City of Hamilton Transfer Stations and Community Recycling Centres

April 2011
Solid Waste Association of North America
Transfer Station Excellence Award
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CITY OF HAMILTON TRANSFER STATIONS AND COMMUNITY RECYCLING CENTRES

APPLICANT
Operations and Waste Management Division
Public Works Department
City of Hamilton
Ontario, Canada

EXECUTIVE SUMMARY
The Operations and Waste Management (O & WM) Division is part of the City of Hamilton’s Public Works Department. The division is responsible for the collection, diversion and disposal of solid and household hazardous waste (HHW) for the City of Hamilton (City).

Since 2005 the number of waste management services and facilities that the City is managing has grown and become more complex as the focus has shifted from the disposal to diversion of solid waste. The genesis in this shift in philosophy is a result of the Solid Waste Management Master Plan (SWMMP) which developed the framework for the future of Hamilton’s waste management system.

As the operations have changed over time the City has had to adapt its way of managing these new waste management services and facilities. Nowhere is this more evident than at the City’s three transfer stations and community recycling centres (CRC).

This award submission will focus on the management of the City’s transfer stations / Community Recycling Centres and the successful transition of contractors in 2010 to a new long term contract. In addition, the award will discuss the physical renovations that took place as part of the contract transition.
BACKGROUND INFORMATION

The City of Hamilton (City) is located on the south-western tip of Lake Ontario covering an area of 278,822 acres (112,835 hectares). Predominately the land base is rural however the majority of the City’s 519,000 residents live within the urban and suburban areas.

Over the past 15 to 20 years the number and types of waste management services and facilities within the City has expanded. The City’s Operations and Waste Management (O&WM) Division is dedicated to providing key services to City residents which includes:

Solid Waste Planning
- Community Outreach & Public Education
- New Program Development

Waste Collection
- Bulk Goods Collection
- Garbage Collection
- Green Cart Collection (Source Separated Organics)
- Leaf and Yard Waste Collection
- Recycling Collection

Recycling and Waste Processing
- Central Composting Facility Operations
- Community Recycling Centre Operations
- Material Recycling Facility Operations
- Transfer Station Operations

Waste Disposal
- Environmental Monitoring Program for Closed Landfills
- Landfill Operations
1.0 FACILITY DESIGN

1.1 Design

1.1.1 Evolution of Transfer Stations into Community Recycling Centres

In the late 1970’s three transfer stations were strategically located throughout the City (formerly the Region of Hamilton-Wentworth). The transfer stations were designed to accept solid waste, top-load it into transfer trailers and transport it to either the City’s incinerator or landfill for final disposal. Up until the late 1990’s waste management was solely centred on the collection and disposal of solid waste through either incineration or landfilling.

In December 2001 City Council approved a new Solid Waste Management Master Plan (SWMMP) which specifically focused on increasing waste diversion rates and minimizing disposal through the development programs and diversion facilities. The adoption of the SWMMP has been instrumental in the development of Hamilton’s long-term waste management strategy.

Based on the recommendations of the SWMMP the first of the City’s three Community Recycling Centres (CRC) was built in 2005 (Mountain CRC) with the subsequent ones (Dundas and Kenora) being constructed in 2006 and 2007 respectively. At each of the sites the physical space allowed for the new CRCs to become integrated into the existing transfer stations. An example of a transfer station / CRC site layout (Mountain) can be found in Appendix A.

Each of the new larger sites was divided into two separate components: the original transfer station, which contained the physical building and the new CRC. The transfer station was dedicated to servicing municipal collection vehicles and most commercial customers while the CRC included a container station for waste and recyclable material disposal and a household hazardous waste depot. The Mountain CRC also contained a Reuse Centre which would provide residents the opportunity to drop-off reusable items and/or shop for reusable items.

Prior to the construction of the CRCs only a limited amount of materials were recycled at the City’s transfer stations. With the City’s original transfer stations evolving into all inclusive waste management centres it provided the City with the means to meet the mandate of the SWMMP which was to increase diversion from landfill. Pre construction of the CRCs the City was limited to diverting four waste types. However, post construction the City had the ability to divert nine different types of waste from landfill.
A comparison of the materials collected pre and post CRC construction is included in Table 2.

### Table 2: Comparison of Materials Collected Pre and Post CRC Construction

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Pre CRC</th>
<th>Post CRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Co-mingle Recyclables</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Leaf and Yard</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Paper / Cardboard</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Household Hazardous Waste</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Tires</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>Electronics</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>Wood</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>White Goods</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>Shingles</td>
<td>x</td>
<td>✓</td>
</tr>
</tbody>
</table>

As more services were offered and more waste types were accepted at the transfer stations / CRCs the operation of these facilities became more complex. Historically the City of Hamilton’s waste management facilities were operated by contractors with City staff ensuring the fulfillment of contractual requirements. Up until 2005 each of the three sites were operated under two separate contractors. One contractor was responsible for transfer station operations while the other managed the weigh scales.

Following the construction of the CRC’s the number of contractors required to operate the Mountain site increased from two to five while the number of contractors at the Dundas and Kenora site increase to four. Each of the following areas was managed by a separate contractor:

- Transfer station operation – disposal at transfer stations and transport to landfill;
- CRC operation - supplying 40 yard roll-off containers, switching and transporting full containers to off-site recycling facilities, providing direct customer service and monitoring of container stations (Photo 1);
- Household hazardous waste depot (HHW) operation;
- Weigh scale operation – on both the transfer station and CRC portions of each site; and
• Reuse Centre operation (Mountain only).

Due to the number of contractors involved, this format became increasingly difficult for the City to manage and for the site contractors to work with each other. In order to facilitate a more conventional management and site operational structure the City synchronized the transfer station, CRC and Reuse Centre operation contracts that were set to expire at the end of 2009. By not extending these three contracts beyond 2010, the City was able to issue a Request for Proposal (RFP) for these services to be administered by one contractor following their expiration in 2009. However, since the household hazardous waste depot requires specialized contractors and the City wanted to retain control of the weigh scales as billing is based on tonnage, these contracts could not be synchronized with the new contract.

As part of the contract specifications the following activities were required:
• Receive both recyclable and waste materials;
• Store and transport all received materials to appropriate recycling and disposal facilities;
• Maintain sites including snow removal / landscaping, on-site traffic control, etc.;
• Provide all required labour, equipment, tools and vehicles to complete the work;
• Manage personnel, maintain equipment and buildings, direct and load materials for transport; and
• Marketing of all recyclable materials.

The RFP was issued in May 2008 and closed in June with the City receiving six submissions. Following an extensive technical evaluation BFI Canada Inc. (BFI) was selected as the successful proponent in late 2008. A formal contract was executed between BFI and the City in the spring of 2009 and operations began with BFI on January 1, 2010.

As a result of the new contract the number of contractors on-site was scaled back from five to three at the Mountain and two at Dundas and Kenora with BFI operating under the new contract and two smaller, specialized contractors completing specific parts of the operations - Sheprott Security is responsible for all weigh scale operations and Hotz Environmental Services, a leader in hazardous waste management, manages the HHW depots at each of the three sites.
1.2 Merits of the Facility / Operations

There are a number of operational advantages by having the site, with an exception of the specialized services, operated by one main contractor. These include the following:

**Facility Management** – Reducing the number of on-site contractors has allowed the City to more effectively manage the sites and therefore operate more efficiently. City staff are no longer required to manage and co-ordinate five contractors, allowing staffing resources to focus on other City programs. Minimizing the number of contractors is also a risk management issue that was identified as a key goal for the City.

**Reduced Number of City Staff** – Operations are currently managed by two City Contract Technicians which makes the management of these operations extremely efficient from a City staffing perspective. By effectively managing the transfer stations / CRCs with a minimal number of staff it allows the City to devote staff resources on program development and implementation which is key to achieving the City’s waste diversion goals.

**Improved Contractor Service Level** – During the previous contract there was one contractor supervisor that was responsible to manage all 3 sites. With the new contract there is one contractor supervisor at each of the three sites that reports to the City’s staff resulting in more effective operations.

**Responsibility** – One contractor is responsible for approximately ninety percent of the site operations. As mentioned, the responsibility was more distributed under the previous contract which at times resulted in an overlap in some areas such as health and safety. Under the new contract there is very limited overlap between contractors.

**Experts** – The contractors that the City has contracted to operate the City’s transfer stations / CRC’s offer knowledge, expertise and experience from their operations throughout North America which can be drawn upon to improve the City’s operations. BFI is a recognized North American leader in the waste management industry while Hotz Environmental Services Inc. is the leading Ontario company in hazardous waste management.

**Resources** – A large company such as BFI has the ability to call upon and procure resources quickly when required. In the event of an influx of recycling or waste materials BFI has the appropriate resources to ensure that the materials are properly recycled or disposed. Additionally, BFI can realize economies of scale that the City would not necessarily receive such as the purchasing of rolling stock.
1.2.1 Transfer Station Renovations

Since the original construction of the transfer station buildings in the 1980’s the employee and public amenity areas had not been upgraded or refurbished. The washrooms, kitchen, lunchroom areas and offices had seen 30 years of very hard wear and tear. Additionally, recent changes were made in legislation and the Ontario Building Code which require that facilities incorporate features to assist people with disabilities. The City of Hamilton embraced this initiative and in addition to a complete makeover of the support facilities at the transfer stations the stations were upgraded to be handicap accessible to coincide with the start of the new contract. The City also used this refurbishment opportunity to institute efficient fixtures, lighting and heating/cooling equipment.

- Barrier free showers for both men and women (Photo 2);
- High efficiency water fixtures;
- Handrails in hallways;
- Wheelchair accessible washrooms;
- Automated door openers; and
- High efficiency heat recovery systems.

The “made-over” washrooms, kitchens/ lunch rooms/ offices all incorporate a barrier free and energy/water efficiency philosophy

1.3 Innovative / Unique Aspects / Different From Rest

Operations
- The City of Hamilton is one of the only large Ontario municipalities whose transfer stations / CRC facilities are exclusively operated by contractors. All aspects of the operations are conducted by a contractor;
- Only two City staff are required to manage three sites; and
- Contractual specifications require that the contractor of the transfer stations / CRCs install a Closed Circuit Television (CCTV) system at all three sites. This allows for both City staff and the contractor to monitor the sites more effectively and to identify and respond to issues quickly.
Tipping Floors

Similar to the amenity areas of the Transfer Stations the tipping floors at each station were in poor condition from the day-to-day wear and tear of heavy equipment over the last 30 years. The reinforced steel that made up the floor was showing through in many areas and the concrete surfaces had been severely eroded. There are many products available to incorporate wear resistant toppings and coatings specifically for tipping floors to reduce the amount of wear and allow the floors to last longer. However, the cost of these products is extremely high and the service life is dependent on the installation technique and site operating conditions. The City concluded, that the lowest life cycle cost approach to tipping floor design is to not use any additional hardeners or toppings but rather to design the floors so that high wear sections can be readily replaced as wear occurs. On-going monitoring and prompt repair of damaged areas is the City’s operating philosophy to achieve maximum life and lowest cost for the tipping floors.

Spring Rush

During the “Spring Rush” it has not been uncommon in the past for up to 1500 hundred customers to visit any one of our sites in one day. In previous years this has occurred following the final snow melt allowing resident the opportunity to clean out their basements and garages of the material that they have accumulated and collected during the previous calendar year. In response to customer requests the City hires police officers to maintain traffic control at the sites during the busiest spring weekends. This is an additional cost to the City, however the City endures the cost to ensure efficient operations and the continued participation in the City’s waste management programs.

Reuse Center

In 2005 the City established a relationship with Community Living Hamilton (CLH) to operate the Reuse Centre, located at the Mountain CRC (Photo 3). With the synchronization of the Reuse Centre operations with the transfer station and CRCs the contract with CLH was to expire at the end of 2009. However, as part of the new contract, BFI hired CLH as a sub-contractor to continue to operate the Reuse Centre. At the Reuse Centre CLH provides mentally challenged adults employment. The response from customers who drop off reusable items and/or shop at the Reuse Centre has been extremely positive and continues to exceed the City’s expectations. The Reuse Centre is an excellent example of how the public can provide support for the environment while simultaneously helping their local community.
2.0 ENVIRONMENTAL CONTROL and REGULATORY COMPLIANCE

2.1 Environmental Protection

A number of environmental protection initiatives were introduced as part of the new contract with BFI. One of the key environmental considerations was the type of transfer trailer to be used for the hauling of waste from the transfer station to the City landfill. In order to allow for a greater payload, resulting in fewer trips to the landfill and a reduction in emissions, fifty two foot trailers that were lightweight, aluminum bodied with a walking floor were selected.

Examples of some additional key environmental protection initiatives as part of the new contract include the following:

- Regularly scheduled litter control;
- Requirement for mandatory tarps on transfer trailer vehicles and on roll-off container trucks;
- Installation of an odour suppression system to reduce and eliminate any odours emanating from the various waste types;
- Ensuring transfer station doors are closed when not in use to prevent odours and litter from migrating out of the building;
- Operations vehicles are not permitted to idle thus reducing emissions;
- Roll-off containers are emptied by the end of each working day to reduce odours and vermin on-site or if they cannot be emptied they are tarped;
- Transfer station tipping floors have fully enclosed drains to prevent any migration of liquids into the sewer system;
- The entire site is paved to prevent dust migration and assist with dust control; and
- Through the CCTV system City staff are able to monitor operations remotely reducing the need to drive to each of the sites.

2.2 Overall Impact of the Program

The overall impact of the program on human health, environmental quality and resource conservation has been positive. The renovations to the transfer stations with increased accessibility allow for the facilities to be used by a greater number of people. This is especially important as it will allow for employment opportunities to people who may have otherwise been unable to work in a waste management environment due to facility accessibility.
2.3 Compatibility with the Environment

The design features and operational controls at the City’s transfer stations and CRCs minimize the impact on the surrounding environment. Locating the new CRCs adjacent to the existing transfer stations made it possible for the City to maximize the effect of the design features of the facilities to the overall benefit of the environment.

2.4 Environmental Compliance

The Ontario Ministry of Environment (MOE) conducts regular inspections and monitoring of the transfer stations and CRCs. To date the MOE has not identified any compliance issues and the facilities continue to be in regulatory compliance.

2.5 Awards

In 2005 (Mountain CRC) and 2007 (Dundas and Kenora CRC) respectively received awards from the Ontario Public Works Association (OPWA). In both award submissions the CRCs won the award for the Public Works Project of the Year in the $2 – 10 million category. In 2007 the City received the Silver award from SWANA in the Transfer Station Excellence category.

3.0 PROGRAM PLANNING

3.1 Planning Process

3.1.1 Operations

At the time that the SWMMP was adopted in 2001 the City was in the midst of a ten year contract with the incumbent contractor who operated the City’s transfer stations. As the CRCs were constructed and integrated into the transfer station operations the City had to plan for the most effective way of carrying out the new operations. For that reason the decision was made that the CRC operations would be separately contracted until 2009 when they could be synchronized with other operational contracts.

The City understood that having a large number of contractors operating the sites was not an ideal situation and realized as early as 2004 that a new large scale service contract would be the best solution to manage the transfer stations / CRCs. The contract would be strategically structured so that a single main contractor would be responsible for the entire or majority of the operations, giving exception to the Reuse Centre and HHW depots.
To allow for appropriate timing to prepare, issue and award a Request For Proposal (RFP) a Transfer Station and Disposal Review process began in the late fall of 2007. Leading up to the development of the RFP there were several key guiding principles which the planning process needed to address:

- The contract was to be based on operating all aspects of the sites. Operation of site weigh scales and household hazardous waste depots was excluded and retained by the City. The household hazardous waste contractor is for a specialized service while the City wanted to retain control of the weigh scales since billing is based on tonnages;
- As part of the planning process a best practices exercise was undertaken which discovered that the haulage of recyclables and waste from the sites should be conducted by the same contractor operating the sites;
- The contract was to be all-inclusive, composed of both operations and maintenance; and
- The contractor would be responsible for the marketing of the non-City owned recyclables including: electronics, metal, tires, shingles, white goods and wood. Revenue sharing would be included in the contract so that the City would receive a portion of any revenues that the contractor would gain from the sale of the noted recyclables.

After months of preparation the RFP was issued in May of 2008 with a closing date in late June of 2008. Technical evaluations of the six submissions took place in July. Following an extensive evaluation BFI was selected as the successful proponent in late 2008.

### 3.2 Facility Downtime

**Contract Transition**

Following the RFP evaluation process BFI was awarded a ten year contract to operate the transfer stations / CRCs. A key consideration during the planning process was to ensure a smooth transition from the old contract to the new one. The contract transition was to occur overnight - from New Year’s Eve 2009 to New Year’s Day 2010! The timelines were extremely short since December 31, 2009 was a working day at all of the sites. New Year’s Day 2010 was a holiday however full operations resumed on January 2nd. In preparation of the contract transition a number of actions were undertaken by the City:

- A dedicated contract transition person was hired in March 2008. They were responsible for ensuring that all contract requirements were completed as per the identified dates in the contract. In addition, they planned all of the transition activities and implemented a software program to track and manage the daily, monthly and annual contractual responsibilities to be completed by the City and BFI;
• Meetings were organized three months in advance of the contract transition in order to begin transitioning the co-ordination. One month prior to the transition meetings occurred on a weekly basis;
• In September 2009 City staff were scheduled to work on December 31st to ensure there was adequate coverage. Two City staff were stationed at each site with a Supervisor co-ordinating all activities on all three sites.
• The contract required the new contractor to procure all of the required equipment and hire staff prior to start-up. A few weeks prior to the transition date BFI began staging some of their equipment such as the approximately twenty 40 yard roll-off bins that were contractually required at each site. Rolling stock (i.e. front-end loaders and transfer vehicles and trailers) were delivered to the site after closing on the 31st.

As a result of nearly eight months of pre-planning there was no downtime at any of the three sites. BFI took over on January 1st, 2010 and the sites were open to accept waste from site users on January 2nd. Evidence that the transition was effective is the fact that the City did not receive a single complaint, comment or experience any negative issues. To site users (public and collection crews) it was business as usual.

Tipping Floor Replacement

The replacement of the tipping floors required the complete shut-down of each of the three stations as use of the tipping floor was required for facility operations. Stations were shut down one at a time to ensure that there were always two facilities in operation. However, the shutting down of one of the three stations put a large burden on the remaining two stations and created logistical difficulties for curbside waste collection. An innovative bonus/penalty system was instituted to encourage the tipping floor replacement contractor to minimize the time that the tipping floors were shut down. It was determined that 28 consecutive days was a reasonable amount of time for the contractor to complete each floor replacement. Conceptually, one week for removals, one week to prepare the reinforcing steel and place the slab and two weeks to allow sufficient curing (cylinders were cast for breaking to ensure adequate concrete strength).

The cost to the City to use two transfer stations for daily operations instead of three was estimated to be approximately $2,000 per day. The contract allowed for a $2,000 per day bonus for every day less than 28 days that the station could be reopened. The contract also stipulated a $2,000 per day penalty for every day more than 28 days that the station could not be reopened because either the work was incomplete or the concrete had not attained sufficient strength. With this innovative bonus/penalty system the tipping floor replacement contractor completed all of the tipping floors in less than 28 days each. In fact, the total tipping floor replacement for all three sites was 33 days less than originally anticipated. Although the bonus paid to the contractor resulted in no monetary cost savings to the City, it did result in minimizing
the stress on the system operating with only two stations and avoided over a month in “upset” conditions to the City and waste contractors.

4.0 PERFORMANCE, ECONOMICS AND EFFECTIVENESS

4.1 Operational Efficiency

During the planning process it was vital to consider how performance could be maximized. The City was focused on service delivery for the customers of these sites. There are several ways in which efficiencies were realized:

Contractor to City Staff Ratio – On a weekly basis approximately ninety staff are required to operate the City’s three transfer stations / CRCs. All of this is managed by two City Contract Technicians, a ratio of 45 contractors to 1 City staff. This is significant considering the number of customers served and tonnages processed at the City transfer stations / CRCs in 2010;

Reduction in Site Contractors - As mentioned previously operational efficiencies were realized from a management standpoint. By reducing the number of contractors this has allowed the City to more effectively manage the sites;

Number of Site Supervisors – In the previous contract one contract supervisor managed all three transfer stations and haulage of the waste materials to landfill. Under the new contract there are three supervisors (one per site) and one contract manager. This is a 400% increase in contractor management which has led to more streamlined and effective operations.

Contracted Site Staff – During the previous contract there were a total of four staff per site however that number has risen to six with the new contract.

4.2 Operational Performance

During the first year of operation the new contract met all goals that were identified at the beginning of the planning process. As outlined in Table 1 a similar amount of total waste was processed through the sites in 2010 compared to 2009 with a greater level of customer satisfaction.

Over the last five years the total tonnage generated by the City has continued to decrease while the annual diversion rate has steadily risen (Table 1).
Table 1: Comparison of Waste Generation and Diversion Rates

<table>
<thead>
<tr>
<th>YEAR</th>
<th>TONNES (tonnes)</th>
<th>DIVERSION RATE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>478,000</td>
<td>49</td>
</tr>
<tr>
<td>2009</td>
<td>491,000</td>
<td>47</td>
</tr>
<tr>
<td>2008</td>
<td>503,000</td>
<td>47</td>
</tr>
<tr>
<td>2007</td>
<td>525,000</td>
<td>42</td>
</tr>
<tr>
<td>2006</td>
<td>558,000</td>
<td>36</td>
</tr>
</tbody>
</table>

A key indicator to operational performance is the number of complaints received by the City from both customers and nearby residents. There was a 500% decrease in the number of complaints received by the City in 2010 compared to 2009. In both years the complaints revolved around odour management. This is important to the City to ensure that the facilities continue to be good neighbours and be an accepted part of the community.

4.3 Customer Service

The City is very proactive in addressing the concerns of transfer station / CRC customers. A significant portion of the transfer station / CRCs designs are based on addressing the needs and concerns that were identified by customers during consultation. In all aspects the City has attempted to make the system as user friendly as possible. The Waste Reduction Task Force (WRTF), comprised of members of the public, meet monthly with O & WM staff to discuss how the City’s programs are carried out and work in unison to identify areas where the City’s programs can be improved.

At the City there are two levels of customer service. The first level is the customer contact centre, which receives all public enquiries for the entire City, providing residents with a single number to inquire about any programs including waste management. The second level is a waste management customer support group to address calls which require additional follow-up. All calls are tracked using an electronic system (Hansen). Any follow-up actions are recorded in a GIS database to confirm service issues have been addressed.

On-site attendants assist customers visiting the transfer stations / CRCs. Attendants answer user questions, inform them of the different services offered, notify users on what materials are acceptable/unacceptable and assist users with disposing their loads.
### 4.4 Budget

The overall transfer station budget is comprised of the operating budget and generated revenues. A summary of the comparison for budgeted and actual budgets during 2009 and 2010 is found in Table 3.

**Table 3: Comparison of Budgeted and Actual Budgets during 2009 and 2010.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Budgeted</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>$6,911,970</td>
<td>$7,326,414</td>
</tr>
<tr>
<td>2010</td>
<td>$6,336,952</td>
<td>$6,222,805</td>
</tr>
</tbody>
</table>

As demonstrated the City received a greater level of service for less cost in 2010. In fact the operations came in $114,000.00 below budget.

In 2010 the revenues generated at the transfer stations / CRCs was greater than budgeted by 18%. Of that amount $123,000.00 was accounted for by the sale of marketed materials by BFI.

### 5.0 UTILIZATION OF EQUIPMENT / TECHNOLOGIES

#### Equipment

As part of the City’s best practices review the City determined that existing equipment and technologies at the transfer stations / CRCs were operationally efficient and effective. As a result, some existing equipment has been employed at the transfer stations / CRC’s and consists of the following:

- 30 and 40 yard roll-off containers;
- 40 yard roll-off trucks to transport waste/recyclables from the CRCs; and
- Hand-held odour suppression system.

New equipment added as part of the new contract includes:

- CCTV system;
- Caterpillar 950H front-end loaders (five and a half yard bucket) to top load waste into trailers;
- 52 foot, aluminum, thin-walled walking floor trailers which are larger and lighter, allowing for larger payloads; and
• Paradigm (data management software) system to input all relevant collection data e.g. waste type, source of waste, tonnes generated, etc.

Technologies

One small section of the tipping floor at the Mountain Transfer Station was significantly worn. However, the replacement of this area was complicated by the fact that there was a basement located directly underneath. Replacing the suspended slab would have been expensive, complicated and time consuming. It was decided to try to salvage the slab and repair it with a proprietary hardened topping. Although the hardened topping strategy was not used elsewhere on the City’s three transfer station tipping floors, this was viewed as a unique circumstance that could be used as a test case to demonstrate how the product could perform. An area of approximately 140 square feet was repaired using with Anviltop 3000 applied at a thickness of 1 ¼ inches. The repair achieved good immediate results and the surface is performing well.

6.0 WORKER HEALTH AND SAFETY

As previously mentioned the City’s transfer stations / CRCs are operated by one main contractor and two specialized contractors under the new contract. All of the contractors have to abide by the general health and safety policies of the sites and any additional City policies. Contractor meetings are held monthly between the City and site contractors with health and safety as a standing agenda item. These monthly meetings are an opportunity to discuss any recent and/or potential health and safety concerns. Each of the contractors on site have developed their own health and safety policies specific to their work which they are reviewed by the City. As part of all new contracts the City requires contractors to conduct hazard assessments of the City’s sites within the first three months of operation. Additionally there is a condition that the contractors will invite City staff to attend internal contractor health and safety meetings. A benefit of having one main contractor with two other smaller, specialized contractors is that there is no longer any overlap in health and safety responsibility.

BFI is responsible for loading waste from the tipping floor into transfer trailers, transporting waste from the transfer station to the landfill and on-site traffic control and security. They have made health and safety a key priority since any operation is only as good as its health and safety policies and record. BFI’s Safety Activity Monthly (SAM) program is an example of their proactive approach to workplace health and safety. SAM is a corporate initiative which requires BFI personnel to undergo a variety of training each month. Joint health and safety committee meetings are held monthly by BFI. The local BFI office has a dedicated health and safety representative who manages health and safety issues at the transfer stations. In addition, a BFI corporate health and safety representative oversees the local health and safety program.
The City’s waste management sites are regularly audited by the Operations and Waste Management Divisions Joint Health and Safety Committee to ensure that we are operating in compliance of the City’s and governmental safety requirements (Appendix B). City Waste Management staff go through regular health and safety training. All City staff working at any of the three sites are required to wear Personal Protective Equipment (safety shoes and glasses, traffic vest and hard hat).

**7.0 PUBLIC ACCEPTANCE, APPEARANCE AND AESTHETICS**

In the original design of the CRCs there was an emphasis on the facilities to be more aesthetically pleasing to help promote a positive public perception rather than that they are at the “dump”. In order to help achieve this positive image the contractor conducts daily inspections of the grounds and vehicles to ensure that there is no litter, odours, vectors or any other nuisance. Each site is additionally inspected one to three times a week by City staff to ensure that the sites are well kept and that any issues are rectified immediately. In addition, the contractor is required to ensure that site landscaping and snow removal are maintained, roadways are regularly cleaned and swept, and the general aesthetic appearance of the sites is always maintained. BFI has regular maintenance schedule for all of their vehicles. The transfer vehicles are seen by thousands of people daily and must be clean in order to be presentable on the road. City Municipal collection vehicles are also washed weekly to maintain their appearance.

In preparation of the contract changeover a tree planting program was undertaken at the transfer stations / CRCs. In total over eighty trees were planted at all of the sites. Many of the trees were planted along roadways to serve as a natural buffer and to help integrate the sites into the immediate surrounding area.

The City has taken a proactive approach to on-site odours. A hand-held odour suppression system has been introduced which is sprayed on any waste materials that are releasing odours and could potentially affect neighbours. In addition, through good operational practices, BFI is ensuring that odourous materials such as garbage and leaf and yard materials are transported quickly to the City’s landfill or leaf and yard composting facility before they can become anaerobic and emit odours.
At the request of residents the City has installed new color coded signs to help the public easily find where they need to go once they are at a site. In 2010 an electronic message board was installed at the Mountain Community Recycling Centre as a pilot program as this location is the busiest site and the City wanted to have the ability to notify customers of any news, updates or messages.

**Photo 4.**

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**CONCLUSION**

The City of Hamilton has successfully updated and significantly improved its waste management system while maximizing reuse of its existing facilities. A complex and unwieldy system of contractors undertaking a variety of tasks at each of the City’s sites was seamlessly streamlined to a simple and clear structure that is cost effective, provides a very high level of service and minimizes risk to the City. In addition, three tired transfer stations that were at the end of their service life were refurbished and upgraded to offer the City many more years of service. The improvements at the transfer stations have the benefits of allowing the City to engage a diverse workforce at the facilities including persons with disabilities and to help the environment through design features that minimize the use of resources and energy.
APPENDICES

APPENDIX A – MOUNTAIN TRANSFER STATION / CRC SITE LAYOUT
APPENDIX B – HEALTH AND SAFETY INSPECTION FORM