S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

Township of Emo

# Class B Environmental Assessment For

# The Emo Recycling Centre

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August 2011

## Executive Summary

### Background

The Township of Emo retained S. Burnett & Associates Ltd (SBA) to provide engineering and environmental services to complete the following document, based on the proposal date April 19th, 2011, which reports a Class Environmental Assessment (Class EA) for a proposed Recycling Centre for the Township of Emo. This report has been prepared in accordance with Municipal Class Environmental Assessment (Municipal Engineers Association, 2007), an approval under the Ontario Environmental Assessment Act for municipal infrastructure.

The purpose of the assessment is to determine the best solution for their recycling issues. The project is funded by the municipality of Emo.

### Recycling

The purpose of a Recycling Centre is to generate revenue from containers of used goods, by reusing and recycling the products. Recyclable goods are sorted and broken down into materials that can be used to create new items all together.

Municipal recycling programs implemented within the province of Ontario, are subject to the standards outlined in the Ontario Waste Diversion Act, 2002. This act outlines the guidelines and regulations a municipality should follow in order to divert waste. The diversion of waste that can be recycled, is beneficial to the environment on many levels, but most importantly in this case, a municipality can extend the life of its landfill.

### Extending the life of the Landfill

By following the Ontario Waste Diversion Act, recycling programs encourage the extension of the life of Municipal landfills. If all goods that are now being recycled went directly into a landfill, the maximum capacity of that landfill will be reached much quicker.

Extending the life of a landfill is important to a community because when the landfill reaches its maximum capacity, a new landfill will need to be developed. Developing a new landfill is very costly for the tax payers of a municipality, whom would be the main source of funding.

### Proposed Alternatives

Alternative solutions to the problem/opportunity statement identified and comparatively evaluated were; do nothing, continue with the current recycling program, build a Recycling depot beside the Cloverleaf Grocery and Construct a Recycling Centre at the Emo Municipal Garage.

For the purposes of the Assessment, each alternative solution was subject to an evaluation in relation to their advantages and disadvantages under the criteria of environmental impact, social impact, technical considerations and economic feasibility. This was completed to assist with quantifying each alternative for each of the criteria within the evaluation matrix.

Based on the results from the evaluation matrix, as well as the Town's input, it was determined that constructing a Recycling Centre at the Emo Municipal Garage is the preferred solution. In order to verify this result, analysis was performed with the evaluation matrix, which verified that Alternative 4: Constructing a Recycling Centre at the Emo Municipal Garage is the preferred alternative.

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## 1.0 Introduction and Background

This report documents the Environmental Assessment completed for a new Recycling Centre for the Township of Emo. This report has been prepared in accordance with Municipal Class Environmental Assessment standards, as required for approval under the Ontario Assessment Act for Municipal infrastructure projects. The Recycling Centre development project was initiated in March of 2011. S. Burnett & Associates Limited (SBA) was retained as the lead consultant for this project following a Motion of Town Council on April 19th, 2011.

### *1.1 Project Background*

The Township of Emo is located along the Rainy River, approximately 30 kilometres west of Fort Frances. The Town of Emo, with an estimated 1,305 residents (2006 Census), is becoming increasingly environmentally conscious and have established a local recycling program. The program currently consists of communal recycling bins, located at the Emo Municipal Garage, where residents can drop-off their recyclable waste. Communal recycling bins are designated for Aluminum cans, paper, #1 and #2 plastics and a mix of #3 to #7 plastics. Cardboard is also collected and taken to the local grocery store for bundling.

Although the existing recycling program is effectively diverting recyclables from the municipal landfill, the program is not meeting the needs of the community. The existing communal bins do not provide adequate storage capacity and the frequency of the pickups is insufficient. This results in an overflow of the communal recycling bins between scheduled pick-ups. Due to the fact that existing recycling program is not meeting the needs of the community, the Township of Emo requires a new strategy in order to continue diverting recyclables from the local landfill.

### *1.2 Previous Studies*

Several previously completed studies are applicable and relevant to the Township of Emo's Recycling Centre site development project, including:

> -*Emo Landfill: Economic Assessment.* Prepared by: R.J. Burnside and Associates Limited, November 2003.
> -*Emo Landfill Site: Closure and Post Closure Liability Assessment*. Prepared by: K. Smart Associates Limited, January 14, 2009.

"*The Emo Landfill Site: Closure and Post Closure Liability Assessment*" report reviewed the 2003 assessment completed by R.J. Burnside and asserts that the existing landfill has a remaining lifespan of 16 year, based on the remaining capacity and assuming a consistent waste generation rate. This study has been attached and can be viewed in Appendix A.

### *1.3 History of Issues that Led to the Development of the Problem Statement*

In the early 2000's, the Town of Emo was becoming increasingly concerned with the amount of waste produced by Emo residents. Likewise, the community was becoming concerned with the rate at which the township's landfill was being filled, and the implications of new provincial legislation restricting what can be disposed of in landfills. The environmental and economic

costs associated with these concerns prompted the municipality to accelerate its recycling programs.

The response from residents has been largely positive, and an increasing amount of recyclable waste is being effectively diverted from the landfill. However, the amount of recyclables generated from Emo residents does not warrant a weekly curb-side pick-up service. For that reason, residents must bring their recyclables to the communal recycling bins located at the Emo Municipal Garage. Unfortunately, the Municipal Garage and the recycling bins do not offer the storage capacity needed to prevent the bins from overflowing between weekly scheduled pick-ups.

The current recycling program is not meeting the needs of the community, and thus the Town must implement a new strategy to satisfy the community's desire to divert waste and extend the life of the Municipal Landfill. The development of a Recycling Centre would encourage Emo residents to continue recycling, and would allow the municipality to extend the use of the landfill.

### *1.3.1 Recycling Centres*

The purpose of a Recycling Centre is to generate revenue from containers of used goods, by reusing and recycling the products. Recyclable goods are sorted and broken down into materials that can be used to create other containers, or create new items all together. For example, # 1 plastics, once recycled, can be broken down into the material used for polar fleece. This illustrates the importance of the value in recycled goods.

Municipal recycling programs implemented within the province of Ontario, are subject to the standards outlined in the Ontario Waste Diversion Act, 2002. This act outlines the guidelines and regulations a municipality should follow in order to divert waste. The diversion of waste that can be recycled, is beneficial to the environment on many levels. One being that the energy and revenue required to produce new raw materials to create a recyclable can be reduced, by recycling goods. Secondly, by recycling a municipality can extend the life of its landfill.

### *1.3.2 Extending the Life of a Landfill*

By following the Ontario Waste Diversion Act, recycling programs encourage the extension of the life of Municipal landfills. If all goods that are now being recycled went directly into a landfill, the capacity of that said landfill will reach its maximum capacity much quicker.

Extending the life of a landfill is important to a community because when the landfill reaches its maximum capacity, a new landfill will need to be developed. Developing a new landfill is very costly for the tax payers of a municipality, whom would be the main source of funding.

## *1.4 Description of the Class Environmental Assessment Planning Process*

The Recycling Center site development project is subject to the Province of Ontario's Environmental Assessment (EA) Act. The Class Environmental Assessment process is an approved process under the EA Act for a specific "Class" of projects. Projects are approved subject to compliance with an approved Class EA process.

The Town of Emo is the proponent for this study. As a municipality, the Town is required to follow the process outlined under the Municipal Class Environmental Assessment document which was approved on October 4, 2000 and amended on September 6, 2007.

### *1.4.1 Three Project Classifications / Class EA Schedules*

The Class EA classifies the projects into three "schedules" according to their environmental significance:

- **Schedule 'A'** projects are limited in scale, have minimal adverse effects and include the majority of municipal maintenance and operational activities. These projects are approved and may proceed directly to implementation without following the other phases.

- **Schedule 'B'** projects have the potential for some adverse environmental effects. The municipality is required to undertake a screening process (Phases One and Two) involving mandatory contact with directly affected public and relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. Schedule 'B' projects require that a report be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to implementation.

- **Schedule 'C'** projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA Document (Phases One to Four). Schedule 'C' projects require that an Environmental Study Report (ESR) be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to implementation.

### *1.4.2 Schedule 'B' Classification*

Since the preferred solution involves the construction and extension to the building at the Municipal Garage, it is classified as a Schedule 'B' project. Therefore, the following Class EA Phases were carried out for this study:

**Phase One: Identify the Problem / Opportunity**

This phase involves not only identifying the problem / opportunity, but also describing it in sufficient detail to lead to a clear problem / opportunity statement.

**Phase Two: Identify and Evaluate Alternative Solutions to the Problem / Opportunity**

This phase involves six steps: (1) identify reasonable alternative solutions to the problem/opportunity; (2) prepare a general inventory of the existing natural, social and economic environments in which the project is to occur; (3) identify the net positive and negative effects of each alternative solution including mitigating measures; (4) evaluate the alternative solutions; (5) consult with review agencies and the public to solicit comment and input; and (6) select or confirm the preferred solution.

Since the project was identified as a Schedule "B" project, Phase 3 and Phase 4 are not required for the completion of the EA study. Once the EA is review and considered complete,

the project can move to Phase 5 which is implementation phase. The following is summary of the additional phases for the completion of a Schedule "C" project.

**Phase Three: Identification / Evaluation of the Design Alternatives for Implementing the Preferred Solution**

This phase also involves six steps: (1) identify alternative design concepts for implementing the preferred solution; (2) prepare a detailed inventory of the existing natural, social and economic environments; (3) identify the net positive and negative effects of each alternative design concept including mitigating measures; (4) evaluate the alternative design concepts; (5) consult with review agencies and the public to solicit comment and input; and (6) select or confirm the preferred design concept.

**Phase Four: Preparation of the Environmental Study Report (ESR)**

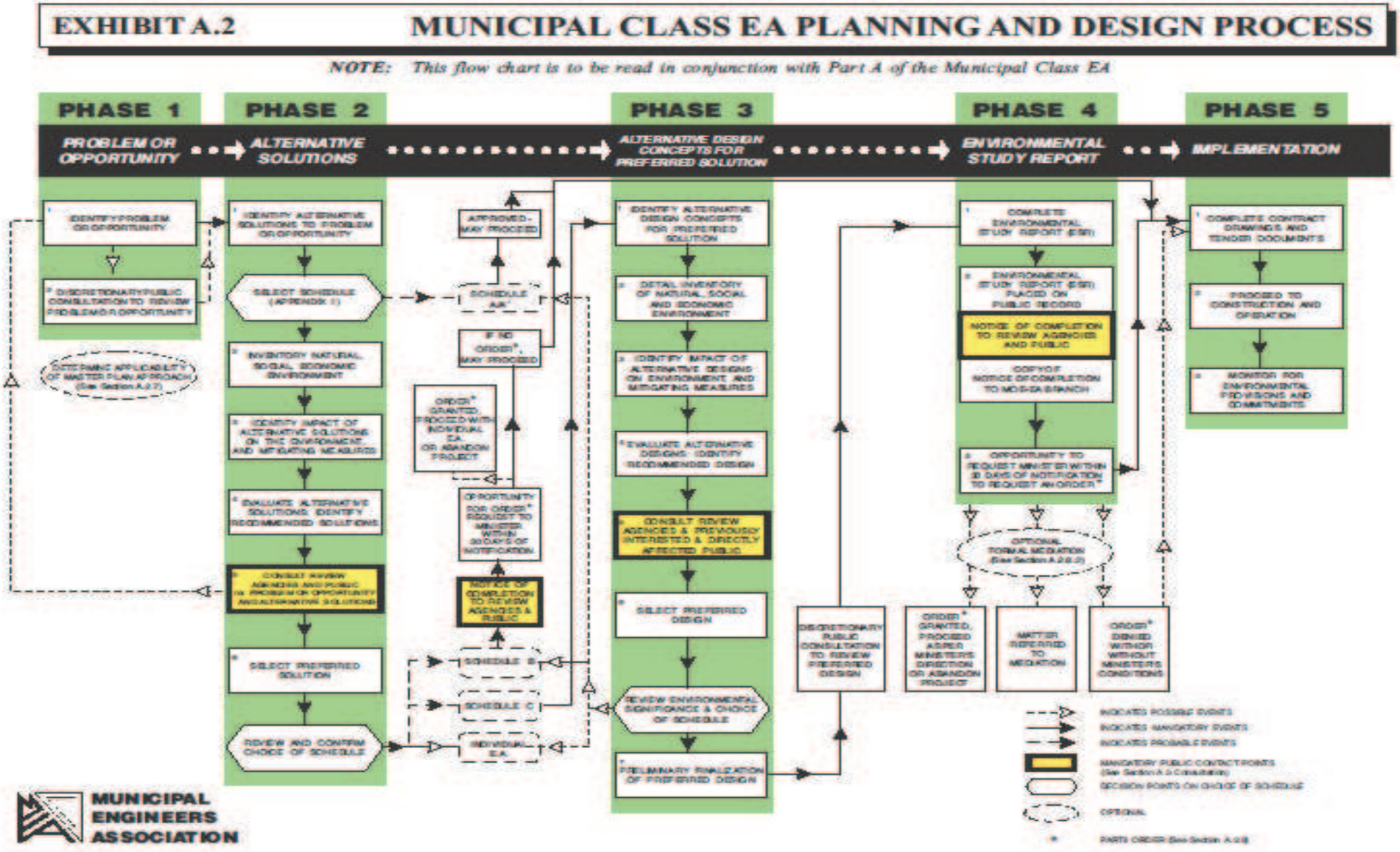
This phase involves the documentation of the three preceding phases in an ESR for review by review agencies and the public. Once completed, the ESR is placed on public record for a period of at least 30 calendar days to allow review agencies and the public an opportunity to review it.

**Phase Five: Implementation**

This Phase involves completing drawings and design of the preferred solution. It also incorporating any mitigating measures identified during the process. Any monitoring programs identified during the process shall be undertaken to ensure that the environmental provisions and commitments made during the process are fulfilled and effective.

Due to the interest in this study expressed by the residents during the initial public meetings for the Recycling Centre in the Town of Emo, the consultation program was an important component of the Environmental Assessment Study. In addition to the Notice of Study Commencement, two (2) formal Public Information Centers were held in the community to share progress and solicit feedback on study findings and recommendations. Figure 1 illustrates the five phase Municipal Class EA processes followed for this project.

Figure 1: Environmental Assessment Planning and Design Process



## 2.0 Problem Statement

### *2.1 Description of the Purpose of the Project*

The Town of Emo, which has approximately 1,305 residents, has established a local recycling program. The program consists of communal recycling bins, located at the Emo Municipal Garage, where residents can drop-off their recyclable waste. Communal recycling bins are designated for Aluminum cans, paper, #1 and #2 plastics and a mix of #3 to #7 plastics. Cardboard is also collected and taken to the local grocery store for bundling. This current program cannot keep up with the demand presented by the community.

In finding a solution to the Town's recycling issue the development of a new recycling centre was presented. With this project, an evaluation of a potential location is needed to suit such a centre. This Recycling Centre would include more recyclable goods that can be diverted from the landfill waste. The project would also have to evaluate the construction of a more efficient and more easily managed recycling program. In this, the creation of a drop location and area for a higher recyclable goods capacity must be addressed. Another thing to consider is arranging a recycling conglomerate and/or source for disposal of the recycled goods designated for the recyclable pick-up.

This study will complete a Schedule "B" Municipal Class Environmental Assessment for the recycling center to meet all requirements of the Municipal Class Environmental Assessment (Class EA) process (MEA 2007).

### *2.2 Agency and Stakeholder Consultation*

Opportunities have been offered to the public, stakeholders and regulatory agencies to provide input on the development of the Problem Statement, development and evaluation of alternatives and on the selection of the components of the preferred alternative for the Strategy. The process included a Steering Committee meeting, Council and project team meetings as well as two (2) Public Information Centres (PIC).

#### *2.2.1 Public Information Centre 1*

The Public Information Centres (PIC) were conducted in an open house format. The first PIC took place on March 30, 2011 from 5 to 8 p.m. in the Emo La Vallee Community Centre. The PIC was advertised twice in the local newspaper to encourage local and surrounding area residents to attend. This PIC introduced the concept to the public and reviewed the problem statement and possible alternatives. This session informed the public on how the town could utilize a recycling center and the program brought to light at the PIC.

Based on the sign-in sheet 22 community members attended this meeting. The public notice, sign in sheet, poster boards and comments from the March 30$^{th}$ PIC are provided in Appendix B. To summarize the feedback provided by the community, many residents regarded the recycling idea as "great" and "excellent". The results of the PIC were very positive with majority of the attendees' very supportive of the project.

### *2.2.2 Public Information Centre 2*

The second PIC, which was held on July 11th, 2011, presented changes which were suggested to the original recycling centre. SBA and the project team attended the meeting to answer any questions that were not answered by the 14 informational boards which were posted on the walls of the Emo La Vallee Community Centre. The boards were 2'X3' in size and contained information on the project such as; background information, the EA process, the potential alternatives and the next steps in the process. Specifically, 2 of the 14 boards provided details on the advantages and disadvantages for each of the proposed alternatives.

Based on the sign-in sheet the PIC meeting was attended by 29 community members and project team members. Attached in Appendix C is the sign in sheets, the comment sheets from the PIC and the boards that were presented at the PIC.

### *2.3 Development of Problem Statement as a Result of Consultation Process*

Through the consultation process, the Project Team, in collaboration with the Project Steering Committee, developed the following Problem Statement:

"The Township of Emo's current recycling program does not provide adequate storage and pick-up to meet their current demand. With little space and stockpiling of recycled goods between pick-ups, the town needs to implement a plan in order to satisfy the communities desire to divert waste. As well as diverting recyclable goods from occupying valuable space within the local landfill, a waste diversion program will extend the life of the existing landfill. To address the issue, the development of a recycling centre will continue to encourage Emo's residents to recycle, as well as satisfying to the current demand and to meet future recycling needs."

## 3.0 Description of the Existing Environment

### *3.1 Natural Environment*

#### 3.1.1 Topography and Drainage

The Town of Emo is situated along the north shore of Rainy River, downstream of Fort Frances. The land surrounding the Town is relatively flat lying and is intersected by small tributaries of the river. The soils are generally clay, clay loam, and silt loam. Drainage in the area is imperfect to poor and gently sloping towards Rainy River. Emo township land use is primarily for agriculture to grow crops and the raising of livestock.

#### 3.1.2 Regional Conditions

Emo is located in north-western Ontario, sharing a river between Ontario and the Minnesota border. The majority of the area around Emo is underlain by glaciolacustrine coarse-grained deposits with recorded thicknesses of 30 to 60 metres. Bedrock in the area consists of rock of both the Quetico and Wabigoon provinces.

#### 3.1.3 Rainy River

Rainy River is approximately 137km (85 miles) long, which streams from the west side of the Rainy Lake and flows towards the west-northwest between Fort Frances and International Falls the River forms international border between Canada and United States, flowing westerly where it enters the southern end of Lake of the Woods approximately 19km (12 miles) northwest of Baudette. The drainage basin of the river stretches east to the height of land about 100 km west of Lake Superior, and drains through the Winnipeg River, Lake Winnipeg and the Nelson River into Hudson Bay.

Rainy River is home to Walleye, Northern Pike, Smallmouth Bass, Sturgeon and Muskies. It also provides many wildlife viewing opportunities including: Eagles, Deer, Beaver, Otter, and 200 other species of birds during migration. Rainy River is one of the few rivers to support a healthy population of large Sturgeon, plus a great Small-mouth Bass fishery.

#### 3.1.4 Climate

Located near the centre of North America, most of the region has a continental climate with warm to hot summers and cold winters. Spring and autumn tend to be short seasons sandwiched between some of the extremely cold weather of winter and warm summer. Lake Superior moderates some of the temperature extremes and some of the large lakes in the region add to winter snowfall and subtract from summer rain on a local basis.

#### 3.1.5 Aquatic Ecology

The types of fish species that may be found in the Rainy River are Northern Pike in the spring and summer, Walleye from spring through autumn and Small-mouth bass and Sauger from summer to autumn. Lake Sturgeon are identified as a Species at Risk in the Rainy River design table unit (DU6).

### *3.2 Economic Environment*

The Town of Emo established a business park to attract industry and business to Emo which will support the needs of Emo residents and surrounding communities. New businesses and industries have expressed interest in establishing themselves in Emo. Recently Emo was selected for the location of a new regional abattoir. The growth of business and industry increases the number of employment opportunities in the area and attracts new residents and provides incentives for existing residents to live in the area. These initiatives have had a very positive influence on the Township of Emo and the surrounding municipalities. These economic opportunities will also put more stress on the current recycling program.

### *3.3 Population and Land Use*

The Township of Emo has a population of appropriately 1305 people (2006 Census). The majority of the population base is within the Town of Emo boundaries.

### *3.4 Mitigation*

The increasing number of people in the Township of Emo each year can be categorized into two distinct groups. One group of people adding to the population are newborns. The second group, are people who migrate in or out of the Emo area. As new facilities develop and as new employment opportunities become available, the number of people wanting to move to Emo will continue to increase. The economic opportunities in the area including the new moving initiative are increasing this demand.

### *3.5 Historical Population*

The population of the Township based on the 2006 census was 1305. There were 507 dwellings in the Township at that time. This results in a housing density of 2.6 persons per household. Since 2006 there have been approximately 1 to 2 dwellings built per year.

The Township has also established a new business park to attract business and industry to the community. A new subdivision has also recently been approved which consists of 70 new single detached residential units. This additional growth will place additional demands on the current infrastructure and recycling program.

### *3.6 Recommended Average Annual Growth Rate (AAGR)*

The existing demographic profile was obtained from the 2006 Census. Table 3 illustrates the existing profile.

**Table 1: Existing Demographics of Emo Township**

| Existing Demographics of Emo Township | | | |
|---|---|---|---|
| Age characteristics | Total | Male | Female |
| Total Population | 1,305 | 635 | 670 |
| 0 to 4 | 85 | 40 | 45 |
| 5 to 9 | 95 | 45 | 45 |
| 10 to 14 | 100 | 55 | 50 |
| 15 to 19 | 100 | 55 | 45 |
| 20 to 24 | 65 | 30 | 30 |
| 25 to 29 | 60 | 30 | 30 |
| 30 to 34 | 80 | 35 | 45 |
| 35 to 39 | 75 | 40 | 35 |
| 40 to 44 | 110 | 55 | 55 |
| 45 to 49 | 100 | 45 | 60 |
| 50 to 54 | 80 | 55 | 35 |
| 55 to 59 | 80 | 35 | 40 |
| 60 to 64 | 50 | 20 | 25 |
| 65 to 69 | 50 | 20 | 25 |
| 70 to 74 | 50 | 25 | 30 |
| 75 to 79 | 40 | 25 | 20 |
| 80 to 84 | 35 | 10 | 25 |
| 85 + | 50 | 15 | 35 |
| Median age of the population | 39.9 | 38.4 | 41.4 |
| % of the population aged 15 and over | 78.2 | 77.2 | 79.9 |

*2006 Census*

Typical growth rates for communities in Northern Ontario are approximately 3%. For the projected population growth estimate of Emo for the next 20 years this growth rate will be adopted. Based on the growth rate the estimated population of the Township of Emo in 2030 will be 2403. It is recommended that the estimated population of 2403 people living in the Township of Emo, be used as the basis for comparing the capacity of the existing infrastructure to future demands.

**Table 2: Estimated Population Growth**

| Estimated Population Growth (3% Growth Rate) | | |
|---|---|---|
| | Number of Dwellings | Population |
| 2001 | | 1331 |
| 2006 | 509 | 1305 |
| 2010 | 519 | 1331 |
| 2015 | 602 | 1543 |
| 2020 | 697 | 1788 |
| 2025 | 809 | 2073 |
| 2030 | 937 | 2403 |

It is also important to note that these numbers include every resident throughout the entire township. Currently the Emo residents who live within the town have access to the current recycling program. Many residents that live outside of the town centre use the recycle bins available at the Landfill. The out of town residence are encouraged to use the available recycle program within the town centre and will continue to be encourage to use the recycling program when a preferred alternative is reached.

## 4.0 Alternative Identification

The alternative solutions to the problem/opportunity statement identified and comparatively evaluated are:

1) Do nothing
2) Continue with the Current Recycling Program
3) Building a Recycling Depot At the Cloverleaf Grocery Store
4) Construct a Recycling Centre at the Emo Municipal Garage

Alternative 1, Do Nothing, would cease any current recycling measures and limit all waste to be diverted into the landfill. There would be no recycling program of any kind and the town would not benefit from any revenue created from recycled goods.

Alternative 2; Continue with the Current Recycling Program, is used by the Town of Emo and consists of communal recycling bins where residents can drop-off their recyclable waste. The program is currently stationed at the Municipal Garage. The Communal recycling bins are designated for Aluminum cans, mixed paper, #1 and #2 plastics and a mix of #3 to #7 plastics. Cardboard is also collected and taken to the local grocery store for bundling. The current expense from this program is $12,696.00 annually.

Alternative 3, Build a Recycling Depot at the Cloverleaf Grocery Store, is based on constructing a recycling depot beside the existing Cloverleaf Grocery. Three used shipping containers would be purchased, that would be used for the separation of recycled goods. The town's people would drive into a proposed parking and turn around area, sort and separate recycled goods into the marked recycled containers. The depot was originally proposed to be located on private and public property, saddled between the Fairground and the Cloverleaf property line.

Alternative 4 is to construct a Recycling Centre at the Emo Municipal Garage. This alternative includes constructing an extension to the existing Municipal Garage building; and from there, a Recycling Centre can be created. The Recycling Centre will have 8 marked stalls for the separation of recyclable goods ranging from #1 plastics, #2 plastics, #3-#7 plastics, Tin cans, Aluminum cans, Glass bottles, Cardboard and a Non-sorted stall, for those residents that do not wish to sort their recyclable items

These alternatives are then evaluated throughout the Environmental Assessment report to determine the value each option has on an environmental, social, technical and economic impact has upon the Town of Emo and their ability to recycle. The alternatives are also discussed in further detail in section 6.0 of the report.

## 5.0 Criteria for Evaluation of Alternatives

The evaluation of the alternative solutions was carried out based on the following criteria:

- Environmental Impacts
- Social Impacts
- Technical Considerations
- Economic Feasibility

### *5.1 Environmental Impacts*

The evaluation of the alternatives for potential environmental impacts is based on the following criteria:

- Does it comply with Environmental Regulations?
- Are the environmental impacts known, or can they be predicted?
- Can the environmental impacts be mitigated?

### *5.2 Social Impact*

Social and general impacts include:

- The financial implications for residents
- Impacts on economic development opportunities and the local business community
- Impacts on land use and the urban structure
- Impacts on the quality of life in the immediate and surrounding communities
- The schedule for implementation of alternatives and disruption to the community
- The long term planning considerations

### *5.3 Technical Consideration*

The technical feasibility is the fundamental consideration in the assessment of alternative solutions. An alternative must first be technically feasible before it can be further evaluated. Technical feasibility is assessed on the basis that the undertaking can be carried out and that the technology involved has been proven. If the technology has not yet been proven, it must be shown that the risks associated with adopting the new technology can be accepted and that the technology meets operational accreditation requirements.

### *5.4 Economic Feasibility*

The economic impacts are assessed based on the following:

- The relative life cycle costs (capital and operation and maintenance costs)
- The economic sustainability of the alternative

## 6.0 Description of the Alternative Solutions

### *6.1 Alternative 1: Do Nothing*

The Class EA process requires that the 'do-nothing' alternative be considered. The 'Do Nothing' alternative acts as a comparative benchmark for all of the other alternatives. This alternative must consider the base condition and dismiss the current recycling program and consider that all the recyclable waste would be streamed directly to the landfill. There would be no recycling program of any kind and the town would not benefit from any revenue created from recycled goods. In fact, this alternative would likely result in a tax increase for the citizens in the township of Emo because collection of waste would have to increase, leading to more work on behalf of the Municipal Landfill.

### *6.2 Alternative 2: Continue With Current Recycling Program*

The current program that is used by the Town of Emo includes bins that are currently stationed at the Municipal Garage. The program consists of communal recycling bins where residents can drop-off their recyclable waste. Communal recycling bins are designated for Aluminum cans, mixed paper, #1 and #2 plastics and a mix of #3 to #7 plastics. Cardboard is also collected and taken to the local grocery store for bundling. The current expense from this program is $12,696.00 annually.

The problem that has presented itself to this program is that existing communal bins do not provide adequate storage capacity and the frequency of weekly pickups is insufficient. The overflow of bins also presents a problem from an environmental stand point, because the bins are located outdoors, as shown in Figure 2 and Figure 3. When weather of a strong nature passes over the community, the overflow may blow off into the surrounding environment. This creates waste that could be diverted, entering the environments.

**Figure 2: Current Recycling Program**

**Figure 3: Current Recycling Bins at Emo Municipal Garage**


The overflow of the bins has demonstrated that the town's program is currently diverting recyclables from the municipal landfill; but the program is not efficiently meeting the needs of the community.

### *6.3 Alternative 3: Build a Recycling Depot Beside the Cloverleaf Grocery Store*

This alternative was one of the options presented at the first PIC on March 30th, 2011. This alternative is based on constructing a recycling depot beside the existing Cloverleaf Grocery. This alternative was presented to the township by the owner of the Cloverleaf Grocery Store as a possible private/public relationship. This alternative would be run by the owners of the Cloverleaf grocery, as the depot was originally proposed to be located on private and public property, saddled between the Fairground and the Cloverleaf property line.

The logistic behind this alternative are as follows. Three used shipping containers would be purchased, that would be used for the separation of recycled goods. The town's people would drive into a proposed parking and turn around area, sort and separate recycled goods into the marked recycled containers. From there a Cloverleaf employee would use the compactor and baler provided by Cloverleaf Grocery store. The baled recycled goods would be stored on the shared Property line until there appointed pick-up.

This alternative encourages town residents to divert waste, but does not provide an alternative solution to those residents that use the Emo Landfill as their main source of waste disposal. Discussions with the Fairgrounds since the initial PIC have indicated that there are some concerns with the depot being placed on the Fairgrounds property. The option is a good example of private public opportunities. This alternative will not be municipally run, and therefore the residents would not have any input on how the recycling depot is run. There is also a possibility for recyclable entering into the environment because the depot will be operated fully outdoors.

### *6.4 Alternative 4: Construct a Recycling Centre at the Emo Municipal Garage*

Alternative 4 is to construct a Recycling Centre at the Emo Municipal Garage. This alternative includes constructing an extension to the existing Municipal Garage building; and from there, a Recycling Centre can be created. The Recycling Centre will have 8 marked stalls for the separation of recyclable goods ranging from #1 plastics, #2 plastics, #3-#7 plastics, Tin cans, Aluminum cans, Glass bottles, Cardboard and a Non-sorted stall, for those residents that do not wish to sort their recyclable items. This has been illustrated in the Draft Preliminary Design in Appendix E.

There will also be bins at the landfill for those out of town residents that choose to recycle when they are taking their waste to the Landfill. When these bins are full, they will be collected and transported to the Emo Municipal Garage to be baled and stored along with the other goods.

When the 8 stalls in the Recycling Centre reach capacity, a town employee will collect the sorted goods and transport them to the baler. From there, the employee will compact and bale the items and then stack the bales in the assigned storage area, until there are enough stacked goods ready for pick up. Pick-up will be scheduled as it is required, which is when the amount of recyclables will fill an entire truck load. The companies Cascades and Buildrite are within the surrounding regions of the Township of Emo that will collect and process recycled goods.

This alternative will be run directly by the town, which will allow for the town residents to have input on how the Center is run, as well as if they wish to integrate any improvements. Also the recycling centre will be enclosed within the walls of the building. This will be beneficial to the environment because recycled waste will have little ability to enter the environment from weather related elements. This Alternative will encourage the town to continue to divert waste and assist in extending the life of the local Landfill.

## 7.0 Capital Cost Estimates

### *7.1 Economic Analysis of Recycling Opportunities*

Based on the a study completed by the Seattle Public Utilities and prices provided by Cascades Inc., from Winnipeg and Buildrite, from Julie Minnesota, an estimate on the revenue each recyclable good will generate was calculated. Using this information an estimate on how many tonnes of the recyclable goods the Town of Emo would generate annually was also determined. From this analysis and sourcing out what company in the surrounding location would provide incentives for recycling, the estimate for the potential revenue that Town of Emo can generate from a recycling program was determined. This estimate indicates that the potential revenue from a recycling program could be approximately $2160.00, annually. The table in Appendix D represents the estimates and pricing provide by the local recycling companies for the Town of Emo.

### *7.2 Associated Capital Cost Estimate*

For each alternative, an associated capital cost estimate was determined based on the cost of the requires equipment, as well as the cost associated with the transportation of the recycled goods, and labour and materials needed for construction. An associated capital cost estimate can be generated. Breakdowns of the cost estimates for each alternative are illustrated in Table 3.

**Table 3: Economic Feasibility Estimates**

| Economic Feasibility Estimates | | | | |
|---|---|---|---|---|
| Alternative | Capital | O&M (annually) | Revenue (annually) | 30 Year Life Cycle |
| Do Nothing | 0 | $17,940 | 0 | $369,564 |
| Continue With Current Program | 0 | $12,696 | 0 | $264,216 |
| Recycling Depot at Cloverleaf Grocery | $28,392 | $12,696 | 0 | $289,942 |
| Recycling Centre at Emo Municipal Garage | $76,000 | $10,440 | $2,160 | $246,576 |

Table 3 describes the initial capital cost associated with material and labour required for constructing the design, as well as the equipment needed for each alternative. The O&M, also known as operation and maintenance costs are associated with the annual expenses of each alternative, including labour, hydro and transportation and shipping costs. The Revenue described in this table is the revenue that will be generated by the recycling program alternative.

It is imperative to note that there is a 30 year life cycle cost associated with each alterative. A life cycle cost analysis is used to make economic decisions for selection of building materials and design. This accounts for all expenditures incurred over the lifetime of a particular structure.

A life cycle cost is equal to the construction cost plus the present value of future utility, maintenance, and replacement costs over the life of the building.

These estimates have the potential to change, once the project enters the detailed design phase. There have been miscellaneous expenses that have been considered in the budgetary design of each alternative, however during the construction on design of a project, hidden expenses could incur on the costing of each alternative.

### *7.2.1 Do Nothing Alternative Cost Estimate*

The initial cost of the Do Nothing approach will have no capital associated with it. However, due the fact that no recyclables will be diverted, and all waste generated from the Township of Emo will directly into the Landfill, the O&M cost associated with the Do Nothing alternative has a higher cost because it will increase the rate to run the Landfill will increase. At $17,940, the O&M calculated value was produces from the cost to generate a Northern Ontario Landfill of an equivalent size, as well the amount in that was presented in the Landfill Liability Assessment report. This report can be viewed in Appendix A. From this report an approximate value of 520 tonnes of waste is generated from the Town of Emo annually.

### *7.2.2 Current Program Cost Estimate*

The Town of Emo's current program from an economic perspective is costing $12,696 annually. This can be observed in the contract between the Town of Emo and Asselin Transportation and Storage as seen in Appendix F. There is no initial capital associated with this alternative. The estimated 30 year life cycle cost is $264,216. This does not include any increase or decrease to the current negotiated rate that could eventually change. This is dependent on a renewal of the agreement between the Town of Emo and Asselin Transportation and Storage.

### *7.2.3 Build a Recycling Depot Beside the Cloverleaf Grocery Store*

For Alternative 3, Build a recycling Depot beside the Cloverleaf Grocery Store, the initial capital cost associated with developing this alternative is $28,392. As viewed in Appendix F, the price estimate for the materials required is $19,392 before taxes. Along with the start up construction costs, are labour and the prices of the shipping containers for recyclable storage. The estimate shown in Appendix F, does not include the price of the shipping containers. However, the PIC poster boards, attached in Appendix B, indicate an estimated cost anywhere from $1,000 to $3,000. For this Environmental Assessment, the initial capital cost for 3 used shipping containers, was estimated to be $9,000.

The yearly O&M fee would remain the same as the O&M for Alternative 2, Continuing with the Current Program. The costs associated with developing Alternative #3 are outlined in PIC 1 which are attached in Appendix B. The information provided in the PIC 1 boards did not indicate the revenue which Alternative 3 would generate.

This alternative although idealistic in waste diversion, in terms of a 30 year life cycle cost, is estimated to cost the Town of Emo $289,942 in the 30 year life cycle costs.

### *7.2.4 Construct a Recycling Centre at the Emo Municipal Garage*

For this alternative, the initial capital was estimated to be $76,000. This estimated cost includes the price o constructing the extension to the Municipal Garage, materials for construction, labour for construction, concrete cost for the extension and the equipment. The equipment will include a quoted price of a baler. The price estimates for construction the Municipal Garage as well as the quote for the baler can be viewed in Appendix G.

The O&M cost is estimated at $10,440. This value includes the wages for a municipal employee for working 8 hours per week for one year. This also includes hydro to run the equipment, maintenance to the equipment, strapping for the bales and a cost for general miscellaneous costs.

The estimated revenue generated was calculated from the Economic Analysis in Appendix D. The pricing associated with the return revenue from the recycled goods indicates a $180 return per month, making it $2,160 annually. The 30 year life cycle cost is $246,576, making it the lowest value for all of the alternatives and the most economically appealing option for the Town of Emo.

## 8.0 Evaluation of Alternatives

### *8.1 Description of the Evaluation Method*

Under the EA Process, municipalities are required to consider all aspects of the environment in their assessment and evaluation of infrastructure projects. The EA Act includes a broad definition of the "environment", including the technical, natural, social, cultural, built and economic environments. The EA process requires a systematic evaluation of alternative solutions in terms of their advantages and disadvantages, and involves the consideration of both positive and negative effects on the natural, social, cultural, and economic environments as part of the assessment and evaluation process.

For the purpose of the evaluation, each alternative solution is subjected to a detailed comparative evaluation, using a "reasonable Argument Process", which describes the advantages and disadvantages of each alternative in response to the evaluation criteria. Based on the descriptions provided, each alternative solution is ranked in terms of how well it responds to the criteria.

### *8.2 Advantages and Disadvantages Evaluation*

An evaluation of the advantages and disadvantages of each of the alternatives has been provided in Table 3 below.

**Table 4: Advantages and Disadvantages for each of the proposed alternatives**

| Alternative Description | | Environmental Impact | | Social Impact | | Technical Consideration | | Economic Feasibility | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Advantage** | **Disadvantage** | **Advantage** | **Disadvantage** | **Advantage** | **Disadvantage** | **Advantage** | **Disadvantage** |
| **Alternative 1** | **Do Nothing** | | -Potential Odour<br>-Additional Landfill sites will have to be established, because current Landfill does not have required capacity<br>-High air pollution from increased number of vehicles bringing solid waste to landfill<br>- Higher traffic from increased number of vehicles<br>-Noise and Dust from Vehicles Transporting waste<br>-Potential Environmental Contamination from Solid Waste Leaching | -No burden on the residence to sort their recyclables<br>-Does not impact access in and out of Fire hall | -Negative Impact to the Town's Reputation for Solid Waste Management and Environment Maintenance<br>-Does not promote recycling within the community | -Nothing technical required<br>-Not complicated<br>-No construction or alterations required | -Reduces length of life of the landfill because recyclable not diverted | -No capital required | -Does not promote development of new business<br>- Does not establish new economic support for local area<br>-High capital required to develop a new landfill sooner |
| **Alternative 2** | **Continue with the Current Recycling Program** | -Recycling Solid Waste<br>-Reduce amount of Solid Waste being placed in Landfill<br>-Recyclables diverted from landfill | -Potential Odour<br>-Does not divert all recyclables from the Landfill, because limited capacity of current program<br>-High air pollution from increased number of vehicles bringing solid waste to landfill<br>-Higher traffic from increased number of vehicles<br>-Noise and Dust from vehicles Transporting waste<br>-Potential Environmental Contamination from Leaching | -Promote Environmental Protection and Resource Conservation<br>-Maintain Current Jobs of Manually Sorting the Recycled Materials<br>-Maintain the Town's image in environmental protection<br>-Promote recycling education<br>-Encourage residence to recycle | -Residents required to sort recyclables<br>-Residents required to deliver waste to facility<br>-Time consuming and inconvenient for the resident<br>-May impact access in and out of Fire hall | -Nothing technical required (no changes)<br>-Manual Separation of Mixed Recycling Materials by residence | -Labour Intensive to sort the mixed recyclables<br>-More time intensive<br>-Significant effort to re-sort the mixed waste into more diversified recyclable material piles<br>-Not all residence will sort their recyclables | -Maintain Current Budget for the Recycling Program | -Relatively Low Operations and Maintenance Cost (Approx. $12,000)<br>-High capital required to develop a new landfill sooner |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Alternative 3** | **Construct a Recycling Depot beside Cloverleaf** | -Extend the life of landfill<br>-Encourage Tree and Resource Conservation<br>-Reduce potential odour impact from Landfill<br>-More diverse collection available, therefore more waste diverted from Landfill<br>-Reduce vehicle traffic at recycling depot because utilizing cardboard recycling at Cloverleaf<br>-No additional vehicle emissions-recycling and grocery store at same location | -Dust and Noise from vehicles at recycling depot<br>-Potential Environmental Contamination from Leaching<br>-Likelihood for recyclables entering the environment due to the depot being out in the open | -Increase town's reputation for solid waste recycling<br>-More Visually Pleasing<br>-Promote recycling education<br>-Encourage residence to recycle<br>-Easy for residence because can dispose of recyclables at same time as grocery shopping<br>-Grocery store can utilize recycling depot-no additional transportation required<br>-Does not impact access in and out of Fire hall | -Increase Traffic and Potential Short-Period Road Blockage during the Initial Construction and Installation Stage<br>-Elimination of the Current Jobs of Utilizing Manual Recycling Material Sorting<br>-Residence required to sort more<br>-Additional traffic disruptions because depot will draw a higher concentration of people<br>-Towns people will have no input on the recycling program<br>-Visually unappealing entrance to the town off the Trans Canada Highway | -More diverse collection of recyclables available<br>-Less labour at Landfill required to sort because residence required to increase diversity of sort<br>-Increases life of Landfill | -Bin locations and truck pickup routines<br>-Must coordinate schedules of grocery delivery and recyclables pick-up<br>-Potential noise and dust from vehicles<br>-Potential site constraints<br>-Regulatory permit and approval applications<br>-Not all residence sort their waste<br>-May not be enough parking for additional vehicles | -Attract New Businesses and Surrounding Residences via Promoting Solid Waste Recycling and Providing More Landfill Spaces<br>-Low O&M costs in Long-Term<br>-Create construction jobs | -Increased Annual Cost of Approximately $19,000, not including the Construction Cost<br>-Funding Maybe Required |
| **Alternative 4** | **Construct a Recycling Center by Extending the Building Garage to include 8 Stalls for Separate Bin for Collected Recycled Goods. This Alternative will also have Smaller Bins at the Local Landfill.** | -Extend life of Landfill<br>-Encourage tree and resource conservation<br>-Reduce potential odour from Landfill<br>-More diverse collection available, therefore more waste diverted<br>-High amount of waste diverted from Landfill because of more diverse collection program<br>-Decreased the amount of recyclables entering the environment because the recyclables will be contained indoors | -Dust and Noise from vehicles at recycle depot<br>-Potential Environmental Contamination from Leaching | -Utilize the existing garage<br>-Maintain better environment (remove/reduce solid waste piling at the Landfill Site)<br>-Increase Town's reputation in solid waste recycling<br>-More Visually Pleasing<br>-Promote recycling education<br>-Encourages residence to recycle<br>- Town will have input on the recycling program to suggest improvements | -Elimination of the Current Jobs of Utilizing Manual Recycling Material Sorting<br>-Existing Trees/Plants maybe Disturbed at the Landfill Site<br>-More sorting required from resident<br>-May impact access in and out of Fire hall | -Utilize existing building<br>-Less labour at Landfill required to sort because residence required to increase diversity of sort<br>-Increase life of Landfill<br>-Long-term solution | -Potential Dust and Noise due from vehicles<br>-coordinate truck schedules | -Attract new businesses and surrounding residences via promoting solid waste recycling and providing more Landfill spaces<br>-Lower O&M in long-term<br>-Create construction jobs | -Estimated annual cost of approximately $14,000, not including the construction cost<br>-Funding maybe required |

### *8.3 Evaluation Matrix*

The evaluation criteria used to assess alternative solutions is largely based on qualitative measures. This qualitative evaluation is used to identify and describe the advantages and disadvantages of each potential solution that are not easily measured or quantified, while incorporating a number of different considerations. For some criteria, quantitative measures have been used to compare the advantages and disadvantages for criteria in numeric terms, where the higher (or lower) value indicates a better score. The evaluation can be viewed in Table 4.

**Table 5: Evaluation Matrix to Evaluate the Preferred Alternative**

| Total Weighting | 15% | 30% | 20% | 35% | | | | 100% |
|---|---|---|---|---|---|---|---|---|
| Criteria | Environmental Impact (%) | Social Impact (%) | Technical Consideration (%) | Economic Feasibility (%) | | | | |
| Sub Categories | | | | Low Capital | Low O&M | High Revenue | Low 30 Year Life Cycle Cost | Score |
| Weighting (%) | 15.0% | 30.0% | 20.0% | 8.8% | 8.8% | 8.8% | 8.8% | 100.0% |
| Do Nothing | 0 | 0 | 0 | 4 | 1 | 1 | 1 | 15% |
| Continue with current program | 3 | 2 | 2 | 4 | 2 | 1 | 2 | 56% |
| Recycling depot beside Cloverleaf Grocery | 3 | 4 | 4 | 2 | 2 | 1 | 3 | 79% |
| Recycling Centre at Emo Municipal Garage | 4 | 4 | 4 | 1 | 4 | 4 | 4 | 93% |

| | |
|---|---|
| 4 | Meets the criteria fully |
| 3 | |
| 2 | Only semi meets the criteria |
| 1 | |
| 0 | Does not meet the criteria |

| Economic Feasibility | | | | |
|---|---|---|---|---|
| | Capital | O&M | Revenue | 30 Year Life Cycle |
| 1 | 0 | $17,940 | 0 | $369,564 |
| 2 | 0 | $12,696 | 0 | $264,216 |
| 3 | $28,392 | $12,696 | 0 | $289,942 |
| 4 | $76,000 | $10,440 | $2,160 | $246,576 |

### *8.4 Identification of the Preferred Alternative*

The preferred alternative is the solution that best suits the Town of Emo and meets the criteria used to evaluate the alternatives. Alternative 4: Construct a Recycling Center at the Emo Municipal Garage is the preferred solution to the problem facing the township. All residents within the township are fully encouraged to use the Recycling Centre. For those individuals that use the Landfill's recycling bins will be able to continue with their waste diversion process with the bin provided for product separation. The preferred solution will benefit the community and the environment, as well as extending the life of the existing Landfill.

## 9.0 Preliminary Design

### *9.1 Preliminary Design*

The proposed preliminary design represents Alternative 4. This Alternative is to construct a Recycling Centre at the Emo Municipal Garage. This design included the existing garage and by adding and constructing an extension to the building, a Recycling Centre can be created. The draft design that can be viewed in Appendix H, illustrates that the extension to the building will be 40 x16 feet that includes a hall way and 8 stalls for various sorted recycled goods. This design also includes a location for a baler, which will be used to compact and bale the sorted recyclables. The entrance to the Recycling Centre will be from the 'man door' on the east side of the building.

### *9.2 Logistics*

The design has taken into account the need for the baler to be close to the sorted recyclable goods. With the preliminary design, residents will enter the Municipal Garage and use the hall way to select the proper marked location for the recycled goods. When the stalls are full, a Municipal employee will collect the selected sorted goods and transport them to the baler. From there, the employee will compact and bale the items and then stack the bales in the deemed storage area, until there are enough stacked goods ready for pick up.

#### 9.2.1 *Stall System*

This design will have 8 stalls for the separation of goods. The town residents will come into the building and then separate their recyclable goods into the marked stalls ranging from #1 plastics, #2 plastics, #3-#7 plastics, Tin cans, Aluminum cans, Glass bottles, Cardboard and a Non-sorted stall, for those residents that do not wish to sort their recyclable items.

There will also be bins at the landfill for those out of town residents that choose to recycle when they are taking their waste to the Landfill. When these bins are full, they will be collected and transported to the Emo municipal Garage to be baled and stored along with the other goods.

#### 9.2.2 *Baling and Storing*

A town Employee will be responsible to bale and store the sorted recycled goods. When the stalls in the Recycling Centre reach capacity, the employee will collect the selected sorted goods and transport them to the baler. From there, the employee will compact and bale the items and then stack the bales in the deemed storage area, until there are enough stacked goods ready for pick up. The goods will be collected and baled separately in order to collect a larger revenue from the recycling conglomerates that gathers the recyclable goods

#### 9.2.3 *Pick-up*

The preliminary design has indentified the need for pick up. Two companies have been sourced out for the pick of recycled good. Cascades and Buildrite are two companies within the surrounding regions of the Township of Emo that collect and process recycled goods. Due to the fact that the recyclables will be baled and stored at the Emo Municipal Garage, Pick-up will be scheduled as the amount of recyclables will fill an entire truck load and as required.

### *9.3 Preferred Design Capital Cost Estimate*

Based on the research into the pricing on the necessary equipment needed to utilize the design, as well and the prices that come along with the transport of the recycled goods and labour and materials needed to construct the design, an associated capital cost estimate can be generated. For the preferred design, the associated Capital Cost has been estimated at $ 76,000.00. This estimate has the potential to change, once the project enters the detailed design phase.

## References

*Emo Landfill Site: Closure and Post Closure Liability Assessment*. Prepared by: K. Smart Associates Limited, January 14, 2009.

# Appendix A

## Emo Landfill Site
## Closure and Post Closure Liability Assessment

**K. SMART ASSOCIATES LIMITED**
CONSULTING ENGINEERS AND PLANNERS
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January 15, 2009

Ref. Num.: 08-011

Brenda Cooke
Township of Emo
39 Roy Street
Box 520
Emo, ON P0W 1E0

Regarding: **Emo Landfill Site – Liability Assessment Report**

We have completed our assessment report on the Emo Landfill Site. Enclosed are three copies of the report.

Our evaluation of the landfill site indicates a remaining lifespan of 18 years. After closure the contaminating lifespan of the landfill is 36 years. The total present value of the closure and post closure costs is approximately $138,000. Based on this cost and the percentage of landfill volume used, the current landfill liability is $72,619. This landfill liability must be recalculated each year as the landfilled volume increases.

If you have any questions please feel free to call.

S Swanton

Sandra Swanton
K. Smart Associates Limited
sswanton@ksmart.on.ca

# Emo Landfill Site

## Closure and Post Closure Liability Assessment

Emo, Ontario
January 14, 2009

K. Smart Associates Project Reference # 08-011



K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS & PLANNERS
KITCHENER • SUDBURY • ENGLEHART • RAINY RIVER

# Table of Contents

## Introduction

The Emo Landfill is located south of the Village of Emo on Howse Road off Hwy 602 in the southwest quarter of Section 27 in the former Township of Lash.

In November 2003, R. J. Burnside and Associates Limited completed an economic assessment of the landfill site. The assessment indicated a present value cost of over $250,000 for closure and post closure care of the landfill. The assessment indicated that in 2003 the landfill had a remaining lifespan of 6 years, with closure projected to occur in 2009.

At the time of writing this report, the site has not approached the total capacity of the landfill and there remains a significant portion of unused landfill space available for disposal. As a result, the landfill is not slated for closure in 2009 and the Township of Emo has retained K. Smart Associates Limited to complete a reassessment of the landfill closure and post closure costs and landfill liability.

## Existing Conditions

According to the Provisional Certificate of Approval issued by the Ministry of the Environment May 22, 1990, the Emo Landfill consists of a 3 hectare landfilling area with a total site area of 120 hectares. The landfill was opened in 1989 and has been in continuous operation. The Village of Emo has a weekly garbage collection program for residents and the landfill site is open three days a week to receive waste from other sources.

Some waste is diverted from the landfill through a bi-monthly recycling collection program. As well, upon arrival to the landfill site, waste is sorted and burnable solid waste is burned rather than landfilled. These measures have reduced the annual volume of landfilled waste.

## Waste Generation Rate

According to the Emo Landfill Operating Plan dated December 15, 1988, prepared by the Township of Emo, the weekly waste generation rate was estimated at 10 tonnes, which is 520 tonnes/year. At that time the population of Emo was 1,127 and there was no recycling program. Currently the population of Emo is 1,301 (2006 census) and there is a recycling program with bi-monthly collection.

In order to verify the waste generation rate, a topographical survey of the landfill site was conducted. The amount of fill was determined by comparing the 2008 topographical survey with the topographical data from 1988. The total landfilled volume of waste is equal to the amount of fill. The total landfilled volume was divided by the number of years of operation (1989-present) to determine an average annual waste generation rate of 3,155 $m^3$/yr.

An in-situ waste density of 300 kg/$m^3$ was used to convert the volume of waste to the mass of waste in tonnes in order to calculate the contaminating lifespan of the landfill.

## Design Capacity of Landfill

The total capacity of the landfill was estimated at 120,000 $m^3$. This volume is equal to a landfill area of 3 ha with a depth of 4 m. Of the total capacity, approximately 63,095 $m^3$ are in place.

Based on the remaining capacity and assuming a consistent waste generation rate in the future, the remaining lifespan of the landfill is 18 years.

## Landfill Closure Procedures

In 1998 the Ministry of the Environment released guidelines regarding the closure of landfills. (*MOE Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites, May 1998*). The landfill closure requirements included in this assessment are based on these guidelines.

### *Final Cover*

The purpose of the final cover is to limit the uncontrolled release of landfill gas, control the amount of infiltration through the landfill, suppress proliferation of vectors (rats, flies, etc), limit potential for fires, and to provide a suitable surface for revegetation. The final cover of the landfill is to consist of the following components, from bottom to top:

- 600mm of cover material
- 150mm of top soil
- Vegetative cover

### *Screening*

Landfill closure should include the planting of screening vegetation. Trees planted along the southern side of the landfill property will provide screening from the road.

## Contaminating Lifespan

After closure, waste in the landfill continues to degrade and contaminants will be released into the environment until waste decomposition is complete. The contaminating lifespan of the landfill after closure is calculated based on the amount of waste within the landfill, the concentration of contaminants and the amount of infiltration through the landfill.

Chloride is generally the parameter of concern when estimating the contaminating lifespan of a landfill because it is non-reactive. The Reasonable Use concept was used to determine the concentration of chloride at which the landfill would cease to be considered a contaminating landfill. A maximum allowable concentration of 130 mg/L was calculated based on the Reasonable Use equation shown in Equation 1. When the concentration of chloride in the landfill leachate reaches this level, the landfill has reached the end of its contaminating lifespan.

**Equation 1**

$$c_m = c_b + x(c_r - c_b)$$

Where:

$c_m$ - maximum allowable concentration of contaminant (mg/L)

$c_b$- background concentration of contaminant (10 mg/L)

$c_r$ - max concentration that should be present based on reasonable use of groundwater (250 mg/L)

x - constant (0.5 for non-health related contaminants)

The contaminating lifespan of the landfill was calculated using Equation 2.

**Equation 2**

$$c_{oL}(t) = c_o \exp\left(\frac{-q_o c_o t}{m_a}\right)$$

Where:

$c_{oL}(t)$ - concentration of contaminant at time, t (mg/L)

$c_o$ - peak concentration of contaminant (mg/L)

$q_o$ - annual average infiltration through the landfill (mm)

t - time (years)

$m_a$ - mass of contaminant per unit area of the landfill (mg/kg)

It was determined that the contaminating lifespan of the landfill is 36 years after closure. The complete calculations are included in Appendix A.

## Closure and Post Closure Costs

There are a number of costs associated with landfill closure and post closure procedures. Site closure costs include the final cover and screening vegetation. The post closure costs include water sampling and preparation of an annual report as well as some maintenance of the final cover vegetation and screening vegetation.

The cost analysis is included in Appendix A. The total present value of the closure and post closure is $138,113.

## Landfill Liability

As required by Section PS 3270 of the Public Sector Handbook, the costs associated with the closure and post closure care of a landfill are reported as a landfill liability based on the percentage of landfill used.

Landfill Liability = present value cost x current landfilled tonnage/site capacity

Using this equation, the Township of Emo's current liability for the Emo Landfill Site is $72,619. This is the amount that must be reported. The Landfill Liability must be recalculated each year as the landfilled volume increases.

All of which is respectfully submitted;

David A. Harsch, P.Eng.
K. Smart Associates Limited

Sandra Swanton, B.Sc. (Eng.)
K. Smart Associates Limited

# Appendix A

Contaminating Lifespan Calculations
Closure and Post Closure Cost Estimate

# Emo Landfill Site

## Calculation of Post Closure Contaminating Lifespan of Landfill

**Parameters**

| | |
|---|---|
| Chloride Mass in Leachate as Portion of Total Waste Mass [1] | 1800 mg/Kg |
| Total Mass of Waste [2] | 36000000 kg |
| Footprint of Landfilling Area | 30000 $m^2$ |
| Contaminant Mass per Unit Area (kg/m2) | 2.16 kg Cl/m2 |
| Average Annual Precipitation [3] | 750 mm |
| Average Annual Potential Evapotranspiration [4] | 533 mm |
| Excess Water | 217 mm |
| Infiltration Factor [5] | 0.65 |
| Average Annual Infiltration | 0.14105 m |
| Chloride Concentration in Leachate [6] | 750 mg/L |
| Background Chloride Concentration | 10 mg/L |
| Maximum Chloride Concentration that Should be Present [7] | 250 mg/L |
| Maximum Allowable Chloride Concentration (Reasonable Use) | 130 mg/L |

**Reasonable Use Equation:**

$$c_m = c_b + x(c_r - c_b)$$

Where:

$c_m$ - maximum allowable concentration of contaminant (mg/L)

$c_b$ - background concentration of contaminant

$c_r$ - max concentration that should be present based on reasonable use of groundwater

x - constant (0.5 for non-health related contaminants)

**Contaminating Lifespan Equation:**

$$c_{oL}(t) = c_o \exp\left(\frac{-q_o c_o t}{m_a}\right)$$

Where:

$c_{oL}(t)$ - concentration of contaminant at time, t (mg/L)

$c_o$ - peak concentration of contaminant (mg/L)

$q_o$ - annual average infiltration through the landfill (mm)

t - time (years)

$m_a$ - mass of contaminant per unit area of the landfill (mg/kg)

| Year | Concentration (mg/L) |
|---|---|
| 0 | 750 |
| 1 | 714.153205 |
| 2 | 680.0197335 |
| 3 | 647.5176962 |
| 4 | 616.5691173 |
| 5 | 587.0997483 |
| 6 | 559.0388891 |
| 7 | 532.3192192 |
| 8 | 506.8766352 |
| 9 | 482.6500981 |
| 10 | 459.5814859 |
| 11 | 437.6154548 |
| 12 | 416.6993061 |
| 13 | 396.7828599 |
| 14 | 377.8183348 |
| 15 | 359.7602329 |
| 16 | 342.5652311 |
| 17 | 326.192077 |
| 18 | 310.6014896 |
| 19 | 295.7560657 |
| 20 | 281.6201896 |
| 21 | 268.159948 |
| 22 | 255.3430484 |
| 23 | 243.1387418 |
| 24 | 231.5177489 |
| 25 | 220.4521899 |
| 26 | 209.9155173 |
| 27 | 199.8824526 |
| 28 | 190.3289255 |
| 29 | 181.2320162 |
| 30 | 172.5699002 |
| 31 | 164.3217965 |
| 32 | 156.4679168 |
| 33 | 148.989419 |
| 34 | 141.8683614 |
| 35 | 135.08766 |
| 36 | 128.6310471 |

**Notes:**

1. MOE Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites (May 1998)
2. Mass of waste based on landfilled waste 4 m deep over 3 ha at 300 kg/$m^3$
3. Environment Canada Climarte Normals 1971-2000 - Emo Radbourne Station ID#602K300
4. The Atlas of Canada - Evapotranspiration, Water Deficit, Growing Degree Days Map
5. Infiltration Factor (From Table 2 of MOEE Hydrogeological Technical Info Requirements)

| | |
|---|---|
| Topography - flat land | 0.3 |
| Soil - clay loam | 0.2 |
| Cover - grasses | 0.15 |
| **Cumulative Infiltration Factor** | **0.65** |

6. Table 11-13 of *Integrated Solid Waste Management* - Tchobanoglous/Thiesen/Vigil
7. Ontario Drinking Water Objective is 250 m/L for chloride

## Emo Landfill Site

### Estimated Closure and Post Closure Costs

**Parameters**

| | | |
|---|---|---|
| Base Year | 2008 | |
| Filling Area | 30000 $m^2$ | |
| Current Landfilled Volume | 63095 $m^3$ | (Based on survey data) |
| Landfill Capacity | 120000 $m^3$ | (4.0 m deep over 3 ha) |
| Annual Waste Generation Rate | 3155 $m^3$/yr | (Based on survey data) |
| Remaining Active Life | 18.0364501 years | |
| Waste Density | 300 $kg/m^3$ | |
| Contaminating Lifespan | 36 years | |
| Interest Rate | 5.0% | |

| Cost Item | Quantity | Units | Unit Cost | Year Undertaken | Capital Cost | Present Value Cost | Comments |
|---|---|---|---|---|---|---|---|
| **Landfill Closure** | | | | | | | |
| Final Cover Material | 20700 | $m^3$ | 2.75 | 2027 | $56,925 | $22,527 | 600mm thick cover over filling area plus 15% |
| Top Soil | 4500 | $m^3$ | 10 | 2027 | $45,000 | $17,808 | 150mm thick top soil over filling area plus 15% |
| Vegetative Cover | 34500 | $m^2$ | 0.32 | 2027 | $11,040 | $4,369 | grass vegetation on filling area plus 15% |
| Screening Vegetation | 200 | m | 50 | 2027 | $10,000 | $3,957 | trees along front of landfill |
| Engineering and Contract Admin. (10%) | | | | 2027 | $12,297 | $4,866 | engineering and contract administration for site closure |
| Contingency (10%) | | | | 2027 | $13,526 | $5,353 | contingency allowance of 10% |
| **Landfill Closure Total** | | | | | | **$58,880** | |
| **Post Closure** | | | | | | | |
| Surface Water Monitoring | 1 | LS | 6000 | 2027 to 2063 | $6,000 | $39,289 | Sampling at swamp outlet in spring, summer and fall |
| Annual Report of Monitoring | 1 | LS | 2000 | 2027 to 2063 | $2,000 | $13,096 | annual report to MOE |
| Site Maintenance | 1 | LS | 1000 | 2027 to 2063 | $1,000 | $6,548 | any required maintenance of final cover and screening |
| Administration | 1 | LS | 2000 | 2027 to 2063 | $2,000 | $13,096 | |
| Contingency (10%) | | | | 2027 to 2063 | $1,100.0 | $7,203 | contingency allowance of 10% |
| **Post Closure Costs Total** | | | | | | **$79,233** | |

| **Cost Summary** | |
|---|---|
| Landfill Closure | $58,880 |
| Post Closure | $79,233 |
| **Total** | **$138,113** |

| | | |
|---|---|---|
| **Current Landfill Liability** | **$72,619** | (present value x (current landfilled tonnage/site capacity) |

# Appendix B

## Public Information Centre #1

PIC Notice
Sign-in Sheet
PIC Poster Boards
Comment Sheet

The Corporation of the Township of Emo
P.O. Box 520, Emo, Ontario, P0W 1E0

Website: www.emo.ca
E-mail: township@emo.ca

Phone: 807-482-2378
Fax: 807-482-2741

# Recycling Meeting

Open Forum

Wed., March 30, 2011
5:00 p.m. – 8:00 p.m. at Arena (upstairs)

**Your input is needed on the future of the Recycling Program:**

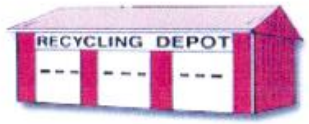
-possibility of "banning of plastic bags"
-recycling centre proposal
-charitable group opportunities

## Everyone Welcome

Emo Recycling Public Meeting
Wed., March 30/11
Sign In Sheet.

| NAME | PHONE # |
|---|---|
| 1. GARY JUDSON | 482-2428 |
| 2. Jan Judson | 482-2428 |
| 3. Robert Stewart | 487-1642 |
| 4. Dave Ogilvie | 482-2540 |
| 5. VINCE SHEPPARD | 482-2819 |
| 6. RETA DYKSTRA | 482-1241 |
| 7. Gerrie Kamerman | 482-2842 |
| 8. Melissa Wiebe | 482 1070 |
| 9. Janet Lowry | 482-2585 |
| 10. Peter Swart | 482-2210 |
| 11. TERRY NEUMAN | 274-2014 |
| 12. Arend Wielinga | 482-2217 |
| 13. ROBERT SIMMONS | 482-3290 |
| 14. Pat Ogden | 482-2255 |
| 15. Mike Williams | 482-1512 |
| 16. SHIRLEY SHEPPARD | 482-2819 |
| 17. Dana Kompost | 482-2499 |
| 18. | |
| 19. Lori Shotteed | 482-1002 |
| 20. Carol Inkster | 482 2112 |
| 21. Rachel Schmutz | 482-3203 |
| 22. Brenda Cooke | 482-2245 |

23. Anthony Leek 482-1070




Recycling
Depots

# RECYCLING

# Characteristics of a Good Recycling Program

- A good recycling program rewards the community. Sometimes *thinking* about doing something doesn't always translate into *actually doing* something. It's difficult to guilt people. There is only one way to make people recycle. REWARD THEM.
- A good recycling program must be efficient. The "Least cost management" business model is often used. The collection cost is low and the processing cost is low.
- A good recycling program often achieves single stream recycling, that is, there is very little sorting.
- A well run recycling depot has a high percent of waste diversion. This benefits the community as direct capital costs of waste disposal are reduced but also many hidden costs.
- A successful recycling depot is almost always in a high traffic, in your face area, and is convenient to the users.
- A good recycling program usually involves local charity groups
- Due to efficiencies in transportation sorting and compacting takes place on site
- The entrance is well marked and attractive.
- Often there is a sign stating how the community has benefited from recycling.
- Signs stating what can and cannot be recycled and where
- Bins that suit what is being recycled often of different colours.
- A good Recycling Program has a higher percentage of aluminum
- A good Recycling Program makes money

# Emo's Current Recycling Program

- Collection is very efficient but processing is not. The town currently pays $1058.00 per month ($12,696.00 per year). This is money that leaves our community. The community is not rewarded for its efforts but penalized.
- The processing is not single streamed – cardboard, aluminum, tin, plastics are all mixed together. This is inefficient.
- Aluminum is one commodity that creates profit. It appears to be a low percentage of the total.
- The depot is not well marked and unattractive. It is located in a low traffic out of the way place.
- There is no sign stating how the community has benefited.

# “Least Cost Management”
# RECYCLING

# Reward users for Recycling
# "Charity Based Recycling"

Often in our store we are approached by charity groups for donations. Is this the same for the town? We like to make them work for their donations and as an example often donate supplies for a hot dog sale. Currently the town pays 1,058.00 per month for processing. What if a charity or charity of the month were to take on this responsibility? Would the town instead of paying $1058.00 not donate to the charity $500.00 per month? The rest of the money could be used for upkeep. As a bonus to the charity it would keep the profits from recycling. There is potential here for a charity to make over $1,000.00 per month

# PROCESSING

A charity would be chosen for a period in time. They would be responsible for sorting and compacting. This system is beneficial because:

1/ It rewards the community for recycling.

2/ When the user sorts they are more likely to be single streamed. (Little Johnny who just sorted it last week will tell his dad not to put the cardboard in the aluminum bin)

3/ The $12,696.00 would remain in our community and the charity would get to keep some of the profits.

# Compacting

- Cloverleaf Grocery has a compactor. It is on rollers and could be moved to the containers. We would provide it free of charge in order to get a system established. It may be necessary for another compactor in the future

# USED SHIPPING CONTAINERS

Used Shipping Containers can be purchased, depending on size
for between $1,000.00 and $3,000.00.
They range in size between 10 and 53'

A Hole would be made at one end
for the user and would open at the
other end for processing.
If there is a large volume, pallet bins
could be used inside the container


If found efficient, commodities
could be compacted and stored
in these containers

Shipping Containers would be painted different colours. Depending on what is being recycled. They would be WELL MARKED as to what is to be put in the container. If at all possible pictures would be used.

One large container for cardboard, One large container for #1 and #2 plastics, One medium size container for tins, One attractive one for aluminum, and one for 10cent beer cans.


A very attractive aluminum receptacle would be at the entrance. On it would be stated the charity and amount raised the previous month

# LOCATION

The recycling center should be set up in a high traffic area – "in your face" area.

# Attractive Entrance

Signage would have to put up on the fence. It would state the months charity as well as how much money was fundraised the previous month

# Aluminum Bin at Entrance


# Potential Recycling Revenue

**CARDBOARD-** Currently we recycle cardboard by taking it to Bilt-Rite in International Falls. They currently give us $140.00 per ton. This works out to between 350.00 and 400.00 per load. We take 16 loads per year

**PLASTICS #1& #2-** We take plastics to Omands Creek in Winnipeg. Once crushed we generally deliver with only ¼ of the truck full.There is no money in this - $40.00 per load

**ALUMINUM-** There must be money in this as it is frequently stolen

**Tin-** ??

I would project that a charity would be able to generate $1,000.00 by sorting. (this would include the town donation of $500.00)

# Set Up Costs

Road Turnaround ???

Bins 4,000.00 to $8,000.00 with modifications??

Signage $1,000.00

Mics $1,000.00

Maintenance Costs???

# Funding

Government Grant ???

$558.00 town saves per month

Cloverleaf Grocery

Volunteer  Labour

# Other GREEN Ideas

Ban Plastic Bags

The Center could expand to include:

Composting, Wood Chipper, Glass Recycling

## Emo Recycling Public Meeting
## Public Comments/Ideas – March 30, 2011.

- I am interested in glass recycling like Red Lake has which can employ someone who is on welfare. Hazardous Waste at least once a year locally.

- Great work, please include the youth to get them aware of what their garbage does! A training session for charities and groups planning to participate, operation of machinery should be done by trained adult only! Lets all work together to promote this awesome idea! Thanks Mark for all your enthusiasm.

- Excellent ideas! Hope something comes of it.

- Great idea! Do it!

- I love your recycling ideas. It looks more orderly, efficient and attractive.

- Some items are too large to fit through the opening (laundry soap containers) and it's too difficult to try and lift the lid. Send out a "how to" list on preparing your material for recycling. (flatten cans), I think people would recycle more if we hold "pick-up" again. – P. Ogden.

- Whispering Pines Saddle Club is interested call Bev 482-2745, missed meeting, our meeting was at the same time.

# Appendix C

## Public Information Centre #2

PIC Notice
Sign-in Sheet
PIC Poster Boards

**NOTICE OF PUBLIC MEETING**
**Class B Environmental Assessment**
**For Township of EMO Recycling Strategy**
**PUBLIC INFORMATION CENTRE #2**

The Township of Emo initiated a Class Environmental Assessment (EA) to identify and evaluate options to expand the current recycling initiative and the creation of a new recycling facility in order to meet the existing and future demands within the Township of Emo. A Public Information centre was completed, identifying possible facility locations and layouts for a new facility and strategy to improve the current recycling program as well as the storage capacities to meet the increasing desire the Town of Emo has to recycle. The purpose of the EA study is to identify the preferred strategy for satisfying the current demand and meet future recycling needs and quality objectives.

**The Process:**
The Study is being conducted in accordance with the requirements of the Municipal Class Environmental Assessment, June 2000 (as amended in 2007) which is an approved process under the Environmental Assessment act and is being conducted to satisfy the Class EA requirements for a Schedule B Project.

**Project Description:**
The study area of the Recycling Strategy has a new proposed location at 27 Canning Lane. The location is adjacent to the Emo Fire Department. The Recycling facility will include an extension to the existing building to include 8 bins for the separation of recycled goods. The Town of Emo will then commission companies to pick up the collected recyclables and ship them to processing plants.

The Public Information Centre to review the preferred solution will be held:

**Public Meeting #2:**

| | |
|---|---|
| Date: | July 11, 2011 |
| Time: | 5:00 p.m. – 8 p.m. |
| Format: | Open House |
| Location: | Emo-LaVallee Community Centre |

**Project Contacts and Information:**
To learn more about the project, public meetings, or to communicate concerns, please contact either:

**Consulting Engineer**
S. Burnett & Assciates Ltd.
210 Broadway, Unit 203
Orangeville, ON L9W 5G4

T:519-941-2949
Email: info@sbaengineering.com

**Proponent**
The Corporation of the Township of Emo
P.O. Box 520
39 Roy Street
Emo, ON P0W 1E0
T:807-482-2378
Email: township@emo.ca

## EA Recycling #2 & Walking Trail #1 Information Meeting – July 11, 2011.

5-8pm at the Emo-LaVallee Community Centre.

| | NAME | ADDRESS | PHONE NUMBER |
|---|---|---|---|
| 1 | Anthony Leek | Emo | 482-1070 |
| 2 | Irwin Maglio | Emo | 482 2662 |
| 3 | Rory Cook | Emo | 482-2451 |
| 4 | Bob Cook | Emo | 276-0442 |
| 5 | Verney Mongrain | Emo | 482-2499 |
| 6 | Ed Bullied | Emo | 482-2194 |
| 7 | Sue Farmer | Barwick Emo Box 268 | 482-1653 |
| 8 | VINCE SHEPPARD | EMO | 482 2514 |
| 9 | Mark Loney | EMO | 482-2861 |
| 10 | Jaynus Bragg | Emo | 482-2478 |
| 11 | Tom Mosher | Emo | 482 2171 |
| 12 | Emily Mosher | EMO | 482-2177 |
| 13 | S. SHEPPARD | Emo | 482-2819 |
| 14 | GARY HUDSON | EMO | 482-2428 |
| 15 | Conni Duelk | " | 482-9981 |
| 16 | ROBERT SIMMONS | EMO | 482-3290 |
| 17 | April Simmons | Emo | 482 3290 |
| 18 | Dave Stajkowski | Min of Environment | (807) 468-2536 |
| 19 | Melissa Wiebe | EMO | 482 1470 |
| 20 | BRENDA ELIAS | Emo | 482 3115 |
| 21 | MIKE HENRY | STRATTON | 483-1220 |
| 22 | Linda Dunn | EMO | 482-1548 |
| 23 | PETE MCQUAKER | EMO | 482-2210 |
| 24 | ANDREW NUSSBAUMER | EMO | 482-2714 |
| 25 | MICHELLE MARINARO | EMO | 482 2649 |
| 26 | TONY MARINARO | EMO | 482-2649 |
| 27 | PM Domaschuk + KIDS | EMO | 482-2616 |

| | | | |
|---|---|---|---|
| | Ned Cooke | Emo | 482-6476 |
| 5 | Verney Montgomery | Emo | 482-2499 |
| 6 | Ed Bullied | Emo | 482 2194 |
| 7 | Sue Farris Barwick | Barwick Emo Box 267 | 482-1995 |
| 8 | VINCE SHEPPARD | EMO | 482 2314 |
| 9 | Mark Loney | EMO | 482-2861 |
| 10 | Jayus Bragg | Emo | 482-2478 |
| 11 | Tom Meisner | Emo | 482-2771 |
| 12 | Emily Mosbeck | EMO | 482-277 |
| 13 | S. STEPHENS | Emo | 482-2819 |
| 14 | GARY HUDSON | EMO | 482-2728 |
| 15 | Connie Dueck | " | 482-9981 |
| 16 | Robert Simmons | Emo | 482-3290 |
| 17 | April Simmons | Emo | 482-3290 |
| 18 | Ron Stajkowski | Min of Environment | (807) 468-2806 |
| 19 | Melissa Wiebe | Emo | 482-1610 |
| 20 | BRENDA ELIAS | Emo | 482-5115 |
| 21 | MOE HENRY | STRATTON | 483-1220 |
| 22 | Linda Dunn | Emo | 482-1548 |
| 23 | PETE MCQUAKER | Emo | 482-2210 |
| 24 | ANDREW NUSSBAUMER | Emo | 482-2716 |
| 25 | MICHELLE MARINARO | EMO | 482 2649 |
| 26 | TONY MARINARO | EMO | 482-2649 |
| 27 | KIM Wanylchuk + KIDS | Emo | 482-3965 |
| 28 | Melissa Bragg | Emo | 482-2478 |
| 29 | Brenda Cooke | Emo | 482-2378 |
| 30 | | | |

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

# Class Environmental Assessment for Recycling Program

## Town of Emo

## Welcome to the Public Information Centre!

**(Please sign in on the form provided)**

**July 11, 2011**

# Background Information

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

- The Town of Emo currently spends $1058.00 monthly on a recycling program that collects cardboard, aluminum cans, #1 plastics, #2 plastics and #3-#7 plastics that are all mixed together.
- The Town has become environmentally aware of waste diversion, but the current program does not meet their demand.
- The current program serves residence within the Town. Residence outside of town use the Township of Emo landfill for all waste collection.

# CURRENT PROGRAM


Emo Municipal Garage

# CURRENT PROGRAM


# Existing Problems/Issues

- The Town of Emo's current recycling program does not meet the current demand for the Town.
- The current bins' capacity are exceeded on weekly basis between scheduled pick ups
- The Town of Emo spends $12,696.00 annually on its current program
- A new program and recycling centre are needed in order to satisfy the current and future demand

# Proposed Alternatives

- **Alternative 1:** Do Nothing
- **Alternative 2:** Continue with the current recycling program
- **Alternative 3:** Construct a recycling depot beside Cloverleaf Grocery
- **Alternative 4:** Construct a recycling centre by extending the Municipal Garage to include 8 stalls and separate bins for collected recycled goods. This alternative would also have smaller recycle bins at the local landfill for out of town residents.

# Criteria for Evaluation of Alternatives

- Technical Feasibility
  - Can it be done?
  - Is the technology proven?
  - What is the risk with the new technology?
  - Operational Accreditation Requirements?

- Environmental Impact
  - Does it comply with Environmental Regulations?
  - Are the environmental impacts known, or can they be predicted?
  - Can the environmental impacts be mitigated?

# Criteria for Evaluation of Alternatives

- Economic Feasibility
  - Capital Cost
  - Operation and Maintenance Cost
  - Life Cycle Cost Analysis
  - Economic Sustainability

- Social Impact
  - Financial Implications for residents
  - Impacts on economic development opportunities and the local business community
  - Impacts on land use and urban structures
  - Impacts on quality of life
  - Schedule for implementation
  - Longer term planning considerations

# Comparison of Alternatives

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

| OPTIONS | Description | Technical | Environmental | Social | Economic | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Capital | O&M | Revenue | 30 year LCC |
| 1 | Do Nothing | 0 | 0 | 0 | $0 | $20,000 | $0 | $400,000 |
| 2 | Current Program | 3 | 2 | 2 | $0 | $12,696 | $0 | $264,216 |
| 3 | Clover Leaf | 3 | 4 | 4 | $21,913 | $12,696 | $0 | $286,129 |
| 4 | Recycling Centre | 4 | 4 | 4 | $76,000 | $7,200 | $2,160 | $180,887 |

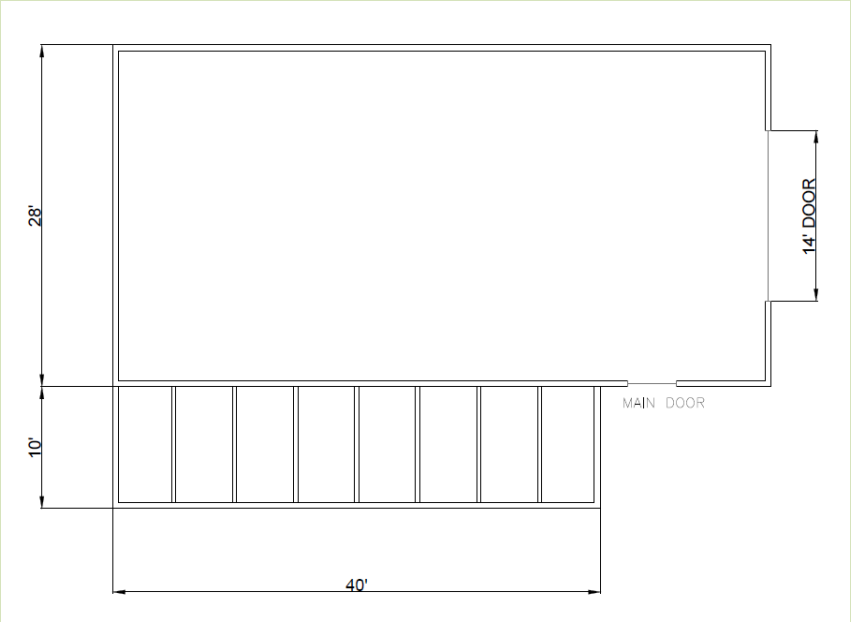
# Preferred Alternative

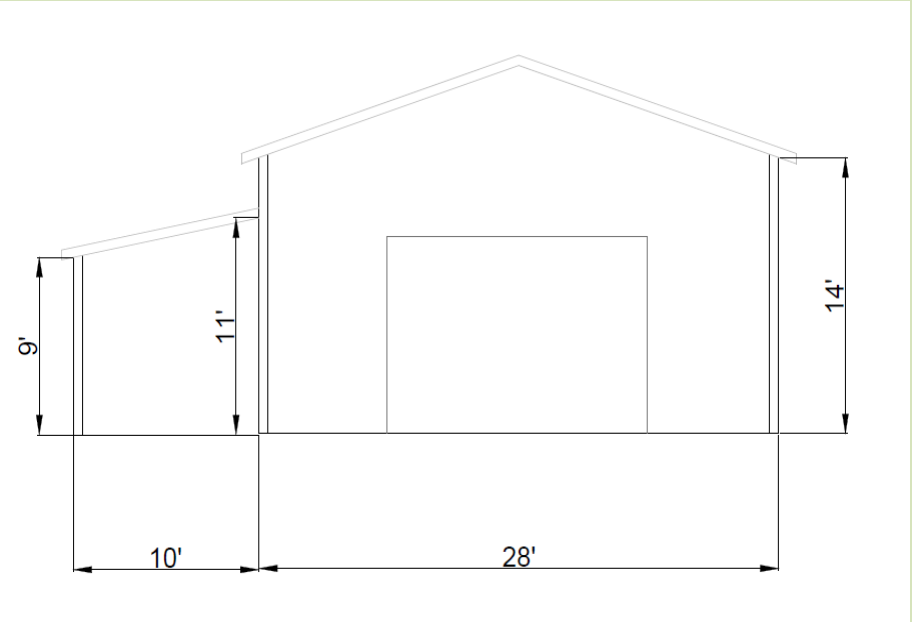
- The proposed solution to the problem is to upgrade and extend the current Municipal Garage on Canning Lane location
- This would include building 8 different stalls to house bins to separate the recycled goods
- The recycled goods to be collected would be:
  - #1 plastics
  - #2 plastics
  - #3-#7 plastics
  - Tin cans
  - Aluminum cans
  - Glass bottles
  - Cardboard
  - Non-sorted

# Preferred Alternative

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

## Draft Design of Proposed Alternative



# Preferred Alternative

- Along with the recycling centre at the Emo Municipal Garage location, there will also be recycling bins at the local landfill. This allows for residence outside of the Town to have access to recycling as well as diverting waste from the landfill.

- This will assist in extending the life of the landfill. Currently the landfill has a projected remaining lifespan of approximately 16 years.

- By diverting recyclable goods out of the collected garbage from the Town as well as the garbage of the surrounding area from entering the landfill, there is a greater possibility for residents to have less waste.

# Emo Recycling Centre

- The Recycling Centre will benefit the community by allowing for more storage of recyclables and provide an area to sort the collected recyclables in one location
- The Recycling Centre will assist in helping to extend the life of the existing landfill

# Next Steps

- Collect feedback on the preferred Recycling centre and revisions to the program
- Continue exchanges with Review Agencies and Stakeholders
- Determine necessary permits required for preferred alternative
- Finalize Environmental Assessment Study Report

# Appendix D

## Economic Analysis Estimates

**Appendix D: Economic Analysis Estimates**

| Product | % of Stream | density lbs/cu.yrd* | Kg/m3 | Destination | Revenue / kg | Shipping Cost $/KG | Volume (lbs) / month | Revenue / month | Net inc. Shipping | Source |
|---|---|---|---|---|---|---|---|---|---|---|
| #1 Plastics | 0.80% | 30.00 | 17.80 | | $ 0.25 | -$4.18 | 53.76 | $ 6.10 | $1.92 | Cascades - Winnipeg |
| #2 Plastics | 0.80% | 24.00 | 14.24 | | $ 0.27 | -$3.34 | 43.008 | $ 5.27 | $1.92 | Cascades - Winnipeg |
| #3-#7 Plastics | 0.80% | 50.00 | 29.66 | | -$0.30 | -$6.97 | 89.6 | -$12.19 | -$19.16 | Cascades - Winnipeg |
| Tin Cans | 0.80% | 150.00 | 88.99 | | $ 0.50 | -$20.90 | 268.8 | $ 60.96 | $40.06 | Cascades - Winnipeg |
| Aluminum cans | 0.80% | 50.00 | 29.66 | | $ 13.00 | -$6.97 | 89.6 | $ 528.34 | $521.38 | Cascades - Winnipeg |
| Glass Bottles | 18.20% | 500.00 | 296.64 | | -$0.35 | -$1,585.03 | 20384 | -$3,236.11 | -$4,821.14 | Cascades - Winnipeg |
| Cardboard | 18.75% | 50.00 | 29.66 | Buildrite - International Falls | $ 0.60 | -$68.04 | 2100 | $ 571.53 | $503.49 | Julie - Buildrite |
| Paper | 56.25% | 110.00 | 65.26 | | $ 0.80 | -$1,077.74 | 13860 | $ 5,029.43 | $3,951.70 | Cascades - Winnipeg |
| | 97.20% | | | | | -$2,773.17 | | $ 2,953.33 | $ 180.16 | |

| | |
|---|---|
| Recycling Generation | 6 - 8 yard bins + 1 / week |
| 56 | yards |

| Conversions | | |
|---|---|---|
| 1 lb/cu.yrd = | 0.593276 | kg/m3 |
| 1 lb = | 0.453592 | kg |

| Shipping Costs | | | |
|---|---|---|---|
| 1 truck = | 35 MT | $/KG | |
| $ to International Falls | | $250 | -$0.07 |
| $ to Winnipeg | | $600 | -$0.17 |

| Information Provided By |
|---|
| Cascades - Winnipeg |
| Buildrite- Julie |
| Seattle Public Utilities |

# Appendix E

Current Recycling Contract

Between the Township of Emo and
Asselin Transportation and Storage Limited

BETWEEN: **The Corporation of the Township of Emo**
P.O. Box 520
Emo, Ontario
P0W 1E0
(hereinafter called the "Township")

AND: **Asselin Transportation and Storage Limited**
P.O. Box 746
Fort Frances, Ontario
P9A 3N1
(hereinafter called the "Contractor")

WHEREAS the Township wishes to enter into an agreement with Asselin Transportation and Storage Limited to continue a recycling program within our community as a viable program to divert materials from the landfill site in part through reduction, re-use, recycling and recovery of waste.

NOW THEREFORE, this agreement witnesses that the Parties hereto, in consideration of the covenants herein, agree with on another as follows:

1.0 SERVICES

1.1 The Contractor agrees to provide services and satisfy conditions pursuant to this Agreement.

1.2 The Contractor is an independent contractor providing services to the Township and neither the Contractor nor the employees or agents of the Contractor shall hold themselves out as being or shall be construed to be employees of the Township. Acceptance of this Agreement does not constitute an appointment under the Township.

1.3 The Contractor shall provide pick-up of the following recyclable materials a minimum of once a week:

- Christmas wrap, paper bags, newsprint, flyers, junk mail, office paper, shredded paper and envelopes, magazines, cardboard egg cartons and paper tubes, flattened box board (cereal, cracker, shoe, tissue, laundry, packing boxes), milk cartons, juice cartons and boxes, pop and beer cases, corrugated cardboard, aluminum/steel beverage cans, metal food cans (rinsed), #1 - #7 plastics, shampoo containers and deodorant containers, glass and shredded paper.

1.4 The Contractor shall pick up recyclable materials at the following depots located within the Township of Emo, or other sites as agreed upon by the municipality and the contractor:

- Emo Landfill Site
- Emo Municipal Garage

1.5 The Contractor shall be responsible for maintaining a log of recycle quantities collected (i.e., tons of recycle products diverted from landfill site) to meet municipal reporting needs. The Contractor shall monitor activity at the landfill site.

2.0 COMMENCEMENT

This Agreement is for a term of five years, commencing on July 1, 2005 and ending on June 30, 2010.

3.0 REMUNERATION

3.1 The Township agrees to pay the Contractor $640.00 per month – as per quotation received from Asselin Transportation and Storage Limited. Asselin Transportation and Storage Limited agrees to invoice on a monthly basis. Additional bins, if required in the future, will be charged at $160.00/bin/month. Township of Emo and Contractor shall review and adjust rates to affect Cost of Living Index annually.

4.0 TERMINATION

4.1 Notwithstanding Section 2, the Township and/or Asselin Transportation and Storage Limited reserves the right to terminate this Agreement prior to its expiration:

a) without cause upon such conditions as the Township/Contractor may require 60 days written notice;
b) with cause upon breach of any of the terms and conditions contained in this Agreement on 20 days written notice to the Township/Contractor.

If the Township terminates the Agreement prior to its expiration, the Township shall only be responsible for the payment of expenditures incurred in connection with the Agreement up to and including the date of the termination. Notice of termination may be sent by registered mail or hand delivered to the last known address of the Contractor.

The Contractor can terminate this agreement by giving the Township 60 days written notice before the anniversary date of the agreement, that being the June 30th each year. The Contractor may terminate, cancel or quit at any other time, the Contractor shall pay the Township any additional costs the Township will have to pay to carry out the special conditions of this agreement to the immediate next June 30th.

4.0 ANNUAL REVIEW

4.1 The Township shall perform an annual review of the Contractors performance.

5.0 AMENDMENT

5.1 No change or modification of this Agreement shall be valid unless it is in writing and signed by the Township and the Contractor.

6.0 INDEMNIFICATION

6.1 The Contractor shall both during and following the terms of this Agreement indemnify and save harmless the Township from all costs, losses, damages, judgements, claims, demands suits, actions or other proceedings in any manner based upon, occasioned by or attributed to anything done or omitted to be done by the Contractor, its partners, directors, officers, employees, agents or volunteers in connection with services provided, purported to be provided or required from the Contractor pursuant to this Agreement.

6.2 If this Agreement or any provision in it, or any part of any provision, is found to be illegal or not enforceable such provision or part thereof shall be considered separate and severable from this Agreement and the remaining provisions of this Agreement shall remain in force and be binding upon the Parties as though the illegal or non-enforceable provisions had never been included.

7.0 INSURANCE

7.1 The Contractor shall maintain adequate insurance for a minimum of $1,000,000 to protect the Contractor (and the Township) from any claims for damages for personal injury, including death, which may arise from the services provided under this Agreement. Certificates of insurance shall be filed with the Township and shall be subject to the Township's approval as to adequacy of protection. Specifically S.P.F. #1 Standard Automobile Policy and a Contractor's Comprehensive General Liability Policy.

**IN WITNESS WHEREOF** the parties hereto have executed this agreement as of the day and year first above written.

SIGNED, SEALED AND DELIVERED

Dated this 1st day of July, 2005

THE MUNICIPALITY

REEVE

Brenda J. Cooke
ADMINISTRATOR/CLERK-TREAS.

ASSELIN TRANSPORTATION AND STORAGE LIMITED

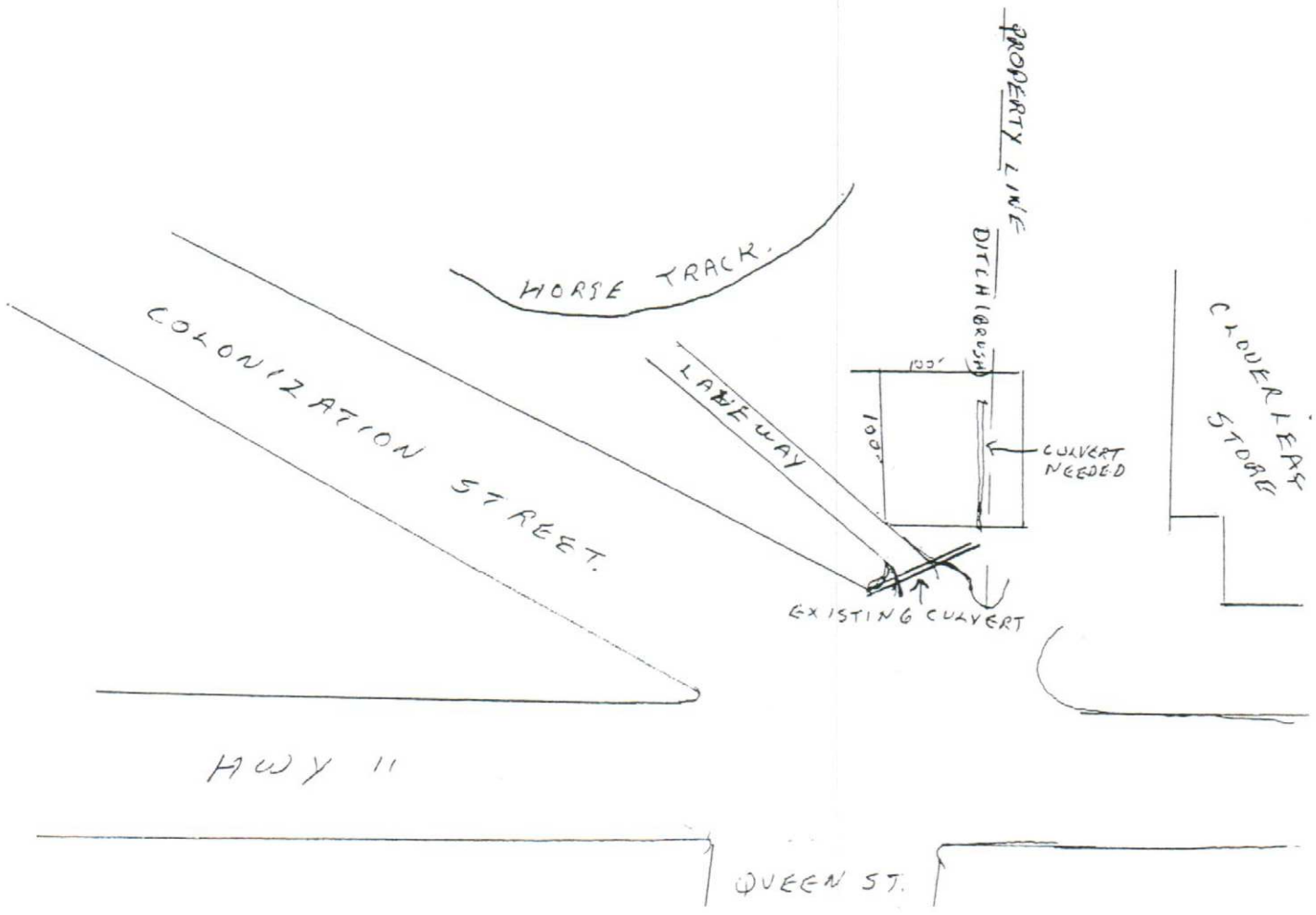
ELDON MOSE

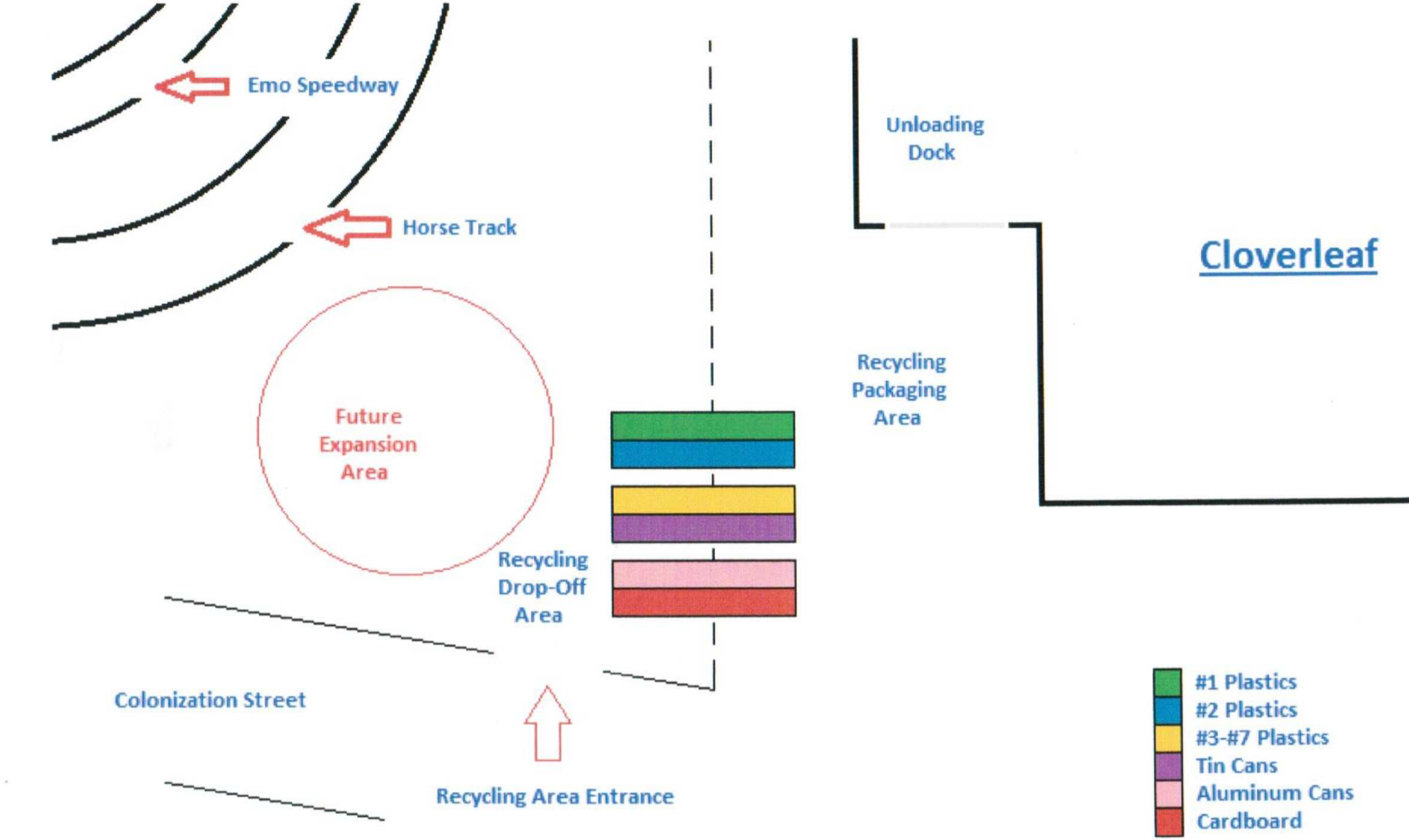
# Appendix F

## Cost Estimate Pricing For Alternative 3

Estimated Costs for Cloverleaf Grocery Recycling Depot

| | |
|---|---|
| 8 HOURS X 85.00 - HOE - PREP (SUBEX + CLEAN DITCH ETC) | 680.00 |
| 3 - 7m X 450mm culverts @ 58.00/m | 1218.00 |
| 2 - 450mm collars + bolts @ 47.00 ea | 94.00 |
| 1200 yds B - GRAVEL (PIT RUN) @ 10.00/yd | 12000.00 |
| 200 yds A - GRAVEL (CRUSHED 5/8) @ 16.00/yd | 3200.00 |
| 16 HOURS X 75.00 SPREAD TRACTOR | 1200.00 |
| MISCELLANEOUS COSTS | 1000.00 |
| TOTAL (BEFORE TAXES) | 19,392.00 |




Emo Speedway
Horse Track
Future Expansion Area
Unloading Dock
Cloverleaf
Recycling Packaging Area
Recycling Drop-Off Area
Colonization Street
Recycling Area Entrance
#1 Plastics
#2 Plastics
#3-#7 Plastics
Tin Cans
Aluminum Cans
Cardboard

# Appendix G

## Cost Estimate Pricing For Alternative 4

Estimated Pricing For Recycling Centre Build at Emo Municipal Garage
Baler Quote

PHONE NO (807) 482-2378

| A/R ADDRESS | DELIVERY INSTRUCTIONS | |
|---|---|---|
| EMO MUNICIPALITY | | INVOICE# |
| P.O. BOX 520 | | INV DATE |
| EMO ON P0W 1E0 | | DEL DATE 06/03/11 |
| | | SALES ID RWD |
| | | PO RECYCLE PLANT |
| | | STATUS QUOTE |

| Product | U/M | Qty Ord | Qty Del | Description | Price U/M | Unit Price | Total Price | Loc |
|---|---|---|---|---|---|---|---|---|
| 21016S | EA | 4 | | 2X10 16' #2&BTR SPRUCE | EA | 15.490 | 61.96 | 01 |
| 21008S | EA | 1 | | 2X10 8' #2&BTR SPRUCE | EA | 6.990 | 6.99 | 01 |
| REBAR | EA | 11 | | 15MM/#5 X 6M/20' REBAR | EA | 14.990 | 164.89 | 01 |
| REBAR10 | EA | 30 | | 10MM/#3 X 6M/20' REBAR | EA | 5.990 | 179.70 | 01 |
| 2647700 | RL | 1 | | WIRE, REBAR TIE 3-1/8LB 16GA | RL | 4.790 | 4.79 | 01 |
| WS1270 | EA | 20 | | 1/2"X7" WEDGE ANCHOR | EA | 2.490 | 49.80 | 01 |
| 20416PWF | EA | 5 | | 2X4 16' PWF | EA | 8.590 | 42.95 | 01 |
| 20416S | EA | 10 | | 2X4 16' #2&BTR SPRUCE | EA | 5.970 | 59.70 | 01 |
| 20409S | EA * | 32 | | 2X4 9' STUDS SPRUCE | EA | 3.590 | 114.88 | 01 |
| 20410S | EA | 10 | | 2X4 10' #2&BTR SPRUCE | EA | 3.190 | 31.90 | 01 |
| 20412S | EA | 20 | | 2X4 12' #2&BTR SPRUCE | EA | 3.940 | 78.80 | 01 |
| 716OSB | EA | 24 | | 7/16" OSB SHEATHING | EA | 7.290 | 174.96 | 01 |
| 21220S | EA | 21 | | 2X12X20' S4S | EA | 25.990 | 545.79 | 01 |
| 716OSB | EA | 25 | | 7/16" OSB SHEATHING | EA | 7.290 | 182.25 | 01 |
| 20616S | EA | 5 | | 2X6 16' #2&BTR SPRUCE | EA | 8.620 | 43.10 | 01 |
| REW | EA | 9 | | ROOF DRIPEDGE WHITE 50/CT | EA | 6.990 | 62.91 | 01 |
| 6FW | EA | 9 | | 6" X 10' FASCIA ALUMINUM WHITE 20/CTN | EA | 9.990 | 89.91 | 01 |
| VSW | EA | 9 | | VENTED SOFFIT ALUMINUM WHITE 12/CTN | EA | 19.990 | 179.91 | 01 |
| CRW | EA | 8 | | CHANNEL RUNNER WHITE 12' | EA | 5.790 | 46.32 | 01 |
| 2169525 | BX | 1 | | SCRWS, SOFFIT WHT HB6X1-1 /2100B | BX | 8.990 | 8.99 | 01 |
| TYPARSR | EA | 1 | | TYPARSR SURROUND ROOFING UNDERLAYMENT 45"X267' | EA | 119.990 | 119.99 | 01 |
| TRGA | LF * | 515 | | TUFF RIB METAL ROOFING GALVALUME | LF | 2.850 | 1467.75 | 01 |
| UPX | EA * | 8 | | GALVANIZED BASE FLASHING | EA | 14.990 | 119.92 | 01 |
| MJG | EA * | 13 | | METAL J-CHANNEL GALV | EA | 12.990 | 168.87 | 01 |
| OSCMG | EA * | 2 | | OUTSIDE CORNER METAL GALV | EA | 25.990 | 51.98 | 01 |
| TFGA | EA * | 4 | | TRANSITION FLASHING GALVANIZED | EA | 39.950 | 159.80 | 01 |
| 1MSG | BAG* | 3 | | 1" METAL SCREW GALV | BAG | 35.000 | 105.00 | 01 |
| UPX | EA * | 1 | | NAIL ALLOWANCE | EA | 100.000 | 100.00 | 01 |

| | |
|---|---|
| NET BALANCE | 4423.81 |
| TOTAL GST/HST | 575.10 |
| TOTAL PST | .00 |
| TOTAL | 4998.91 |

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JUN 0 3 2011
TWP. OF EMO

+ 9 yds concrete (12 yds) $990

PHONE NO (807) 482-2378

| A/R ADDRESS | DELIVERY INSTRUCTIONS | |
|---|---|---|
| EMO MUNICIPALITY | | INVOICE# |
| P.O. BOX 520 | | INV DATE |
| EMO ON P0W 1E0 | | DEL DATE 06/03/11 |
| | | SALES ID RWD |
| | | PO RECYCLE PLANT |
| | | STATUS QUOTE |

| Product | U/M | Qty Ord | Qty Del | Description | Price U/M | Unit Price | Total Price | Loc |
|---|---|---|---|---|---|---|---|---|
| 60616G | EA | 7 | | 6X6 16' GREEN TREATED | EA | 44.990 | 314.93 | 01 |
| 1212S | EA | 4 | | 12" X 12' SONOTUBE WAXED | EA | 36.990 | 147.96 | 01 |
| 2611616 | EA * | 7 | | CAP, BASE BIGFOOT FOOTIN G FORM | EA | 14.990 | 104.93 | 01 |
| 20410S | EA | 30 | | 2X4 10' #2&BTR SPRUCE | EA | 3.190 | 95.70 | 01 |
| 20408S | EA | 30 | | 2X4 8' #2&BTR SPRUCE | EA | 2.690 | 80.70 | 01 |
| 21020S | EA | 8 | | 2X10 20' #2&BTR SPRUCE | EA | 19.990 | 159.92 | 01 |
| 21010S | EA | 2 | | 2X10 10' #2&BTR SPRUCE | EA | 9.530 | 19.06 | 01 |
| 21220S | EA | 21 | | 2X12X20' S4S | EA | 25.990 | 545.79 | 01 |
| 716OSB | EA | 25 | | 7/16" OSB SHEATHING | EA | 7.290 | 182.25 | 01 |
| 20616S | EA | 5 | | 2X6 16' #2&BTR SPRUCE | EA | 8.620 | 43.10 | 01 |
| REW | EA | 9 | | ROOF DRIPEDGE WHITE 50/CT | EA | 6.990 | 62.91 | 01 |
| 6FW | EA | 9 | | 6" X 10' FASCIA ALUMINUM WHITE 20/CTN | EA | 9.990 | 89.91 | 01 |
| VSW | EA | 9 | | VENTED SOFFIT ALUMINUM WHITE 12/CTN | EA | 19.990 | 179.91 | 01 |
| CRW | EA | 8 | | CHANNEL RUNNER WHITE 12' | EA | 5.790 | 46.32 | 01 |
| 2169525 | BX | 1 | | SCRWS, SOFFIT WHT HB6X1-1 /2100B | BX | 8.990 | 8.99 | 01 |
| TYPARSR | EA | 1 | | TYPARSR SURROUND ROOFING UNDERLAYMENT 45"X267' | EA | 119.990 | 119.99 | 01 |
| TRGA | LF * | 515 | | TUFF RIB METAL ROOFING GALVALUME | LF | 2.850 | 1467.75 | 01 |
| UPX | EA * | 8 | | GALVANIZED BASE FLASHING | EA | 14.990 | 119.92 | 01 |
| MJG | EA * | 13 | | METAL J-CHANNEL GALV | EA | 12.990 | 168.87 | 01 |
| OSCMG | EA * | 2 | | OUTSIDE CORNER METAL GALV | EA | 25.990 | 51.98 | 01 |
| TFGA | EA * | 4 | | TRANSITION FLASHING GALVANIZED | EA | 39.950 | 159.80 | 01 |
| 1MSG | BAG* | 3 | | 1" METAL SCREW GALV | BAG | 35.000 | 105.00 | 01 |
| UPX | EA * | 1 | | NAIL ALLOWANCE | EA | 100.000 | 100.00 | 01 |

| | |
|---|---|
| NET BALANCE | 4375.69 |
| TOTAL GST/HST | 568.84 |
| TOTAL PST | .00 |
| TOTAL | 4944.53 |

RECEIVED
JUN 0 3 2011
TWP. OF EMO

+ 2 yds concrete.

# HERCULES Vertical Baler

**Empty your dumpster less and save money with this HERCULES Vertical Baler!**

Environmentally friendly vertical balers can produce dense bales up to 1100 lbs. Easy-to-operate—after waste is loaded into baler, a down stroke ram is activated which holds the waste in place until a light alerts you that there is enough to make a bale. After the bale has been tied, a door opens and ejects the bale onto a pallet for storage until pick-up. 48-second cycle time. These units can bale stretch wrap, cardboard, cans and trash (to properly recycle, each bale must be the same material). 73,502 lbs. of crushing force. 30x48x60" bale. 2600-psi hydraulic system. Meets or exceeds all ANSI Z245.5 standards for bailing equipment. Five-year warranty on structure.

NOTE: Sell baled cardboard product and create a new continual revenue stream! There are several companies that will pay for the baled cardboard. Please contact us to help locate one that will serve your needs.

NOTE: An electrician will need to have electric service prepared for the baler upon delivery. Electrical requirements—3-phase service. Please let us know the input voltage available in your building.

NOTE: Freight charge will include delivery, installation and safe operation training with needed personnel.

**Click the** Price **below to add product to cart.**

| | |
|---|---|
| **Motor HP:** | Seat Material |
| **Motor Description:** | 3-phase |
| **Volts:** | 208/230/460 |
| **Manufacturer:** | HERCULES® |
| **Country of Origin:** | Made in USA. |
| **Overall WxDxH:** | 78x45x143" |

**Product Info**

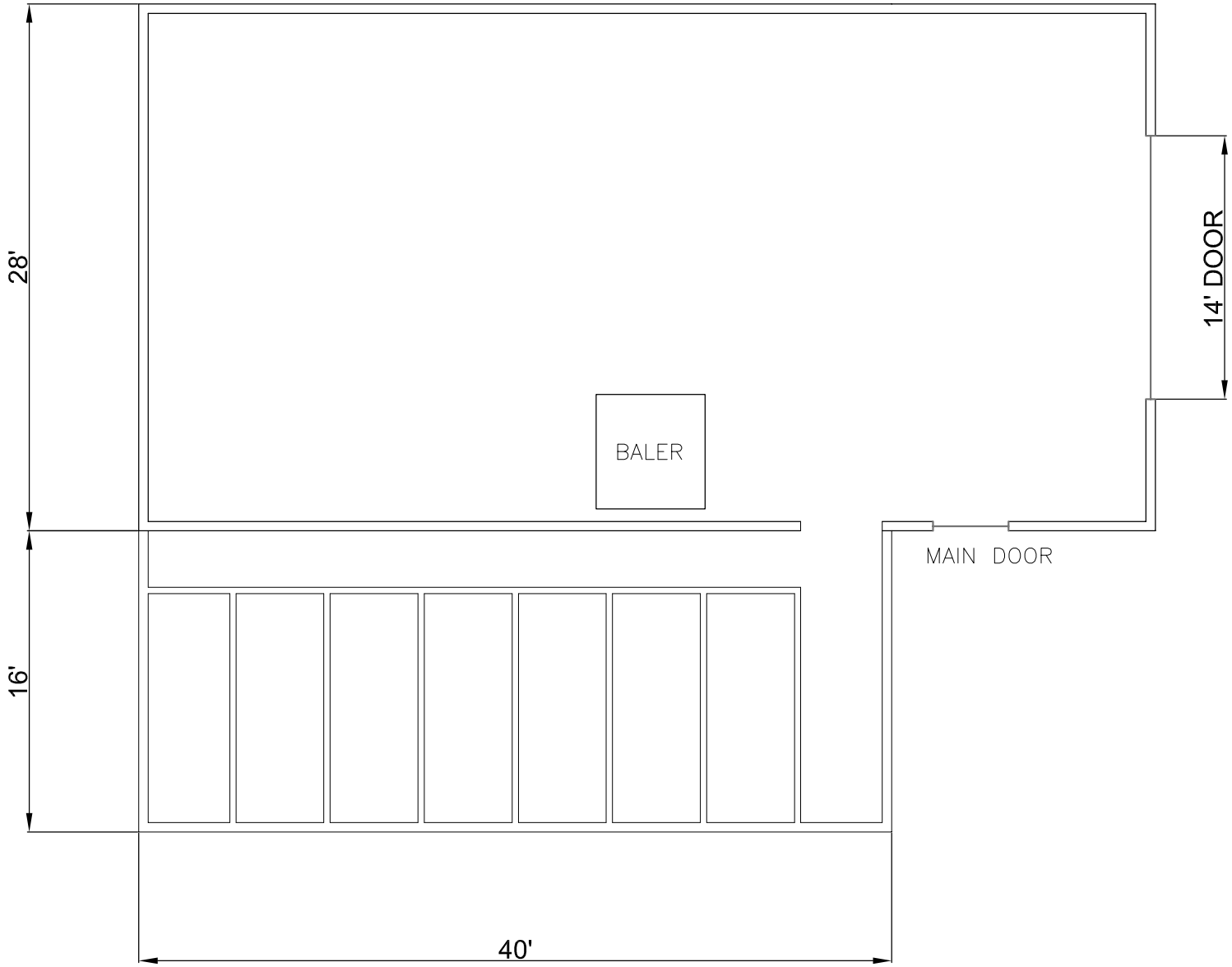
View by product specifications View by Item #

| Item Number | Overall WxDxH | Price |
|---|---|---|
| 3330000 | 78x45x143" | $12,751.00 |

# Appendix H

## Draft Preliminary Design Drawing

FLOORPLAN




NOTES:

CLIENT
Township of Emo

TITLE
Recycling Center

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

| | |
|---|---|
| DRAWN: S.P. | DRAWING NO.: 01 |
| DESIGNED: S.P. | SCALE: NTS |
| DATE: JULY 15, 2011 | ISSUED: JULY 15, 2011 |