APPENDIX F

Organics Processing Facility Design and Operations

December 2014

APPENDIX F

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

REPORT

Report Number: 12-1125-0045/4500/vol IV

Golder Associates

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FIGURES

1.0 INTRODUCTION

This appendix to the Design and Operations (D&O) Report has been prepared to describe the proposed organics processing facility, a waste processing facility that will operate as 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.

It is anticipated that processing of organic waste materials from the industrial, commercial and institutional (IC&I) waste stream will be carried out at the CRRRC. Both source separated organic (SSO) waste and mixed IC&I waste with sufficiently high organic content will be accepted for processing at the organics processing facility. Processed materials will be either sold to off-Site markets or used on-Site in accordance with existing regulations. Residual, physical contaminants screened out of the organic waste throughout the processing will be hauled to and disposed of in the on-Site landfill or sent to on-Site recovery facilities.

It is proposed that the organics processing facility will utilize BioPower (BP) technology in processing the organic waste received on-Site. Initially, a demonstration scale BP organics processing facility will accept primarily mixed organics from the IC&I waste stream, while the majority of SSO waste will be pre-processed and hauled off-Site to farm based anaerobic digesters (AD); pre-processed SSO waste may also be hauled to other approved commercial AD facilities in place of farm based ADs. Once the demonstration scale facility performance has been optimized and shown the effectiveness of the BP technology, the facility will be scaled up to accept a larger quantity of organic materials for processing as described below. Transport of pre-processed SSO waste to farm based ADs may also be continued as a component of the CRRRC's organic processing capability depending on market demand.

The organics processing facility has been sized based on the anticipated operational parameters and performance of the component processes to accommodate 50,000 tonnes per year of organics when it is running at the full scale. However, the demonstration scale of the organics processing facility will operate by processing up to 23,400 tonnes per year of organics. It is noted that the design and operation of the full-scale on-Site organics processing facility will be optimized based on the results of the demonstration scale facility.

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

- Receive and pre-process up to a maximum of 20,000 tonnes of organic SSO waste per year destined for off-Site farm based AD or other approved commercial AD facilities;
- Receive up to a maximum of 4,000 tonnes of mixed IC&I waste with sufficient organics per month destined for the BP demonstration-scale operation, with a maximum annual limit of 23,400 tonnes per year;
- For the full scale BP process, maximum storage quantity of 1,800 tonnes of unprocessed organic waste material destined for the BP process in the pre-processing building, 600 tonnes of pre-processed organic waste destined for the BP primary reactor cells in the pre-processing building, and 1,000 cubic metres of pre-processed organic slurry for delivery to off-Site farm based AD at any one time in outdoor tanks;

- Receiving hours of 6:00 a.m. to 6:00 p.m., Monday to Saturday;
- Operating hours of 6:00 a.m. to 7:00 p.m., Monday to Saturday within the building; and,
- Operating hours of 7:00 a.m. to 7:00 p.m., Monday to Saturday at the primary reactor cells.

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

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.

The Guideline for the Production of Compost in Ontario (MOE, 2012a) recommends planning, design and operational practices for aerobic composting facilities. The companion Ontario Compost Quality Standards (MOE, 2012b) sets environmentally protective standards for the production of compost for beneficial use and applies to compost produced by aerobic composting of non-hazardous organic materials. The guideline was used as guidance when developing this appendix to the D&O report.

Part IV and Part V of O.Reg. 101/94 (MOE, 1994) applies to sites whose only function is to accept and transfer municipal waste as described in O.Reg. 347 (which includes waste from the IC&I and construction and demolition (C&D) sectors) for recycling or to compost leaf and yard waste. Part IV and Part V of O.Reg 101/94 were used as guidance when developing this appendix to the D&O report.

2.0 ORGANICS PROCESSING FACILITY DESIGN

2.1 Function of the Organics Processing Facility

The function of the organics processing facility is to receive and process non-hazardous organic waste from the IC&I waste stream. Both SSO and mixed IC&I waste with a sufficiently high organic content will be accepted at the organics processing facility. The majority of SSO waste received at the Site will at least initially be pre-processed and sent to off-Site farm based or other approved commercial ADs. Mixed IC&I waste will be processed on-Site, initially in a demonstration-scale facility, with the product of the processing sent to the compost processing and storage area where it will undergo final processing/curing before being sold to off-Site markets or used on-Site.

2.2 Facility Layout

Figure 1 shows the proposed layout of the organics processing facility. The facility is located within the north part of the Site, just south of the C&D) processing facility and the materials recovery facility (MRF), and immediately adjacent to the compost processing and storage area.

The organics processing facility will consist of the following areas:

- The pre-processing building, which is anticipated to serve for the pre-processing, demonstration scale and the full scale receiving and storage, has been assumed to have a footprint area of approximately 3,000 square metres and a height of approximately 12 metres;
- The primary reactor cells will be built on an ongoing basis based on the quantity of material to be processed, and are anticipated to ultimately consist of two main cells that are up to 70 metres wide by 300 metres long, with sloped sides and a height up to approximately 6.5 to 7 metres;
- The secondary digester building will have dimensions of approximately 20 by 30 metres, and a height of approximately 10 metres; and,
- The compost processing and storage pad will occupy an area of approximately 3.5 hectares and will have a paved surface.

Both liquor (liquid by-product from digestion) collected by floor drains in the pre-processing building and liquor from the secondary digester building will be collected in underground holding tanks. The liquor will be re-used in the process as much as possible; surplus will be sent to the on-Site leachate pre-treatment facility. Liquor collected from the secondary digester building may also be considered for off-Site use on farms.

The facility will be heated by heat recovered from the flare/generator or a biogas boiler or via a backup fuel oil heating system.

2.3 Wastes Accepted at the Site

2.3.1 Waste Characterization

The organics processing facility will accept organic waste from the IC&I stream. Organic IC&I waste will be accepted in two forms:

1) SSO Waste: clean, high moisture, SSO loads (generally less than 30% total solids and less than 25% physical contamination); and,

2) Mixed IC&I Waste: IC&I loads that have a sufficiently high organic fraction (generally greater than 50% organics and greater than 30% total solids).

2.3.2 Waste Quantities

The demonstration scale facility will accept up to 23,400 tonnes per year of mixed IC&I waste with sufficient organic content.

The full scale organics processing facility will accept a maximum of 50,000 tonnes per year of organic waste (mixed IC&I and SSO) destined for the primary reactor.

The organics processing facility will accept a maximum of 20,000 tonnes per year (out of the total 50,000 tonnes per year) of SSO waste for pre-processing before being transported to off-Site farm based or other approved commercial AD processing.

2.3.3 Waste Storage

SSO destined for the farm based or other approved commercial ADs will typically have one day of storage volume in the receiving hopper. After the SSO has been pre-processed into an organic slurry, it will be transferred to a tank(s) with a capacity to store 1,000 cubic metres of slurry.

Unprocessed mixed waste with a sufficiently high organic content destined for the primary reactor can be stored for up to three days on the receiving floor in the pre-processing building, which equates to approximately 1,800 tonnes. There will also be storage capacity in the pre-processing building for approximately 600 tonnes of pre-processed organic waste for delivery to the primary reactor.

It is anticipated that the organics received will typically be mixed and removed from the pre-processing building on the day they arrive, limiting the time that they create an odour source in the building. If it is necessary to leave odorous material in the building, it would be covered with a carbon source material to mitigate odours as required.

2.4 BioPower Demonstration Facility

It is proposed that a demonstration scale facility will be operated for demonstration of the BP technology. The purpose of the demonstration is to:

- Confirm the effectiveness of the BP technology in treating organic waste;
- Provide information to enhance and optimize the BP technology; and,
- Refine process design and operating parameters for operation on a full-scale commercial basis.

The demonstration will be performed by constructing and operating a facility that incorporates all of the processes and facilities associated with the BP technology. These facilities will be expanded as required and incorporated into the full-scale plant following completion of the demonstration phase, depending on the results of the demonstration phase and market demand. The principal facilities to be used in the course of the demonstration are:

- Organics pre-processing building;
- Biofilter for treatment of air from the organics pre-processing building;
- Primary reactor;
- Secondary reactor;
- Negative pressure extraction system;
- Flare;
- Equipment for blending organic materials, transportation and placement of blended material in the primary reactor, installation of a cover system, excavation and transportation of digested product, processing of digested product, processing/curing of digested product, refurbishment of primary reactor for re-use; and,
- Monitoring and analytical equipment.

The demonstration project at the CRRRC will be conducted within the area designated in the Site layout plan for operation of the full-scale organic processing facility as shown on Figure 1.

The BP process is a system for continuous anaerobic digestion of organic waste to produce biogas and digested product. The system has a primary reactor with multiple reactor zones, each of which is filled, in sequence, with organic waste blended with bulking agent (e.g., wood chips). The organic waste remains in the reactor zone in which it is placed until it is removed by excavation following digestion and curing. The waste in each zone is allowed to decompose anaerobically until gas production is essentially complete, at which point the process is converted to aerobic decomposition, followed by excavation of the digested cured product. Thus the newest zone is being filled, and the oldest excavated, while the others are operating in the anaerobic phase. A secondary anaerobic reactor digests the organic liquor generated in the primary reactor, to produce biogas and spent liquor. Most of the spent liquor is returned to the primary reactor, as required, to enhance anaerobic decomposition; the balance may be considered for alternative uses off-Site, such as nutrients on farms, or combined with the landfill leachate for pre-treatment. The biogas collected from the system is flared or treated and used as fuel for the operation of the facility itself, or converted to electricity. The organic waste decomposition process is controlled within the primary reactor such that anaerobic digestion is optimized between the primary and secondary reactors.

All the individual unit operations are simple, reliable and proven. All individual operations have been used successfully and implemented many times in other waste management operations and within the BP process none are required to be operated outside their normal operating parameters. Odour will be controlled by capturing and combusting the gas generated from the process, with a biofilter for treating building air and as back-up to the flare.

The primary reactor cells will be built in stages and consist of an encapsulation design. The encapsulation design will consist of a shallow excavation with a geomembrane bottom liner, an underdrain system to remove the liquor generated by the digestion process, an upper insulating layer and a geomembrane cover as shown on Figure 2. Piping will be placed within the organic material to allow recirculation of collected liquor and for extraction of biogas and odour control. The primary reactor cells will be built on an ongoing basis based on the quantity of material to be processed, and are anticipated to ultimately consist of two main cells that are up to 70 metres wide by 300 metres long, with sloped sides and heights up to approximately 6.5 to 7 metres. The material will be temporarily covered when placed in the cell until additional material is placed in the adjoining area. The anaerobic digestion period within the cell is anticipated to be approximately 12 to 18 months.

2.5 BioPower Full-Scale Facility

As the demonstration progresses, data will be gathered and the performance assessed from three perspectives: environmental, operational and economic. Part V EPA (MOE, 2010b) approval will be sought, depending on the results, for conversion of the system to full-scale commercial operation. In practical terms, full-scale operation will entail the construction of additional primary reactors to meet market demand and possibly the scale-up of the secondary digester by adding one or more additional units. Pumps, piping and leachate storage will also be scaled up as required. The precise system requirements will be specified in the Part V application.

2.6 Pre-Processing for Off-Site AD Processing

In order to ensure organics diversion capability during the demonstration period for the BP facility and to meet market demand, it is proposed to provide capacity for SSO and pre-process them into an organic slurry to be taken by tanker to approved off-Site farm based (or other approved commercial) ADs for final processing. Should this operation prove successful and there be continued interest/demand from ADs, Taggart Miller may elect to continue it for source-separated organics while operating the BP facility for organic streams for which that technology is more appropriate.

The pre-processing area for SSO waste to be transferred to off-Site ADs will be within the receiving and storage building and consist of a lined receiving pit, a clam/crane to transfer SSO waste to a feed hopper attached to a masher, an intermediate storage tank, hydraulic squeezing equipment for the separation of physical contaminants from the SSO waste, and an outdoor storage tank for the pre-processed slurry from which tankers are loaded for transfer of the material off-Site.

The total area of the receiving and storage building, which will house the pre-processing activities, has been assumed to have a footprint of approximately 3,000 square metres and a height of approximately 12 metres. The organic pre-processing building, as well as internal and external storage tanks, will be kept under negative pressure to reduce the potential for fugitive odour emissions and the air will be exhausted and treated through a biofilter.

The current receiving and storage building design approach keeps the trucks outside the facility as they unload. Alternatively the building envelope could be extended to have the trucks enclosed in a secondary structure to increase the ability to keep the processing building under negative pressure and reduce potential fugitive odour emissions. The receiving area for the primary reactor cell pre-processing will be similarly designed to allow the trucks to discharge while minimizing the volume of air requiring treatment.

3.0 ORGANICS PROCESSING FACILITY OPERATIONS

3.1 Hours and Days of Operation

The organics processing facility will operate between the hours of 6:00 a.m. and 7:00 p.m., Monday through Saturday in the building and 7:00 a.m. and 7:00 p.m., Monday through Saturday at the primary reactor cells. 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.

3.2 Organics Processing

The operational flow chart for the organics processing facility is shown on Figure 3. The following sections describe the different aspects of the organics processing facility.

3.2.1 BioPower Demonstration Facility

Operation of the demonstration unit will parallel the planned operation of a full-scale commercial facility:

Organic waste will be delivered to the organics pre-processing building where it will be blended with a bulking agent and other material to optimize the carbon:nitrogen ratio and permeability of the waste.

The blended material will then be transported to and placed into the primary reactor. A layer of cover soil or other material will be placed over blended material in the primary reactor at the end of the operating day. The primary reactor will be progressively filled until it reaches the maximum fill elevation; at that point a cover consisting of soil/compost insulating layer and a geomembrane will be placed over the completed portion of the primary reactor. Inoculum, containing the appropriate microbes, may be added to the blended material in order to enhance the biological degradation process. During filling, air injection and liquor injection pipes will be progressively installed.

Complete portions of the primary reactor will be equipped with a negative pressure extraction system to remove biogas produced by decomposition. This gas will be flared or used as fuel for energy production.

Liquor percolating from the blended material in the primary reactor will be collected in the drainage system and pumped to the secondary reactor. Biogas produced in the secondary reactor will be combined with that generated in the primary reactor(s) and flared or used as fuel for energy production. Effluent from the secondary reactor will be recirculated to the primary reactor, considered for alternative off-Site uses, such as nutrients on farms, or discharged to the CRRRC leachate pre-treatment system.

Once the organic material in a primary reactor zone has been digested, the reactor zone will be drained and turned aerobic by progressive introduction of air. The resultant gases will be extracted from the reactor and used as combustion air in the flare or energy recovery facility, or treated in the biofilter.

After the digested product in the primary reactor has been aerobically stabilized, it will be removed and transported to the compost processing and storage area, where it will be further processed/cured for approximately 6 months, screened to remove contaminants, and the resulting cured digested product assessed for use as a soil conditioner/compost product, failing which it will be used as daily cover in the landfill. Digested product will be cured in open windrows or trapezoidal piles located downgradient (in terms of surface water runoff) from other curing materials (leaf and yard waste, clean wood waste) accepted at the compost processing and storage area.

The quality of the runoff from curing digested product is unknown and as such runoff from the curing windrows/trapezoidal piles will be collected in a stormwater management pond. As part of the demonstration process, regular water quality analysis of the pond is proposed. Depending on the results of the water quality analysis, the pond water can be re-used in the on-Site composting process, re-used for on-Site irrigation or sent for off-Site treatment to the City of Ottawa wastewater treatment plant. It is noted that, as a contingency, aerators may be required to reduce odour in this pond. Further, the processing of organics in the demonstration primary reactor will take 12 to 18 months. Therefore, the compost pad will not be needed for curing of digested product for at least 12 to 18 months, during which time the pond will only receive runoff associated with windrow/trapezoidal pile curing of leaf and yard waste.

During the demonstration phase the primary reactor will be monitored for:

- Temperature (ambient and within the reactor);
- Moisture content of waste;
- Nitrogen levels in waste;
- Biogas production rate;
- Biogas quality (methane; carbon dioxide; sulphur compounds; ammonia);
- Liquor production rate;
- Liquor character (BOD; COD; Nitrate/Nitrite; ammonia - N; P; K; TOC; metals, solids, volatile fatty acids);
- Reactor surface settlement;
- Liquor recirculation rate;
- Moisture addition; and,
- Hydraulic conductivity.

The secondary reactor will be monitored for:

- Biogas production rate;
- Biogas quality; and,
- Effluent quality.

Data will be analyzed and used to adjust operating conditions as appropriate. The monitoring program may be adjusted in response to ongoing data review and analysis.

The characteristics/quality of compost produced by the BP process will be monitored in accordance with MOECC compost guidelines (MOE, 2012b).

3.2.2 BioPower Full-Scale Facility

The demonstration will be performed for a minimum of one complete treatment cycle (filling primary reactor, anaerobic treatment of organics in primary reactor and liquor in secondary reactor, aerobic stabilization of material in primary reactor, emptying of primary reactor, screening and processing/curing of digested product, and analysis of compost quality). For planning purposes, it is anticipated that the demonstration will operate for a period of 24 to 36 months.

As the demonstration progresses, data will be gathered and the performance assessed from three perspectives: environmental, operational and economic. Part V EPA (MOE 2010b) approval will be sought for conversion of the system to full-scale commercial operation. The precise system requirements will be specified in the Part V application. Operationally, the transition from demonstration to full-scale is expected to be seamless, since the demonstration system will be fully incorporated into the commercial plant.

3.2.3 Pre-Processing for Off-Site AD Processing

Pre-processing of SSO waste will consist of the following:

- Trucks will tip clean high moisture SSO through elevated overhead doors and into a lined receiving pit.
- An overhead clam/crane system will pick up material and feed it to a feed hopper, which will meter the flow off waste to the masher.
- The masher, an enclosed component used to reduce the size of the SSO waste, will drop the mashed organic waste, now a slurry, into an intermediate storage tank.
- Material from the intermediate storage tank will be pumped to the hydraulic squeezing equipment, which forces the slurry through small openings to separate the more liquid slurry from any physical contaminants. The wet slurry (organics) is then pumped to an enclosed tank outside the building.
- The physical contaminants separated from the organic slurry may still have some residual organics trapped with them depending on the quality and nature of the materials received. Depending on the amount of organics remaining within the separated physical contaminants, they will either be mixed with organic materials accepted for processing in the BP digester or sent to the on-Site landfill. If being landfilled, the contaminants would be stored in a bin that is emptied at the landfill once it is full to reduce the potential for odour.
- The pre-processed SSO slurry will be pumped onto tankers and delivered to the off-Site AD facilities.

3.3 Waste Receiving Sites

Screened physical contaminants from the organics processing facility will be sent to the on-Site landfill or to other on-Site recovery facilities.

3.4 Organics Processing Facility Equipment and Maintenance

The organics processing facility operation will utilize the following mobile equipment:

- Ford F-150 4x4 pickup truck (shared with compost processing and storage area);
- Triaxle 400 HP dump truck;
- Caterpillar 966 loader (shared with compost processing and storage area);
- Caterpillar 246 skidsteer;
- McCloskey 36X100 ST conveyor (uncovered);
- Caterpillar M318 excavator (shared with compost processing and storage area);
- Supreme 1000T Eco mixer; and,
- A compost pasteurizer.

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

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

3.5 Staff Training

A training plan will be developed and maintained for all employees that operate the organics processing facility. Trained personnel will supervise all receiving of waste at the organics processing facility. 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.

3.6 Quality Control

3.6.1 Waste Screening Procedure

All incoming vehicles must enter and exit over the weigh scale to determine the weight of waste coming into the organics processing facility. The scale attendant will do an initial screening of the load. After the initial weigh-in, provided the incoming vehicle contains sufficient organics of suitable quality for processing, it will be directed to the organics processing facility. An employee located at the organics processing facility receiving area will inspect the incoming material to ensure that the load does not contain any unacceptable or prohibited wastes or materials. Loads that 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 (MOE, 1990). 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.

3.6.2 End Product Quality

A sampling program will be developed and undertaken to assess the quality of the final products of the organics processing facility. Compost will be sampled to meet the requirements of the Ontario Compost Quality Standards (MOE, 2012b); liquor from the secondary digester and pre-processed organic slurry will be sampled and tested to meet the requirements of the *Nutrient Management Act* (MOE, 2002) or as required by the approvals of the receiving facility.

Finished products will not be removed from the Site until the product has been sampled and analyzed and their quality shown to meet the applicable quality requirements.

The results of the quality analysis will dictate the final use of the product.

Cured digested product that is not of acceptable quality for other uses could be returned to the start of the organics processing facility and incorporated into the incoming feedstock or sent to the landfill as daily cover, and possibly used to support vegetation growth on the landfill final cover.

Liquor from the secondary digester and pre-processed organic slurry will be sampled and tested as required by the *Nutrient Management Act* (MOE, 2002) or other approvals to determine the suitability of the material for use off-Site. Liquor not suitable for use off-Site will either be re-used in the process or sent for pre-treatment at the on-Site leachate pre-treatment facility.

4.0 ODOUR MANAGEMENT PLAN

The following measures will be taken to reduce odour at the organics processing facility:

- The material in the receiving hopper and the material being fed to the metering hopper is likely the highest odour generating source for the SSO in the off-Site AD pre-processing line. Material will usually be processed on a frequent basis and thus reduce the contact time between the material and the open air within the enclosed pre-processing building. Once the material enters the masher, the odour generating potential is reduced, since the material is enclosed within piping or storage tanks until loaded into enclosed tankers for shipment to the farms.
- The organic pre-processing building, as well as internal and external storage tanks, will be kept under negative pressure to reduce the potential for fugitive odour emissions and the air will be exhausted and treated through a biofilter.
- If it is necessary to leave odorous material in the pre-processing building, it would be covered with a carbon source material to mitigate odours.
- Physical contaminants that will be landfilled would be stored in a bin that is emptied at the landfill once it is full to reduce the potential for odour.
- The gases from the primary reactor will be extracted from the reactor and used as combustion air in the flare or energy recovery facility, or treated in the biofilter.

5.0 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 organics processing facility 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 groundwater, leachate, surface water, sediment, dust, noise, odour and biology.

6.0 ORGANICS PROCESSING FACILITY CLOSURE PLAN

Should the organics processing facility no longer be needed for the processing of organic IC&I waste, it will be decommissioned and closed prior to a change in use or sale of the property. If it is determined that the organics processing facility will close, an assessment of the organics processing facility will take place and a closure plan will be completed and submitted to the District Manager of the MOECC.

In general the closure plan will:

- Cease acceptance of waste;
- Continue operations until all waste at the organics processing facility has been processed. Alternatively, unfinished product may be transferred to another approved composting facility to complete the process, or be landfilled;
- Transfer final product to markets;
- Remove all residual waste to final disposal;
- Remove all equipment from the organics pre-processing and secondary reactor buildings and power wash the buildings;
- Remove and dispose of the contents of the slurry tank and leachate tank; and,
- Dismantle and remove the biofilter.

7.0 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.

GOLDER ASSOCIATES LTD.

M.K. Farnel, P.Eng.
Environmental Engineer

P.A. Smolkin, P.Eng.
Principal

ALC/MKF/PAS/sg
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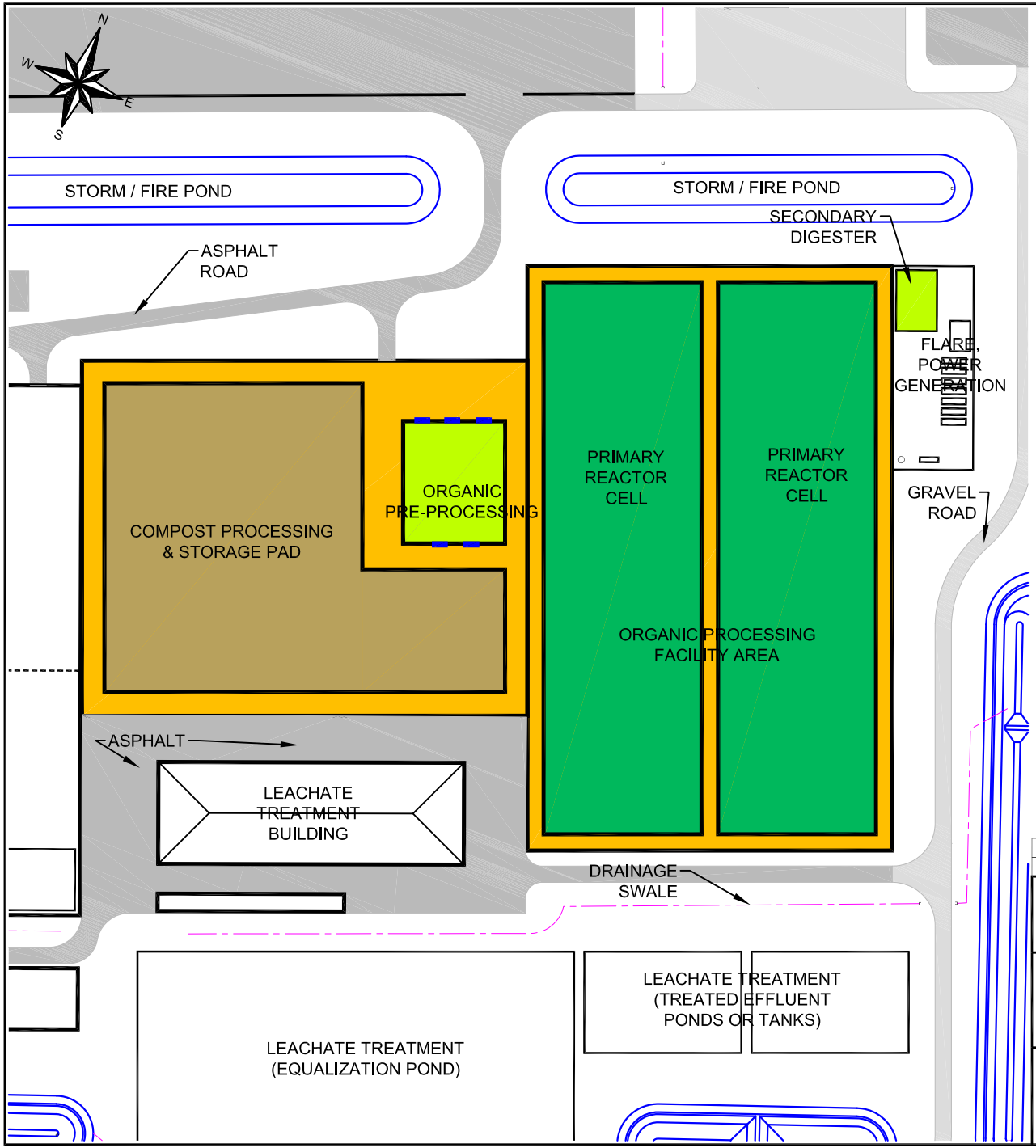

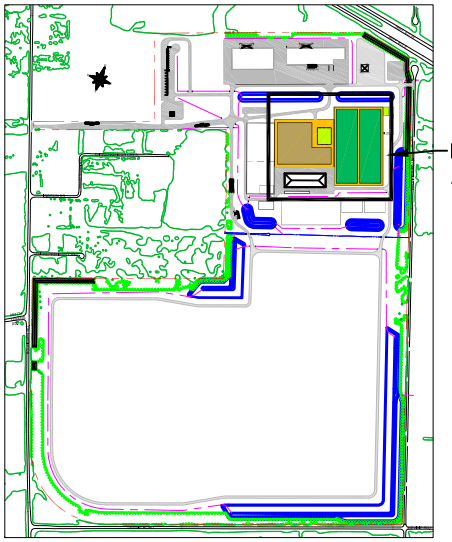

SITE PLAN
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60 0 60 120
SCALE 1:3,000 METRES

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW

PROJECT
CAPITAL REGION RESOURCE RECOVERY CENTRE

TITLE
ORGANICS PROCESSING FACILITY AREA PLAN

Golder Associates
Ottawa, Ontario, Canada

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REVIEW	P.A.S.	Aug. 2014	

PLOT DATE: July 7, 2014
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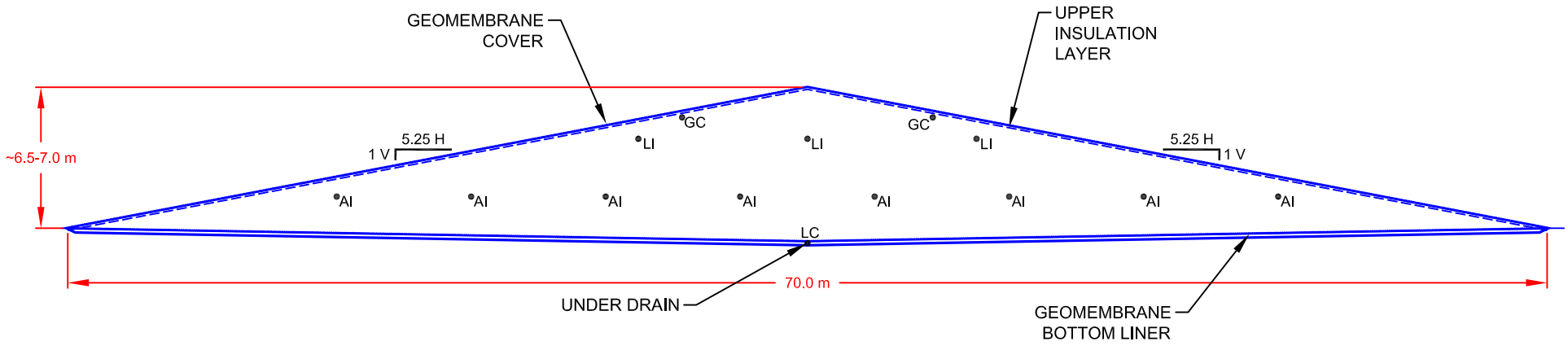
LEGEND:
GC = GAS COLLECTION PIPES
LC = LIQUOR COLLECTION PIPES
AI = AIR INJECTION PIPES
LI = LIQUOR INJECTION PIPES



CROSS-SECTION VIEW

SCALE: N.T.S.

NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT.

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW
△						

PROJECT

CAPITAL REGION RESOURCE RECOVERY CENTRE

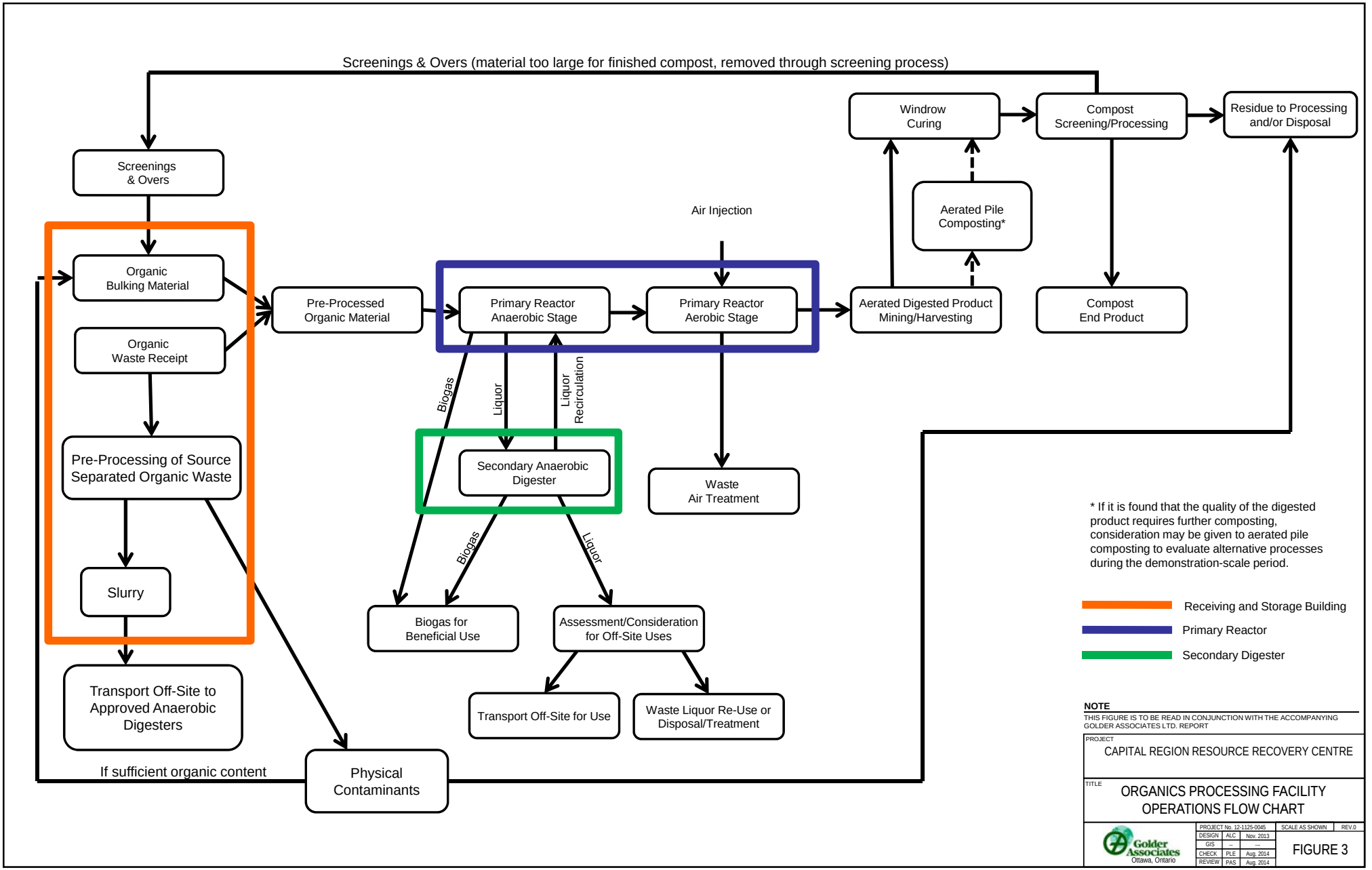
TITLE

PRIMARY REACTOR CELL DETAIL

Golder Associates
Ottawa, Ontario, Canada

PROJECT No.		12-1125-0045	FILE No.	1211250045-V4-Org-Fig 2.dwg	
DESIGN	A.C.	16 Dec. 2013	SCALE	AS SHOWN	REV. 0
CAD	M.L.F.	16 Dec. 2013	DRAWING No.		
CHECK	P.L.E.	Aug. 2014			
REVIEW	P.A.S.	Aug. 2014			

Figure 2


Screenings & Overs (material too large for finished compost, removed through screening process)
Screenings & Overs
Organic Bulking Material
Organic Waste Receipt
Pre-Processing of Source Separated Organic Waste
Slurry
Transport Off-Site to Approved Anaerobic Digesters
If sufficient organic content
Physical Contaminants
Pre-Processed Organic Material
Primary Reactor Anaerobic Stage
Primary Reactor Aerobic Stage
Air Injection
Biogas
Liquor
Liquor Recirculation
Secondary Anaerobic Digester
Biogas for Beneficial Use
Biogas
Liquor
Assessment/Consideration for Off-Site Uses
Transport Off-Site for Use
Waste Liquor Re-Use or Disposal/Treatment
Waste Air Treatment
Aerated Digested Product Mining/Harvesting
Windrow Curing
Aerated Pile Composting*
Compost Screening/Processing
Compost End Product
Residue to Processing and/or Disposal
* If it is found that the quality of the digested product requires further composting, consideration may be given to aerated pile composting to evaluate alternative processes during the demonstration-scale period.
Receiving and Storage Building
Primary Reactor
Secondary Digester
NOTE
THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT
PROJECT
CAPITAL REGION RESOURCE RECOVERY CENTRE
TITLE
ORGANICS PROCESSING FACILITY OPERATIONS FLOW CHART
Golder Associates
Ottawa, Ontario
PROJECT No. 12-1125-0045
SCALE AS SHOWN
REV.0
DESIGN ALC Nov. 2013
GIS -- ---
CHECK PLE Aug. 2014
REVIEW PAS Aug. 2014
FIGURE 3

As a global, employee-owned organisation with over 50 years of experience, Golder Associates is driven by our purpose to engineer earth's development while preserving earth's integrity. We deliver solutions that help our clients achieve their sustainable development goals by providing a wide range of independent consulting, design and construction services in our specialist areas of earth, environment and energy.

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