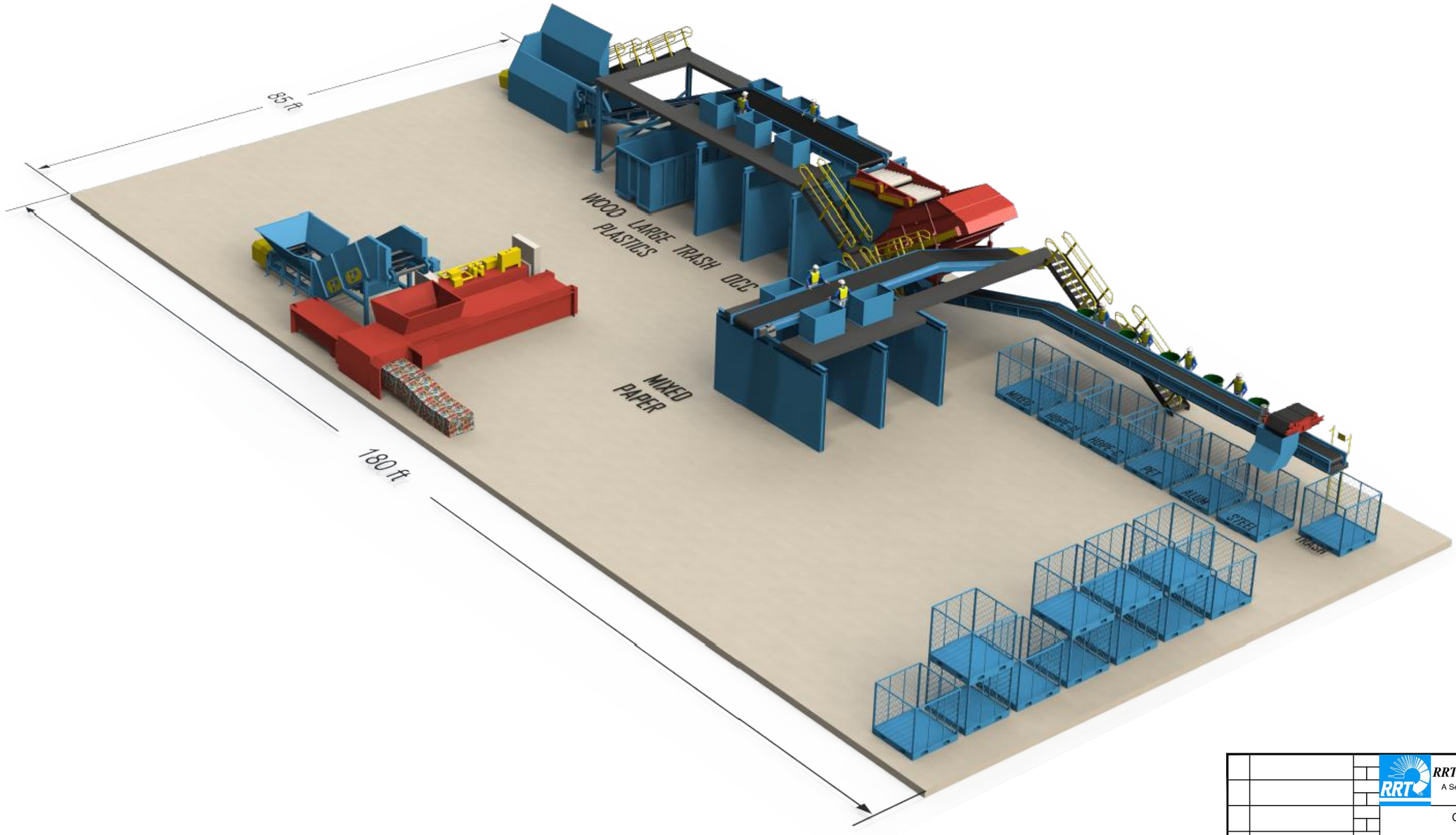

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OKOTOKS PROJECT

PRELIMINARY PLANT LAYOUT ELEVATION

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APPENDIX E

REGIONAL CURBSIDE COLLECTION COSTS SUMMARY

Regional Curbside Collection Costs

Table 1. Current System - Population and Waste Numbers (2015)

	Population	Total (tonnes)	Garbage (tonnes)	Recyclables (tonnes)	Approximate Number of Households	Tonnes/Household
Okotoks	27,331	11,735	10,135	1,600	8,000	1.5
High River	12,920	11,291	10,191	1,100	5,500	2.1
Black Diamond	2,373	1,228	1,028	200	1,000	1.2
Turner Valley	2,167	1,098	898	200	1,000	1.1
Nanton	2,132	749	569	180	900	0.8
MD of Foothills	21,258	574	494	80	400	1.4
	Total	**26,674**	**23,314**	**3,360**	**16,800**	

Notes:

Only includes households with existing curbside garbage collection service.

Table 2. Diversion Assumptions

Curbside Recycling Collection - Industry Standard Diversion Rate	
0.2	tonnes of recyclables/household per year

Table 3. Regional Estimated Collection Costs

Scenario	**Weekly Garbage and Recyclables Collection**		
	Garbage	**Recycling**	
Tonnes total projected	23,314	3,360	
kg/house **weekly** (one collection day/home)	27	4	
kg of material on **collection** week	448,347	64,615	
Overall Weekly Route Setup (Based on Total Tonnage to Collect)			
kg / truck load (capacity)	8,000	4,000	
Number of collection days per week	5	5	
Target number of homes collected per day	3,360	3,360	
Average number of HH per day per truck (best practice)	700	700	
Average number homes before truck is FULL	300	1,040	
Average number of routes per day	11	3	
Number of trucks needed for best practice collection performance	5	5	
Number of trucks needed (based on 8 hour day)	9.6		
Major Costs Influencing Overall Collection Costs - Capital Costs			
Capital Fleet			
Total Number of Trucks	9.6		
Actual Number of Trucks	0	5	As per client discussion, it is assumed the region has
Cost per Truck	$375,000	$375,000	enough garbage trucks to support the collection.
Total Fleet Capital	$0	$1,875,000	Therefore, the cost of acquiring garbage trucks has not been included in the total cost.
Annual Total Fleet Capital Cost (assume loan over 7 years at 6%)	$0	$335,878	
Total Fleet Capital per Collection Service	$0	$335,878	
Total Fleet Capital Cost per Household per Month	$0.00	$1.67	
Cart Costs			
Total Number of carts	16,800	16,800	
Cost per Cart	$100	$100	
Total Cart Capital	$1,680,000	$1,680,000	
Annual Total Cart Cost (assume loan over 10 years at 6%)	$228,258	$228,258	
Total Cart Capital per Collection Service	$228,258	$228,258	
Total Cart Capital Cost per Household per Month	$1.13	$1.13	
Total Capital Costs per Collection Service	$228,258	$564,136	
Total Capital Costs per Household per Month	$1.13	$2.80	
Major Costs Influencing Overall Collection Costs - Operating Costs (Annual)			
Number of Trucks in Operation	5	5	
Number of Staff Per Truck	1	1	
Number of Staff Needed	5	5	
Truck Driver Salary	$90,000	$90,000	
Total Fleet Labour Costs	$450,000	$450,000	
Estimated Annual Maintenance Costs per Truck	$12,000	$12,000	
Annual Truck Maintenance Cost	$60,000	$60,000	
Annual Fuel Costs ($240/day/truck)	$312,000	$312,000	
Annual 20% of Maintenance/Fuel Costs for Backup Trucks	$74,400	$74,400	
Administration Costs	$100,000	$230,000	
Total Operating Costs per Collection Service	**$996,400**	**$1,126,400**	
Total Operating Costs per Household per Month	**$4.94**	**$5.59**	
Total Capital+Operational Cost Per Year Per Collection Service	$1,224,658	$1,690,536	
Total Collection Costs per Household per Month	**$6.07**	**$8.39**	
Total Costs per Household (monthly)	$14.46		
MRF Cost per Household (monthly)	$4.39		
Total Cost per Household (monthly)	$18.85		

APPENDIX F

REGIONAL WASTE MANAGEMENT SYSTEM GOVERNANCE REPORT

Stack'd exists to deliver exceptional consulting services to our clients.

Regional Waste Management System Governance Report

Final Version

Tetra Tech EBA – Town of Okotoks

Regional Waste Management / MRF Study Project

January 2017

Stack'd CONSULTING

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1.0 Executive Summary

In June 2015, Stack'd Consulting Inc. was engaged by Tetra Tech EBA to perform a governance review for a proposed Regional Waste Management Entity. At central to this study was an assessment of a potential new regional Materials Recycling Facility (MRF). However, the study also extended to consider an entity which could manage the region's collections, processing, and disposal system. The specific objectives as stated by The Town of Okotok's Request for Proposal # 440-04-16 are detailed as:

- *Recommend a governance structure to operate a Regional Waste Management Collection program and Materials Recycling Facility and determine whether it is best to be operated under the existing Foothills Regional Services Commission or operate independently as a business entity.*

Accordingly, this project served to analyze two unique properties for the potential Regional Waste Management System:

1. Analyze and recommend a future service delivery model for the Regional Waste Management System; and
2. Based on this recommended service delivery model, develop a recommended governance structure.

1.1 Regional Engagement

To develop an appropriate governance structure, our project team engaged relevant representatives from each member of the Foothills Regional Services Commission. This was completed to understand the applicable objectives, governance priorities, and issues which require consideration for the proposed Regional Waste Management Collections / MRF Program. Key output from this regional engagement is summarized as follows:

1. **Interest in Waste Diversion Services:** Each municipality noted that they had established priorities to achieve positive environmental outcomes for their respective community;
2. **Priority to Achieve Cost Efficiencies and Value for Money:** When considering potential desired outcomes for new waste diversion services and the potential for a regional service delivery model, each municipality noted a top priority to ensure an efficient service delivery model as possible;
3. **Regional Cooperation:** A general culture of willingness to cooperate with other municipalities within the Foothills region was noted during discussions with municipal representatives;
4. **Positive View of Foothills Regional Services Commission:** The Foothills Regional Services Commission is generally viewed in a positive manner and as an example of a successful partnership model between the region's municipalities;
5. **Single Regional Waste Management Entity:** When discussing governance structure alternatives for overseeing the region's various waste management activities (i.e. landfill, MRF, and / or residential collections), each municipality expressed a preference to establish only a single entity; and
6. **Ensure Sufficient Management & Technical Expertise:** It was also that such a single regional waste management needs to have sufficient management capabilities and technical expertise commensurate with its mandate and scope of responsibilities.

Based on the desired objectives of the proposed Regional Waste Management System and input from the regional stakeholders, a priority list of desired characteristics for a governance model was developed. These priority characteristics are described below:

Characteristic	Description
Efficiency	Degree to which the alternative supports the generation of appropriate cost savings across the region (i.e. for each municipality). Also, the recommended governance model must be committed to and able to demonstrate value for money.
Accountable for Service Delivery	Degree to which the alternative is accountable for service delivery and responsive to municipal expectations for customer service.
Sufficient Management & Technical Capabilities	Degree to which the alternative can deliver a sufficiently appropriate level of managerial capabilities and technical expertise given the mandate, scope of responsibilities, and complexity of the "to-be" regional waste management organization.
Regional Support	Degree to which the alternative receives buy in from member municipalities and stakeholders of the region. While the model must support a holistic and inclusive approach to waste management service delivery, it also must respond to individual municipal service level expectations.

1.2 "To-Be" Regional Service Delivery Model

Based on the net new services envisioned as part of this project, alternative models for a desired "to-be" regional service delivery model were considered. These included the following alternatives:

1. Regional MRF;
2. Regional MRF and Landfill;
3. Regional MRF, Landfill and Collection System.

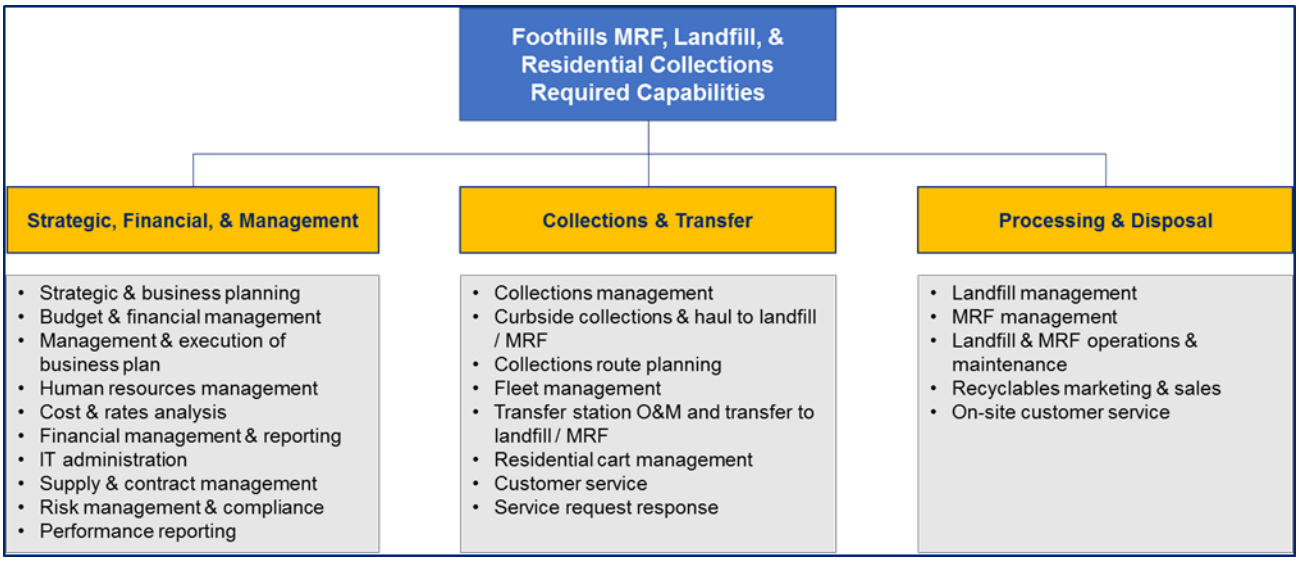
A Regional MRF managed separately from the existing landfill was not preferred due to the following rationale:

- It does not provide any additional operating efficiencies from the existing waste management system;
- It potentially pits the new "To-Be" Regional MRF with the existing Foothills Regional Services Commission in a competition for regional waste stream volumes instead of managing it in a holistic manner.

At a minimum, it was noted that the "to-be" regional service delivery model should encompass both the MRF and landfill. In this way, duplication of resources can be avoided and it would allow the region to manage the processing and disposal functions for its waste shed in a holistic and strategic manner.

Combining this model with regional collection activities was also noted as a potential model of interest. Several municipalities who now outsource curbside collection activities (and hence only administer the collections contract) were interested in evaluating the feasibility of this model. However, it would represent more potential change for municipalities who currently perform these activities with internal resources. Still, based on potential benefits from increased economies of scale, there is merit for the municipalities to further consider this model.

Based on the mandate for this service deliver model alternative, the following list of "to-be" capabilities have been identified:



1.3 "To-Be" Governance Structure

Based on the alternative "to-be" regional service delivery models evaluated, alternative models for a desired regional governance structure were also considered. These included the following alternatives:

1. New Separate Entity;
2. Enhance FRSC Mandate;
3. Municipal Controlled Corporation; and
4. Part 9 Company (Not-for-Profit).

Based on the priority selection criteria, each plausible alternative has been evaluated on a relative basis. The table below summarizes how the plausible alternatives compare to one another:

Criteria	New Separate Entity	Enhanced FRSC Mandate	Municipal Controlled Corporation	Part 9 Company	Evaluative Comments
Efficiency	3	1	2	2	▪ Given mandate to demonstrate lowest possible costs for residential customers within the region, Commission is more stream-lined structure ▪ Commission mandate to specifically focus on pursuit of operational efficiencies and demonstration of value-for-money ▪ If focus shifts to providing more services to ICI or out-of-region customers, then Controlled Corporation becomes more advantageous
Accountable for Service Delivery	3	1	2	2	▪ Municipal Controlled Corporation and Part 9 Company are further arms-at-length structures from municipal shareholders ▪ Elected officials able to bring their local perspectives and priorities to ensure alignment with municipal needs
Sufficient Management & Technical Capabilities	TBD	2	1	1	▪ Both Municipal Controlled Corporation & Part 9 Company can have industry experts on the Board ▪ Commission can hire advisor(s) to assist Board on specific matters and needs to ensure appropriate management team competencies
Regional Support	3	1	2	3	▪ Input from municipal stakeholders is that current Commission model works well for the region and is reflective of desire to collaborate and directly share in governance function

Given the evaluation summary above, it is noted that enhancing the mandate of the existing Foothills Regional Services Commission was the preferred alternative.

1.4 Summary of Recommendations

Based on the analysis and findings from this project, the following recommendations are summarized below:

1. **Approve Regional Recyclables Program:** Based on the technical and costing analysis performed through this project, each municipality first needs to validate and approve its intentions to:
    i. Implement residential recyclables waste diversion services within its community (particularly for those who current do not have curbside recyclables collections); and
    ii. Utilize the proposed regional MRF as concepted through this project.
2. **Service Delivery Model:** Each member municipality within the Foothills Regional Services Commission needs to also review and confirm its preference for a “to-be” regional service delivery model:
    i. At a minimum, a **“Regional MRF and Landfill”** model is recommended due to both economies of scale and scope benefits; and

ii. A **"Regional MRF, Landfill, and Residential Collections"** model was found to be feasible, but requires further detailed review by each municipality based on individual objectives and preferences.

3. **Evaluate Change Impact for each Municipality:** Based on the desired service delivery model, each municipality needs to also evaluate its impact on the remaining waste management services and resources within each municipality. This needs to include existing waste collection functions, recycling / drop-off depots, transfer stations, and public education / communications activities.

4. **Review and Confirm Governance Structure:** Based on a confirmed "to-be" regional service delivery model, the member municipalities must then collaborate to review and confirm the **"Enhanced FRSC Mandate"** as the desired governance structure.

5. **Organizational Transformation:** Based on confirming the Foothills Regional Services Commission as the desired "to-be" governance structure, the region must then plan for its required organizational transformation and introduction of recyclables services. This requires a business plan which needs to consider changes to FRSC's internal capabilities required, management structure, net new resourcing and budget requirements, internal operating model, and implementation steps.

2.0 Project Overview

In June 2015, Stack'd Consulting Inc. was engaged by Tetra Tech EBA to perform a governance review for a proposed Regional Waste Management Entity. At central to this study was an assessment of a potential new regional Materials Recycling Facility (MRF). However, the study also extended to consider an entity which could manage the region's collections, processing, and disposal system. This section provides an introduction to and overview of this project.

2.1 Governance Review Objectives

As per the original Request for Proposal # 440-04-16, the requirement for the governance development work is noted as:

- *Recommend a governance structure to operate a Regional Waste Management Collection program and Materials Recycling Facility and determine whether it is best to be operated under the existing Foothills Regional Services Commission or operate independently as a business entity.*

Accordingly, this project served to analyze two unique properties for the potential Regional Waste Management System:

1. Analyze and recommend a future service delivery model for the Regional Waste Management System; and
2. Based on this recommended service delivery model, develop a recommended governance structure.

2.2 Governance Review Approach

To develop an appropriate governance structure, our project team engaged relevant representatives from each member of the Foothills Regional Services Commission. This was completed to understand the applicable objectives, governance priorities, and issues which require consideration for the proposed Regional Waste Management Collections / MRF Program. This also enabled the team to identify not only holistic, regional objectives and desired outcomes, but also the individual preferences and capacity for each member.

Part of this input was focused on the desired waste management service delivery model for the region. Although the primary focus of this project has been on determining the feasibility of a regional MRF, consideration has also been on whether a regional entity could also assume responsibilities for (1); the existing landfill, and (2); curbside collection services for residents within the region. Determining an appropriate governance structure is dependent on first confirming the desired mandate for such a regional entity and its "to-be" scope of waste management services.

Based on this input and an understanding of the priority selection criteria, an evaluation of the (1) existing Commission and (2) Independent Business Entity was conducted. From this, a final recommendation for the preferred governance structure was developed. This recommendation was described within this report, with the purposes of reviewing with municipal representatives from across the region and updating based on feedback received.

3.0 Regional Stakeholder Engagement

This section summarizes the input received during interviews with select interviews from each member municipality of the Foothills Regional Services Commission. It is focused on key themes of input in regard to the proposed Regional Waste Management System and desired characteristics of a governance structure.

3.1 Stakeholder Input

A review of the Phase 1 report was conducted with select representatives from each municipality within the region. During this review, the representatives were interviewed in regard to their perspective on the potential regional MRF facility, regional waste management activities, and an optimum governance model which their municipality would prefer. This section summarizes the key themes noted during these stakeholder interviews.

1. **Interest in Waste Diversion Services:** Each municipality noted that they had established priorities to achieve positive environmental outcomes for their respective community. With these priorities in mind, each community expressed an interest in introducing additional waste diversion services, particularly for recycling. Further, several of the municipalities have previously undertaken their own reviews to determine operational solutions to introduce and administer curbside recycling collections and processing services for their residents.
2. **Priority to Achieve Cost Efficiencies and Value for Money:** When considering potential desired outcomes for new waste diversion services and the potential for a regional service delivery model, each municipality noted a top priority to ensure an efficient service delivery model as possible. To that end, each municipality can appreciate that a regional MRF and curbside recycling collection services would represent net-new operational costs. However, each noted the importance for these services to exhibit high levels of value-for-money and to be organized to provide both operating and capital efficiencies.
3. **Regional Cooperation:** A general culture of willingness to cooperate with other municipalities within the Foothills region was also noted during discussions with municipal representatives. This was particularly reinforced by each municipality with the prospect of partnering with its regional neighbors if the primary benefit was receiving new waste diversion services and achieving cost efficiencies from economies of scale.
4. **Positive View of Foothills Regional Services Commission:** The Foothills Regional Services Commission is also generally viewed in a positive manner and as an example of a successful partnership model between the region's municipalities. Each municipality noted the importance of being a member of the Commission and, generally, there was satisfaction with having an elected official from each municipality serving on the Commission's board. It is also viewed as providing an effective service for the region.
5. **Single Regional Waste Management Entity:** When discussing governance structure alternatives for overseeing the region's various waste management activities (i.e. landfill, MRF, and / or residential collections), each municipality expressed a preference to establish only a single entity. To be more specific, it is not desired to have a separate regional MRF and collections entity apart from the existing Foothills Regional Services Commission. Preferences are to either enhance the mandate of the Foothills Regional Services Commission or to re-establish a new, single business entity.
6. **Ensure Sufficient Management & Technical Expertise:** It was also that such a single regional waste management needs to have sufficient management capabilities and technical expertise commensurate with its mandate and scope of responsibilities.

3.2 Desired Characteristics of a "To-Be" Governance Model

Based on the desired objectives of the proposed Regional Waste Management System and input from the regional stakeholders, a priority list of desired characteristics for a governance model was developed. These priority characteristics are described below:

Characteristic	Description
Efficiency	Degree to which the alternative supports the generation of appropriate cost savings across the region (i.e. for each municipality). Also, the recommended governance model must be committed to and able to demonstrate value for money.
Accountable for Service Delivery	Degree to which the alternative is accountable for service delivery and responsive to municipal expectations for customer service.
Sufficient Management & Technical Capabilities	Degree to which the alternative can deliver a sufficiently appropriate level of managerial capabilities and technical expertise given the mandate, scope of responsibilities, and complexity of the "to-be" regional waste management organization.
Regional Support	Degree to which the alternative receives buy in from member municipalities and stakeholders of the region. While the model has to support a holistic and inclusive approach to waste management service delivery, it also has to respond to individual municipal service level expectations.

The objective for using these criteria was to consider how well aligned each of the potential governance structure alternatives are against them. This was accomplished by noting applicable factors for each option against each individual criterion. The output from this analysis was the identification of the best suited alternative.

4.0 Service Delivery Model Alternatives

This section briefly describes the different potential service delivery models for the “to-be” Regional Waste Management Organization.

4.1 Regional MRF

The core of this project is the development of a concept for a Regional MRF. In this service delivery scenario, a “To-Be” Regional Waste Management Entity would be responsible for the establishment and operation of a MRF which could serve the anticipated recyclable volumes from across the region. Its focus would only be on the regional MRF processing operations, and would not include the regional landfill nor any residential collections activities. As such, each municipality would be responsible for its individual collections and hauling activities to the Regional MRF.

From discussions with representatives from each municipality, this is not a preferred alternative due to the following reasons:

- It does not provide any additional operating efficiencies from the existing waste management system;
- It potentially pits the new “To-Be” Regional MRF with the existing Foothills Regional Services Commission in a competition for regional waste stream volumes instead of managing it in a holistic manner.

4.2 Regional MRF and Landfill

In this 2nd service delivery scenario, a “To-Be” Regional Waste Management Entity would be responsible for the establishment and operation of a MRF while also assuming responsibilities for the regional landfill. However, it still would not assume responsibility for any residential collections activities. As such, each municipality would be responsible for its individual collections and hauling activities to the Regional MRF.

This service delivery model offers an advantage over the first model in that it would provide a single entity which would be able to holistically manage the processing of the region’s waste streams. As a single entity, it would also seek to optimize operating efficiencies by avoiding duplicative administrative, managerial, and governance resources.

However, this alternative does present some questions. First, it does not look to optimize efficiencies for the region’s residential collection services, as each municipality would still be responsible for its own collections and hauling activities. As well, this alternative would represent a distinct increase in both operational scope and required capabilities for the existing Foothills Regional Services Commission. As such, organizational transformation efforts would be required to ensure that the new “To-Be” entity would be commensurate with its enhanced mandate. This would include ensuring that both the landfill and MRF would have sufficient management capabilities in place for their operational and financial oversight.

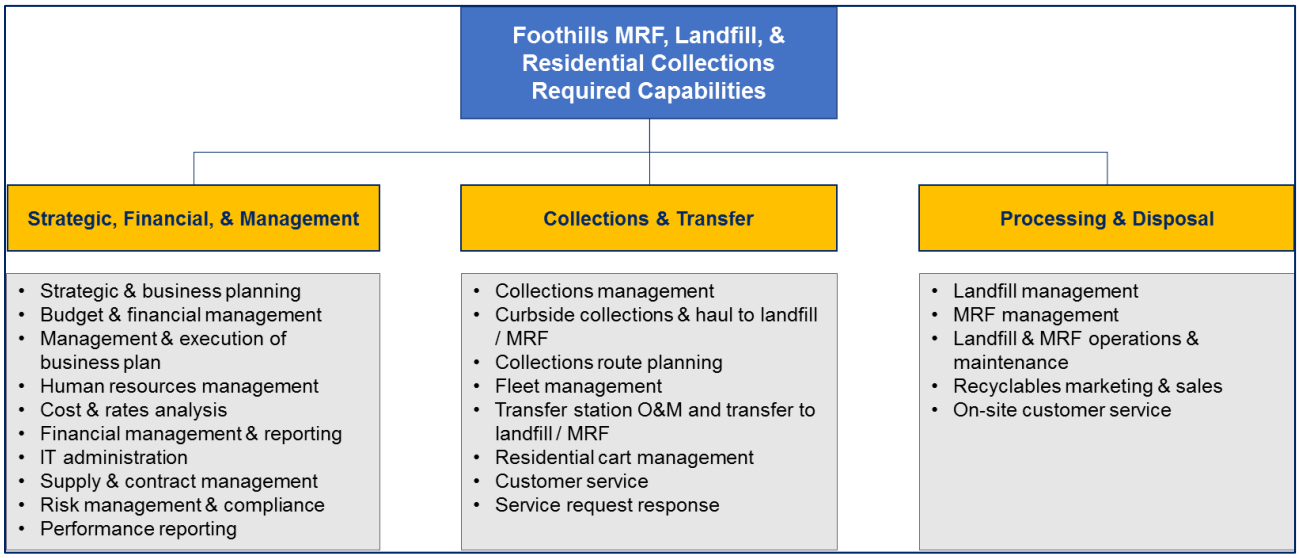
4.3 Regional MRF, Landfill, and Residential Collections

In this 3rd service delivery scenario, a “To-Be” Regional Waste Management Entity would be responsible for the not only for the MRF and landfill, but also residential collections and transfer activities for each municipality. The primary objective for this alternative would be to achieve further operating efficiencies through economies of scale.

Each municipality engaged expressed an interest in this alternative, provided that it could deliver operating efficiencies relative to each municipality providing its own residential collections for both waste and recyclables. However, the following concerns with this alternative included the following:

- The entity would need to be accountable for the delivery of customer service levels commensurate with each municipality's expectations (including responding to customer complaints and service requests);
- It would require more significant organizational transformation of the existing Foothills Regional Services Commission if its mandate was enhanced to assume responsibilities for the MRF and regional collection services; and
- It would need to provide transparent cost reporting to ensure that there would be no cross subsidization between municipalities.

Based on the mandate for this service deliver model alternative, the following list of "to-be" capabilities have been identified:



Note: the above hierarchy of capabilities does not necessary imply organizational design. Its purpose is to identify and categorize the necessary organizational capabilities required to execute its intended mandate. A "to-be" organizational design for this potential organization can then be developed based on confirmation of these capabilities.

Through discussions with individual municipalities, it is acknowledged there are some existing collections assets and resources which could be donated to this new regional entity should it be selected. However, due to several contracts many municipalities have already established for residential collections over the next few years, the timing for the introduction of these services would need to be planned to avoid unnecessary duplication of resources or risk to existing customer service levels.

Based on the mutual interest of the participating municipalities to drive increased waste diversion and forecasted costs for a regional waste management collections systems (as developed by Tetra Tech), it is recommended that the region pursue a service delivery model which can holistically manage not only the landfill and MRF, but also the residential waste collection activities for each participating municipality.

5.0 Governance Alternatives

Based on the priority characteristics of a desired governance model, four unique alternatives were identified. These alternatives are described in the sections below:

5.1 New, Separate Entity vs. Foothills Regional Services Commission

This alternative would create a new and distinct entity relative to the existing Foothills Regional Services Commission. The purpose of this entity would be to manage and oversee the new MRF and potential residential collections activities across the region. It would not include the landfill in this scenario.

In discussions with representatives from each participating municipality, this was not a desired option. As noted previously in Section 4.1, it creates duplication, doesn't effectively pursue regional cost synergies, and doesn't holistically manage the region's waste stream.

5.2 Enhance Mandate of Foothills Regional Services Commission

This alternative would take the existing Foothills Regional Services Commission and enhance its mandate to accommodate the increased scope of activities and responsibilities for the regional MRF and (potentially) residential collections. Direction from the Province of Alberta Municipal Affairs is that it is allowable for regional waste commissions to exist with such an expanded mandate (i.e. assume responsibility for collections, MRF processing, and landfill disposal as these are individual activities which combine to help manage the region's waste stream).

Increasing this mandate would require approval from each member municipality, however, in accordance with the Commission's policy framework.

As a Commission, the entity's board would continue to be formed by elected officials from each member municipality. Commissions are separate legal entities set up by two or more municipalities, First Nations Reserves, Métis Settlements, and armed forces bases that provide services on a regional basis to clients within (and outside with Minister's approval) the members' boundaries. They have their own distinct legal status separate from member municipalities. As a result, they can borrow and incur debt servicing costs (accessible through the Alberta Capital Finance Authority), directly expropriate land, and assume liabilities separate from member municipalities.

The overarching purpose of Regional Commission is to provide municipal services across the region at the lowest possible cost. It is not eligible to distribute any net operating profits back to member municipalities, but can manage its earnings to put towards future capital and / or operating requirements.

A potential drawback to this alternative was noted that the board is only comprised of elected officials and not industry or professional / technical experts (which corporate governance boards can benefit from). Depending on the added complexity and responsibilities of the "to-be" organization, it should supplement itself with priority expertise in the form of board advisor(s) and / or management team capabilities.

5.3 Municipal Controlled Corporation

Municipal controlled corporations are for-profit corporations that are controlled by a municipality or group of municipalities for the purposes of providing a regional municipal service or facility. As such, it would serve as a separate legal entity, which will allow it to directly employ staff, own assets, and raise financing

independent of the County. As per the Chartered Accountants of Canada Accounting Handbook[1] section 1300.28, the following characteristics apply:

a) it is a separate legal entity with the power to contract in its own name and that can sue and be sued;

b) it has been delegated the financial and operational authority to carry on a business;

c) it sells goods and services to individuals and organizations outside of the government reporting entity as its principal activity; and

d) it can, in the normal course of its operations, maintain its operations and meet its liabilities from revenues received from sources outside of the government reporting entity.

Municipal controlled corporations require the approval of the Minister of Municipal Affairs. It must demonstrate financial viability through three-year business plan. The intention is to be "for-profit", but at minimum must prove ongoing financial sustainability (i.e. no support from member municipalities). Municipal controlled corporations are regulated by the Municipal Government Act, Business Corporations Act, Control of Corporations Regulation, and the Debt Limit Regulation.

An added benefit of a controlled corporation is that the board can be comprised of industry and professional / technical experts (and blended with elected officials should the municipalities desire this). However, this obviously comes at an added administrative and overhead cost to the organization. However, should the organization be directed to operate on a for-profit basis, it can distribute dividends back to its municipal owners.

5.4 Part 9 Company (Not for Profit)

A Part 9 company must apply its profits in the pursuit of its stated objectives and no dividend should be paid to its members. Part 9 companies are regulated by the Companies Act. A Part 9 company may borrow funds for carrying out its objects, but is not eligible for direct loans from the Alberta Capital Finance Authority.

A Part 9 Company's board is typically selected based on desired competency and local community representation. As such, it is similar to a municipal controlled corporation in its ability to have industry and professional / technical experts on its board.

In communities where there is a desire to support local private industries (e.g. oil field services), this alternative can be effective in its responsiveness to the private sector (as it is a separate legal entity apart from its municipal owners) while committing to a not-for-profit status. If a dividend or return on investment is not required, then communicating to residents that waste management services will not include a profit component can be effective to gain buy-in. However, a Part 9 Company must produce financial reporting to meet requirements of the Companies Act to ensure it can retain its status as a registered not-for-profit organization.

[1] The Canadian Institute of Chartered Accountants, "Summary document for controlled entities; Appendix B; CICA PSAB Handbook excerpt", http://www2.gnb.ca/content/dam/gnb/Departments/lg-gl/pdf/PSAB-CCSP/CICA-PSABHandbookExcerpt.pdf, accessed April 2015

5.5 Evaluation of Alternatives

Based on the priority selection criteria, each plausible alternative has been evaluated on a relative basis. The table below summarizes how the plausible alternatives compare to one another:

Criteria	New Separate Entity	Enhanced FRSC Mandate	Municipal Controlled Corporation	Part 9 Company	Evaluative Comments
Efficiency	3	1	2	2	▪ Given mandate to demonstrate lowest possible costs for residential customers within the region, Commission is more stream-lined structure ▪ Commission mandate to specifically focus on pursuit of operational efficiencies and demonstration of value-for-money ▪ If focus shifts to providing more services to ICI or out-of-region customers, then Controlled Corporation becomes more advantageous
Accountable for Service Delivery	3	1	2	2	▪ Municipal Controlled Corporation and Part 9 Company are further arms-at-length structures from municipal shareholders ▪ Elected officials able to bring their local perspectives and priorities to ensure alignment with municipal needs
Sufficient Management & Technical Capabilities	TBD	2	1	1	▪ Both Municipal Controlled Corporation & Part 9 Company can have industry experts on the Board ▪ Commission can hire advisor(s) to assist Board on specific matters and needs to ensure appropriate management team competencies
Regional Support	3	1	2	3	▪ Input from municipal stakeholders is that current Commission model works well for the region and is reflective of desire to collaborate and directly share in governance function

Given the evaluation summary above, it is noted that enhancing the mandate of the existing Foothills Regional Services Commission is a preferred alternative in regard to Efficiency (based on intended mandate), Accountability for Service Delivery, and Regional Support. Both the Municipal Controlled Corporation and Part 9 Company are superior to ensuring that sufficient management and technical capabilities are developed to guide the organization and serve its municipal shareholders.

However, it is possible for the Regional Commission to acquire industry / technical expertise to help guide its future operations. Given its increased scope of responsibilities, it would be prudent to transform the entity's management team to ensure sufficient strategic, financial, and operational management capabilities. These would be required to ensure it remains accountable to the demands of the region and its evolving waste management needs and opportunities. In addition, it is possible for the Board to hire an industry / technical advisor(s) to advise on specific operational, technical, and / or other organizational management considerations.

Creating a new, separate entity was not viewed as desirable, given that it would create duplication and potentially juxtapose the existing Foothills Regional Services Commission in a competition for tonnes.

6.0 Recommendations

Based on the analysis performed on a preferred “to-be” Service Delivery Model and Governance Structure, the following recommendations are provided:

1. **Approve Regional Recyclables Program:** Based on the technical and costing analysis performed through this project, each municipality first needs to validate and approve its intentions to:
    iii. Implement residential recyclables waste diversion services within its community (particularly for those who current do not have curbside recyclables collections); and
    iv. Utilize the proposed regional MRF as concepted through this project.
2. **Service Delivery Model:** Each member municipality within the Foothills Regional Services Commission needs to also review and confirm its preference for a “to-be” regional service delivery model:
    iii. At a minimum, a **“Regional MRF and Landfill”** model is recommended due to both economies of scale and scope benefits; and
    iv. A **“Regional MRF, Landfill, and Residential Collections”** model was found to be feasible, but requires further detailed review by each municipality based on individual objectives and preferences.
3. **Evaluate Change Impact for each Municipality:** Based on the desired service delivery model, each municipality needs to also evaluate its impact on the remaining waste management services and resources within each municipality. This needs to include existing waste collection functions, recycling / drop-off depots, transfer stations, and public education / communications activities.
4. **Review and Confirm Governance Structure:** Based on a confirmed “to-be” regional service delivery model, the member municipalities must then collaborate to review and confirm the **“Enhanced FRSC Mandate”** as the desired governance structure.
5. **Organizational Transformation:** Based on confirming the Foothills Regional Services Commission as the desired “to-be” governance structure, the region must then plan for its required organizational transformation and introduction of recyclables services. This requires a business plan which needs to consider changes to FRSC’s internal capabilities required, management structure, net new resourcing and budget requirements, internal operating model, and implementation steps.