



**Miller Waste Systems Inc.**

8050 Woodbine Ave

Markham, Ontario L3R 2N8

Email: [millerwaste@millerwaste.ca](mailto:millerwaste@millerwaste.ca)

Tel: 905-475-6356

## **Construction Management Plan**

**Zooshare Anaerobic Digester Project**

**Prepared by Miller Waste Systems Inc., September 2018**



## **Miller Waste Systems Inc.**

8050 Woodbine Ave  
Markham, Ontario L3R 2N8  
Email: millerwaste@millerwaste.ca  
Tel: 905-475-6356

# **CONSTRUCTION MANAGEMENT PLAN**

## **INTRODUCTION**

Stonecrest Engineering Inc. (Stonecrest) has been retained to provide Professional Engineering service to the ZooShare Anaerobic Digester. Miller Waste Systems Inc. is ZooShare's project partner and is providing engineering design and oversight to the ZooShare Anaerobic Digester. This project has received FIT contract (F-003038-BIG-211-203) and is designed to generate 500kW of renewable energy. As part of the approvals process this project has been granted a Renewable Energy Approval by the Ontario Ministry of the Environment and Climate Change, Number 4501-9VJK3N. The project is now in the process of obtaining the required building and construction permits. This report has been produced to clearly identify to concerned parties the nature and scope of work that will be undertaken to complete the project.

It is important to note that the proposed facility is to be constructed on the Toronto Zoo's existing composting facility. This facility will remain operational throughout the construction process and will only be taken out of service upon completion of this project.

The Renewable Energy Approval issued by the Ontario Ministry of the Environment and Climate Change, Number 4501-9VJK3N is included as ANNEX A.

## **LOCATION**

Refer to construction drawings submitted with this report.

## **TIMING**

The project is currently scheduled to begin works in June 2018 with a temporary gravel pad to be installed in Mid-may for storage of the CHP container (week of May 11 2018). It is a requirement of the Feed in Tariff Contract under which this project is being constructed that this project be in "Commercial Operation" as of the 18<sup>th</sup> of July 2018. In order to meet these stringent timelines this dictates a phased construction approach, first focusing on electrical components to meet the contractual definition of Commercial Operation as per the Feed in Tariff Contract with the IESO. It is currently planned that the facility be ready to start building the necessary biology within the digester tank in December, although the winter temperatures may delay that until March.

Work on this project is expected to be completed between the hours of 7am and 6pm Monday to Friday.



## **Miller Waste Systems Inc.**

8050 Woodbine Ave  
Markham, Ontario L3R 2N8  
Email: millerwaste@millerwaste.ca  
Tel: 905-475-6356

### **CONSTRUCTION PHASES**

#### Phase 1: Electrical Components

- Part 1: Site Preparation
- Part 2: Excavation
- Part 3: Concrete Work And Structural Erection
- Part 4: Installation Of Underground Works
- Part 5: Site Grading
- Part 6: Completion Of Electrical Works
- Part 7: Testing & Commissioning

#### Phase 2: Balance of the Facility

- Part 1: Site Preparation
- Part 2: Excavation
- Part 3: Concrete Work And Structural Erection
- Part 4: Installation Of Underground Works
- Part 5: Site Grading (Testing)
- Part 6: Completion Of Mechanical And Electrical Works
- Part 7: Commissioning
- Part 8: Sustained Operation

### **PHASE 1: ELECTRICAL COMPONENTS**

- **Part 1: SITE PREPARATION**

The Combined Heat and Power Unit (CHP) will arrive on site in mid-May (ETA week of May 11 2018). Until the required permits are obtained, the two locked shipping containers will be stored on the north end of the site. Prior to its arrival, a small area large enough to place the containers will be cleaned and made level. Approximately six inches of crushed stone will be placed to support the two containers until the foundations are build. All underground utilities will be marked by the appropriate contractor and this will be the responsibility of the excavation contractor. This contractor shall ensure that all utilities remain marked during the course of the project.

No vegetation removal is necessary for the construction or installation of electrical components.

The Toronto Zoo will have continued access to this facility to during construction. Crushed stone may be placed at the facility entrance to allow delivery equipment to better access the site. This will improve site access to both the Zoo vehicles and construction vehicles.



## **Miller Waste Systems Inc.**

8050 Woodbine Ave  
Markham, Ontario L3R 2N8  
Email: millerwaste@millerwaste.ca  
Tel: 905-475-6356

- **Part 2: EXCAVATION**

Large scale Excavation of the site is not required for the construction or installation of electrical components.

A trench will need to be cut to allow for electrical service to be run to the point of common coupling. This trench will be completed and backfilled in 200ft sections to minimize impact on the area north of the main construction site. This work will be completed by Toronto Hydro as part of their standard construction practices. In addition, one hole measuring 12m long, 3m wide and 1.5 m deep will be required to construct the concrete foundation for the CHP. Once complete, the voids will be backfilled with the previously excavated material. A second minor excavation will be required for the concrete foundation of the control room which will house the electrical switchgear. The drawings of these foundations can be found with the attached Phase 1 construction drawings.

- **Part 3: CONCRETE WORK AND STRUCTURAL ERECTION**

Upon completion of the above, materials will be brought on site and foundations will be prepared for a control building and the combined heat and power (CHP) unit.

- **Part 4: INSTALLATION OF UNDERGROUND WORKS**

Upon substantial completion of the concrete works underground electrical equipment, conduits and raceways will be installed to allow for the completion of trench backfilling in an expedited manner. All electrical work will then be tested and checked prior to backfill.

Some electrical underground work will be completed using directional horizontal drilling to avoid sensitive areas and minimize site remediation required.

- **Part 5: SITE GRADING**

All electrical work will then be backfilled with appropriate materials following the guidelines for "Construction Materials Brought Onsite" outlined below as per the electrical drawings submitted to the Electrical Safety Authority (ESA). These materials are typically clean sand and fine gravel to prevent damage.

- **Part 6: COMPLETION OF ELECTRICAL WORKS**

Simultaneously with part 5, part 6 will consist of the completion of electrical works. To allow for commissioning to begin in the beginning to mid-July.



## **Miller Waste Systems Inc.**

8050 Woodbine Ave  
Markham, Ontario L3R 2N8  
Email: millerwaste@millerwaste.ca  
Tel: 905-475-6356

- **Part 7: TESTING & COMMISSIONING**

Part 7 will start with testing by the ESA and Toronto Hydro to ensure equipment is connected as per the electrical drawings submitted in the plans and applications, and is able to technically export power to the grid. Biogas, or a similar substitute, with suitable gas quality will be brought onsite via tanker truck to commission the generation equipment. Once the facility is deemed to have met the IESO FIT Commercial Operation Date requirements, it will be shut down until biogas is available onsite.

### **PHASE 2: BALANCE OF THE FACILITY**

- **Part 1: SITE PREPARATION**

During the evaluation and preparation of the required environmental approvals several boreholes were drilled. These boreholes are to be abandoned by a duly licensed contractor in accordance with ministry guidelines to a level below the deepest site excavation prior to the commencement of work.

All underground utilities will be marked by the appropriate contractor and this will be the responsibility of the excavation contractor. This contractor shall ensure that all utilities remain marked during the course of the project.

Following utility marking the vegetation protection plan shall be implemented as per the Tree Preservation Report prepared by Branching Out Forestry Consulting Limited Dated 28 Jan 2016, submitted with this report.

The site needs to have some preliminary work completed to relocate the existing compost windrows within the site to make room for the construction activities. The Toronto Zoo will have continued access to this facility to during construction.

The existing private laneway will be regraded with and will be augmented with clean graded materials with logs from the licensed gravel pit from which they are supplied. This is to ensure that roadway continue to be usable under heavy construction use. It is currently holding water as it is not properly drained, this work is minimal as the road is otherwise in generally excellent repair.

- **Part 2: EXCAVATION**

Excavation of the site will be complete with the use of heavy equipment consisting of excavators, bulldozers and dump trucks. These works will be to relocate site material within in the confines of the site to allow for the concrete works and structural erection to take place on appropriate foundations.

Excavation and site preparation are expected to take up to a month.



## **Miller Waste Systems Inc.**

8050 Woodbine Ave

Markham, Ontario L3R 2N8

Email: millerwaste@millerwaste.ca

Tel: 905-475-6356

- **Part 3: CONCRETE WORK AND STRUCTURAL ERECTION**

Upon completion of initial site excavations materials will be brought on site and foundations will be prepared for a period of significant concrete works. These works will progress in several stages tackling the most critical structures first. It is during this phase that water taking is expected to take place to ensure that foundations are securely placed. See “Water Taking” below for details.

Upon completion of concrete works the majority of backfilling will be completed. The only areas left open will be the areas where the underground equipment needs to be placed.

- **Part 4: INSTALLATION OF UNDERGROUND WORKS**

Upon substantial completion of the concrete works underground mechanical and electrical equipment, conduits and raceways will be installed to allow for the completion of site backfilling in an expedited manner. All piping and electrical work will then be pressure tested and checked for continuity prior to backfill.

- **Part 5: SITE GRADING**

All piping and electrical work will then be backfilled with appropriate materials following the guidelines for “Construction Materials Brought Onsite” outlined below as per the electrical and mechanical drawings submitted to the TSSA and ESA, as appropriate. These materials are typically clean sand and fine gravel to prevent damage.

Final site grade shall be completed as per the grading and landscape plan submitted as part of the construction drawings submitted with this report.

- **Part 6: COMPLETION OF MECHANICAL AND ELECTRICAL WORKS**

Simultaneously with part 5, part 6 will consist of the completion of mechanical and electrical works. To allow for commissioning to begin in December or March.

- **Part 7: COMMISSIONING**

Part 7 commissioning will begin before the project is completely finished. Commissioning is scheduled to begin in December to allow the stabilization of digester biology. This requires that the digester systems, and waste gas systems be complete. The first step of this process is to begin importing the permitted organics on to the site to begin producing gas. This gas will be destroyed in the automatic flare system. When gas production is stable and the gas quality is deemed acceptable the generation equipment will be restarted.



## **Miller Waste Systems Inc.**

8050 Woodbine Ave  
Markham, Ontario L3R 2N8  
Email: millerwaste@millerwaste.ca  
Tel: 905-475-6356

- **Part 8: SUSTAINED OPERATION**

Part 8 begins with final site clean-up where all remaining site materials are removed.

### **CONSTRUCTION MATERIALS BROUGHT ON SITE**

There is a requirement for clean gravel and limestone to be brought onto site beyond the construction materials used to physically construct the project as proposed. This material is required to ensure that the foundations of these large tanks are sound, will not shift and provided added protection against leakage. These materials shall be sourced from pits licensed under the Aggregate Resources Act, R.S.O 1990, c.A.8. All materials shall be clean and free of debris. Contractors shall maintain logs of all materials brought onto site and records of the source location.

Materials will all be brought to site by truck. Concrete and aggregate trucks will be the heaviest but all trucks will follow all road weight limits no special permits are expected to be required.

### **MATERIALS GENERATED**

All material brought to site will be stored in appropriate location and manner entirely on site. During the course of construction waste materials shall be contained in dumpsters or otherwise be appropriately secured and removed by an appropriate contractor. At the completion of construction all remaining materials will be removed from the site and returned to suppliers or disposed of in an appropriate manner.

### **TEMPORARY SANITATION**

As the site is generally unmanned during operation upon completion of construction has no planned sanitation system 2 portable toilets shall be maintained onsite for the duration of construction. These portable toilets shall be maintained in a clean and sanitary manner and shall include handwashing facilities.

### **STORMWATER MANAGEMENT AND TEMPORARY EROSION AND SEDIMENT CONTROL.**

The site is currently surrounded by an earthen berm and is draining to the storm water pond in the shallow pond in the north east corner of the site. There will be no change to this during the course of the project. After the completion of construction the storm water infiltration will be improved as some of the existing limestone pack will be removed and replaced with permeable surfaces.

Precluding the above statement the stormwater management and erosion control measures shall be implemented as per the Renewable Energy Approval section D.



## **Miller Waste Systems Inc.**

8050 Woodbine Ave  
Markham, Ontario L3R 2N8  
Email: millerwaste@millerwaste.ca  
Tel: 905-475-6356

Sediment control details can be found in the stormwater management report prepared by Fisher Engineering.

### **DUST AND NOISE**

Noise is not expected to be a significant issue during construction. The nearest sensitive receptor is 400m from the construction site. Existing noise production from Meadowvale Road will have a greater impact on sensitive receptors than the construction process. For this reason it is assessed that no further noise mitigation measures are required.

Dust is not expected to be a significant issue during the construction. However if dust suppression be required the contractor is expected to spray calcium chloride.

### **VEGETATION AND HABITAT**

There is limited vegetation growing on the site at this time. Protection of the entirety of the vegetation existing on site is covered under the Arborist/Tree preservation report submitted separately with this report.

### **WATER BODIES**

There are no natural water bodies in the vicinity of the construction. Existing manmade waterbodies shall be maintained throughout the course of construction.

### **WATER TAKING**

During the course of construction it is expected that some water taking will be required in order to place some ancillary foundations. This activity has been approved under section C – WATER TAKING as part of the Renewable Energy Approval. All water taking shall be done in accordance with this document and Ministry guidelines. Water taking shall at no times exceed 100,000L per day, and all water taking shall be completed under the guidance of a qualified P.Eng or P.Geo. with appropriate silt traps in place.

### **LIGHTING**

Outdoor work is planned to be completed during the summer months during daylight hours. Therefore no job site lighting is expected to be required.

### **FUEL SPILLS**

Due to the current site conditions and its lack of vegetation and wildlife, should a fuel spill occur during the course of construction it is assessed as a normal level of environmental risk should this occur. It will be the responsibility of all contractors to have an appropriate spill response plan in place and immediately implement it in the case of a spill. The Ministry of the Environment and Climate change shall be notified immediately of any spill and appropriate remediation shall occur.





**Miller Waste Systems Inc.**

8050 Woodbine Ave  
Markham, Ontario L3R 2N8  
Email: millerwaste@millerwaste.ca  
Tel: 905-475-6356

**ARCHEOLOGICAL RESOURCES**

Under the Renewable Energy Approval process an archeological study was completed and no archaeological resources were identified on the site. Should any previously identified resources be uncovered in the course of construction the contractor shall follow the direction of Section E – ARCHAEOLOGICAL RESOURCES identified on page 12 of the approval.

**CONCLUSION**

There are no other assessed hazards or concerns that require mitigation that have been identified at this time. Stonecrest Engineering is required to make several site visits during the course of the proposed construction and will provide continued oversight together with Miller Waste to ensure that the environment and surrounding community are minimally impacted during the course of construction.