



APPENDIX E

Materials Recovery Facility Design and Operations



December 2014

APPENDIX E

Materials Recovery Facility Design and Operations Volume IV Design and Operations Report Capital Region Resource Recovery Centre

REPORT



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1.0 INTRODUCTION

This appendix to the Design and Operations (D&O) Report has been prepared to describe the proposed materials recovery facility (MRF), a waste processing facility that is a component of the Capital Region Resource Recovery Centre (CRRRC). This appendix should be read in conjunction with the D&O Report for the complete CRRRC Site that is Volume IV of the document package. The D&O Report has been prepared to support an application for approval under the *Environmental Assessment Act* (EAA) (MOE, 2010a), and also for subsequent approvals under the *Environmental Protection Act* (EPA) (MOE, 2010b) and *Ontario Water Resources Act* (OWRA) (MOE, 2011) in support of the application for an Environmental Compliance Approval (ECA) for the CRRRC.

The proposed MRF will have a total footprint of approximately 13,000 square metres. It is anticipated that processing of waste materials from the industrial, commercial and institutional (IC&I) waste stream will be carried out at the MRF to separate out and recover a variety of materials, generally consisting of cardboard, paper, glass, plastics, ferrous and non-ferrous metals, wood and other fibres. Rejected and residual materials will be hauled to and disposed of in the on-Site landfill.

This D&O Report has been prepared to describe the design of the facility and the on-Site operations, which include the following activities:

- The receipt and processing of a maximum of 800 tonnes per day of IC&I waste;
- The receipt and processing of a maximum of 199,680 tonnes of IC&I waste annually;
- A maximum storage quantity of 850 tonnes of unprocessed IC&I material at any one time;
- Receiving hours of 6:00 a.m. to 6:00 p.m., Monday to Saturday; and,
- Operating hours of 7:00 a.m. to 11:00 p.m., Monday to Saturday.

The D&O Report has been prepared in accordance with the Ministry of the Environment and Climate Change (MOECC) Guide to Applying for an Environmental Compliance Approval (MOE, 2012).

1.1 Regulatory Requirements

Waste processing sites are subject to Part V of the EPA (MOE, 2010b). Section 27 of the EPA requires that an ECA be obtained from the Director of the MOECC for the establishment, operation, alterations, or enlargement of a waste processing site.



2.0 FACILITY DESIGN

2.1 Function of the Materials Recovery Facility

The function of the MRF is to receive and process solid, non-hazardous waste from the IC&I waste sector. Recovered materials will be sent to off-Site markets or utilized as a bulking agent in the organics processing facility, and rejected and residual materials will be hauled to the on-Site landfill.

Waste will be deposited on the receiving floor of the MRF (mixed loads and source separated loads will be deposited separately), sorted, baled, and then loaded into trucks or tractor trailers to be hauled off-Site to end markets, to the organics processing facility or to the on-Site landfill.

2.2 Facility Layout

Figure 1 shows the proposed plan of the MRF area and Figure 2 shows the proposed layout of the MRF building. The MRF will be developed as part of the initial Site development, and is located in the north portion of the Site, adjacent to the construction and demolition (C&D) processing facility.

The MRF will consist of a slab-on-grade industrial building with a footprint of approximately 13,000 square metres, and a height in the range of 13 to 14 metres, which will consist of:

- Approximately 3,000 square metres designated for the receipt of waste;
- Approximately 6,000 square metres designated for processing of waste;
- Approximately 700 square metres of office/employee space; and,
- Approximately 4,000 square metres designated for the storage and loading of products of the process.

Doors on the south wall of the building will be used for receiving and shipping of incoming and outgoing materials. A door(s) located on the north wall will be used infrequently to service equipment. The offices and employee facilities, including employee parking, will be on the north side of the main buildings.

The building will house the diversion equipment and processing activities. The MRF building will be heated by heat recovered from the flare/generator or a biogas boiler or via a backup fuel oil heating system.

The building will be equipped with a dust collection system that will discharge through a bag house and cyclone with the air vented through the roof. The air ventilation rate is estimated to be 403,000 cubic feet per minute. The air change rate in the receiving area is estimated to be 6 changes per hour, 3 changes per hour in the processing area, and 0.5 changes per hour in the office/employee space.

Water collected by floor drains in the MRF will accumulate in underground holding tanks. The water will be removed with a vacuum truck for off-Site treatment or be delivered to the on-Site leachate pre-treatment facility.



2.3 Truck Traffic

There is sufficient queuing capacity on the access roads at the Site to allow for vehicles entering and exiting the CRRRC Site.

The MRF's design is to accept up to 199,680 tonnes of IC&I waste per year for processing. Based on shipping and receiving 6 days per week, the corresponding number of trucks will depend on the size of trucks dropping off IC&I material at the MRF, and the size of trucks hauling recovered materials off-Site, or rejected and residual materials to the landfill.

2.4 Wastes Accepted at the Site

2.4.1 Waste Characterization

The MRF will be used to recover materials from mixed and source separated loads of waste from the IC&I sector.

2.4.2 Waste Quantities

The MRF will have the capacity to process approximately 50 tonnes per hour of IC&I waste, or approximately 800 tonnes per day. The maximum amount of IC&I waste to be accepted at the MRF is 199,680 tonnes per year. It is estimated that overall diversion of IC&I material received at the CRRRC Site will range from approximately 11 to 26%; it is estimated that approximately 50% of IC&I materials received at the MRF will be recovered.

2.5 Waste Storage

Waste will be stored in accordance with Section 3.3.2 of the Ontario Fire Code (MCSCS, 2007), which stipulates the requirements for indoor general storage of combustible or non-combustible solids. Since the building has a sprinkler system the storage of waste will comply with the following:

- The area of individual storage piles will not exceed 1000 square metres;
- The clearance between sprinkler head deflectors and the tops of piles shall not be less than 457 millimetres; and,
- Aisles separating storage piles will be a minimum width of 2.4 metres extending the length of each storage pile.

The maximum amount of unprocessed waste to be stored at one time is 850 tonnes, which will be confined to the waste receiving and storage area as indicated on Figure 2. The maximum amount of processed materials to be stored at one time is 1,680 tonnes.

2.6 Closure Plan

The MRF will be decommissioned and closed prior to a change in use or sale of the property. A closure plan will be completed at least six months prior to Site closure.

The decommissioning and closure of the MRF will include the following procedures:

- All IC&I material storage areas will be emptied and the waste sent for disposal;
- All equipment will be either sold or reused at another facility;
- All floors will be swept and, if necessary, power washed and any wastewater would be collected and disposed in accordance with *Ontario Regulation (O. Reg.) 347* (MOE, 1990); and,
- The exterior portions of the MRF area will be cleaned of any litter.



3.0 FACILITY OPERATIONS

3.1 Description of On-Site Operations

Inbound vehicles with IC&I waste material will enter the Site from Boundary Road and will proceed to the weigh scale. While vehicles are being weighed, the weigh scale operator will obtain and record information such as the source and description of the waste and the ECA number of the hauler. If, after inspection, the mixture of waste contained in the incoming load is suitable for processing, the vehicle driver will be directed by the weigh scale operator to the receiving area of the MRF, where the vehicle will unload into the storage area as directed by a MRF employee. If, after inspection, the mixture of waste contained in the incoming load is unsuitable for processing, the vehicle will be sent directly to the landfill for disposal. After unloading as directed, the empty vehicle will exit the Site.

Incoming vehicles from the scale containing materials destined for the MRF and vehicles transferring bins from the small load drop-off will enter the MRF building along the west part of the south side of the building and unload onto the floor; clean (source separated) loads will be kept separate from mixed loads. Larger recoverable or reject items will be manually sorted out of the incoming material. The incoming materials will then be loaded into a system of processing equipment that includes both mechanical recovery (ballistic separators, screens, magnets, air sorters and optical sorters) and manual sorting of materials. The operational flow chart for the MRF is shown on Figure 3. The recovered materials will generally consist of cardboard, paper, glass, plastics, ferrous and non-ferrous metals, wood and other fibres. The recovered materials will be baled and stored, and then loaded onto trucks along the eastern part of the south side of the building and hauled off-Site to end markets. Rejected and residual materials will be loaded onto trucks within the east end of the building and hauled for disposal in the on-Site landfill.

3.2 Hours and Days of Operation

The MRF will operate between the hours of 7:00 a.m. and 11:00 p.m., Monday through Saturday. Waste will be received at the CRRRC between the hours of 6:00 a.m. and 6:00 p.m. The Site is expected to operate between 300 and 312 days per year.

3.3 Material Balance

A material balance for the MRF is provided on Figure 4. The maximum processing capacity of IC&I waste at the MRF is 800 tonnes per day, to a maximum of 199,680 tonnes per year.

Of the IC&I material received at the MRF for processing, it is estimated that over time, up to 50% will be recovered during operations. Recovered materials will be sent to off-Site markets or used as a bulking material in the organics processing facility.

The remaining material not recoverable from operations at the MRF will be disposed in the on-Site landfill.

3.4 Waste Receiving Sites

Waste residuals from the MRF will be sent to the on-Site landfill.



3.5 Facility Equipment and Maintenance

The MRF operation will utilize the following equipment:

- Ford F-150 4x4 pickup truck;
- TwoCaterpillar 966 loaders;
- Two open top 120 cubic yard trailers;
- Caterpillar 2C6000 forklift;
- Caterpillar 246 skidsteer;
- Shunt tractor (shared with C&D processing facility)
- Magnets;
- Shredder;
- Conveyors;
- Screens;
- Ballistic Separators;
- Air Sorter; and,
- Optical Sorters.

Note that all models are presented above on an “or equivalent” basis.

A preventative maintenance program will be followed for each piece of equipment based on manufacturer specifications.

3.6 Staff Training

A training plan will be developed and maintained for all employees that operate the MRF. Trained personnel will supervise all receiving of waste at the MRF. All employees directly involved with activities relating to the facility will be trained in the following:

- Relevant waste management legislation, regulations and guidelines;
- Major environmental concerns pertaining to the waste being handled;
- Occupational health and safety concerns pertaining to the processes and waste to be handled;
- Management procedures including the use and operation of equipment for the processes and waste to be handled;
- Environmental emergency and contingency procedures for the processes and waste to be handled;
- The use and operation of the equipment to be used by the operator;



- Procedures for the refusal of unacceptable loads;
- Site specific written procedures for the control of nuisance conditions;
- Record keeping procedures; and,
- The requirements of the ECA.

A record of the employee training, including the date of training, the name and signature of the employee and a description of the training provided will be maintained.

3.7 Waste Screening Procedure

Waste will be accepted only from approved haulers that have a valid Waste Systems ECA, as per Section 16(1) of O. Reg. 347 (MOE, 1990). Additionally, small IC&I waste loads may be accepted at the small loads area. It is expected that this will make up a very small percentage of the total incoming waste stream.

All incoming vehicles must enter over the weigh scale to determine the weight of waste coming into the MRF. The scale attendant will do an initial screening of the load. After the initial weigh-in, incoming vehicles containing a mixture of IC&I materials suitable for processing will be directed to the MRF. An employee located at the MRF receiving area will inspect the incoming material to ensure that the load does not contain any unacceptable or prohibited wastes or materials. Loads that do contain prohibited materials will be rejected and will be reloaded onto the vehicle delivering the load.

In the unlikely event that unacceptable or prohibited material is not detected until the hauler has left the Site, the material will be segregated, characterized, and managed in accordance with O. Reg. 347. An incident report will be completed. Effort will be made to identify and contact the customer and/or generator of the materials to ensure that prohibited materials will not be delivered to the facility in the future.

3.8 Monitoring, Environmental Emergency and Contingency Plan

An Environmental Emergency and Contingency (E2C) Plan will be developed for the entire CRRRC Site as described in the D&O Report for the complete CRRRC Site.

Environmental monitoring related to the MRF will be carried out concurrently with the overall Site monitoring program. As such, reference should be made to the overall facility D&O report for monitoring, trigger mechanisms and contingency measures related to dust, noise, and odour.

3.9 Disruption of Shipment

Should there be a disruption of shipment of recovered materials, the MRF would be able to continue to accept waste until the MRF reaches the maximum approved storage capacity. At that time, the MRF would not accept additional waste for processing. If the shipment disruption continues such that the maximum approved storage time would be exceeded, then the material would be sent for disposal at the landfill. Additional material would not be accepted at the MRF until shipment of the recovered materials was possible.



4.0 CLOSURE

We trust that this report meets your current needs. If you have any questions, or if we may be of further assistance, please contact the undersigned.

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Principal

ALC/MKF/PAS/sg

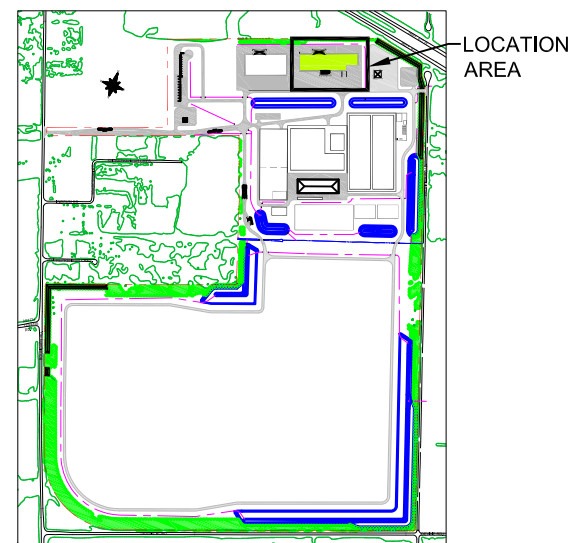
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- Ministry of Community Services and Correctional Services (MCSCS). (2007). *Fire Protection and Prevention Act – Fire Code: Ontario Regulation (O.Reg.) 213/07*.
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SITE PLAN

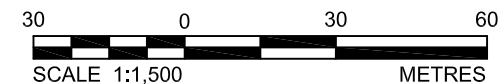
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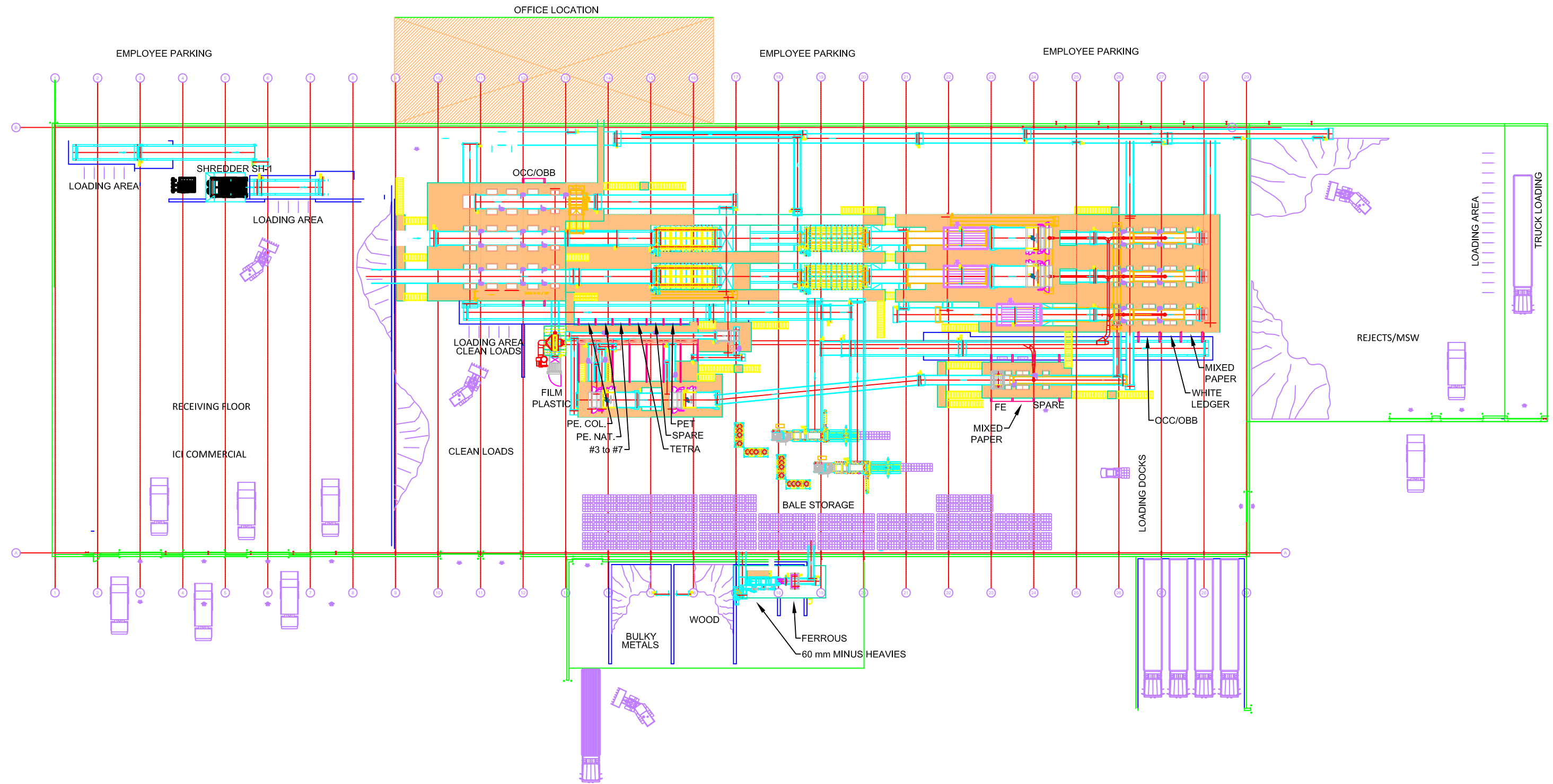
								
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PROJECT								
CAPITAL REGION RESOURCE RECOVERY CENTRE								
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MATERIALS RECOVERY FACILITY AREA PLAN								
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Figure 1

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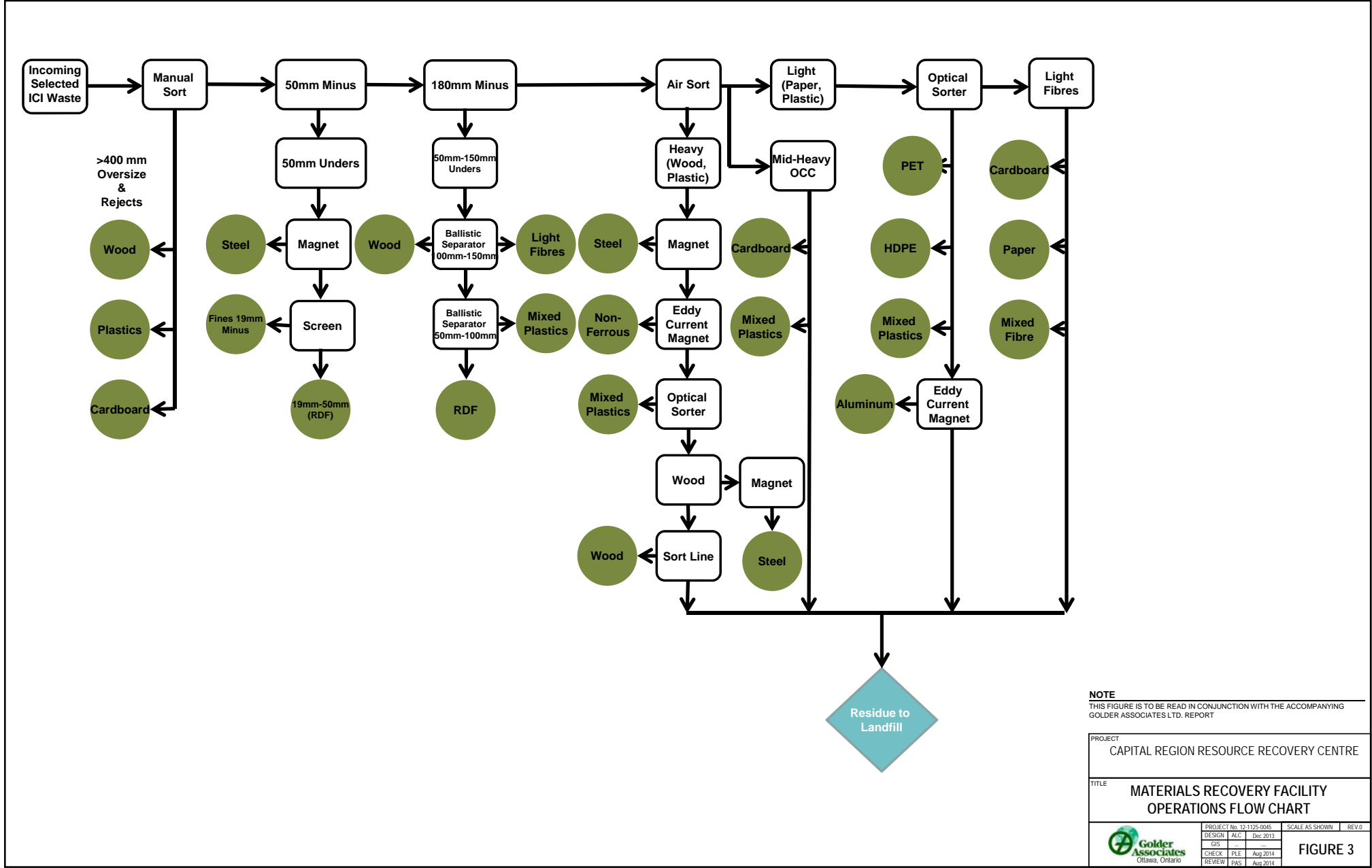


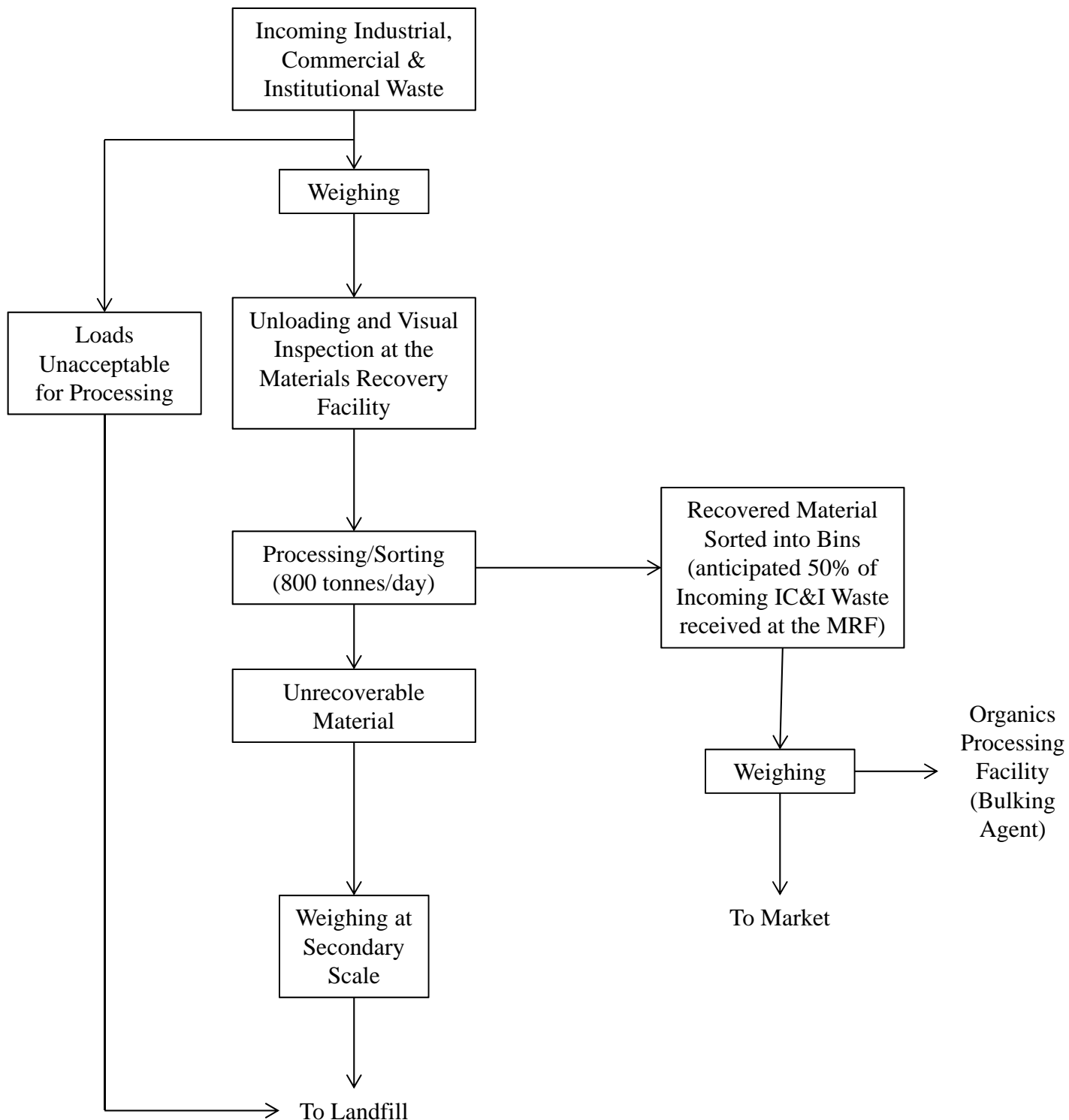
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REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RW
PROJECT						
CAPITAL REGION RESOURCE RECOVERY CENTRE						
TITLE						
MATERIALS RECOVERY FACILITY LAYOUT						
PROJECT No.			12-1125-0045	FILE No. 1211250045-V4-MRF-Fig 2.dwg		
DESIGN			M.L.F.	10 Dec, 2013	SCALE N.T.S. REV. 0	
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NOTE

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PROJECT			
CAPITAL REGION RESOURCE RECOVERY CENTRE			
TITLE			
Materials Recovery Facility Material Balance			
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	DESIGN	MKF	Nov. 2013
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	REVIEW	PAS	Aug. 2014
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FIGURE 4			

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