**OWPS Facility Design Overview Submission Forms and Attachments (Section D)**

**General Instructions for Completing Forms**

Proponents are requested to provide information as set out in these Proponent submission forms. Proponents may submit the electronic copy of the completed Proponent Submission Forms in either MS Word or PDF format.

All quantitative data must be submitted in SI units.

Where the form fields below do not provide sufficient space to provide the requested information, Proponents may include additional pages to provide the requested information and include a page reference in the form field indicating that the balance of the response is on an attached page.

**Reminder:** If not applicable indicate using “Nil” or “N/A” or “Not Applicable” in the space provided. Proponents should note that if a form field is left blank, the City shall assume that the information to complete the field is intentionally not supplied and shall evaluate the submission accordingly.

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| **Form** | **Title** |
| D-1 | OWPS Facility Process Narrative |
| D-2 | OWPS Facility Process Schematic |
| D-3 | OWPS Facility Technology Components |
| D-4 | OWPS Facility Mass Balance |

| **FORM D-1: OWPS Facility Process Narrative** |
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| **Item #** | **Information Requested** | **Information Provided by Proponent** |
|  | **Technology Rights:**Describe who holds the technology rights for the proposed technology and how the rights will be secured for the OWPS facility. |  |
|  | **General Description:**Provide a brief overview of the proposed OWPS Facility technology in the space below. Identify all buildings and supporting infrastructure required for the OWPS facility (e.g. access roads, scales, fencing, stormwater management facilities etc.) |  |
|  | **Processing Environment:**Identify which portions of the processes described under items 4 to 8 below, are undertaken in an indoor (within a building) or outdoor environment, including that undertaken under temporary covers.Provide a description of all buildings and temporary covers used. |  |
|  | **Proposed Organic Waste Receipt and Handling**:Describe organic waste receipt, management and any temporary storage facilities and practices (e.g. on floor or in pit).  |  |
|  | **Proposed Pre-processing System:**Describe the Pre-Processing System. Proponents should describe theproposedsequence of unit operations, type of operation, equipment used, temporary storage (if applicable), quantities and characteristics of input and output streams, processes to screen and reject unacceptable materials and to address contaminants. |  |
|  | **Proposed Processing System:**Describe the organics processing system. Proponents should describe how pre-processed organic waste is fed to the process, design capacity and dimensions of processing area, temporary storage for inputs and outputs (if applicable), how the feedstock is processed (loading, flow), equipment used, mixing or turning systems (if applicable), throughput capacity, types and quantities of additives used and process air system. |  |
|  | **Beneficial Use and Energy Product Generation:**Describe the system/approach to generate Beneficial Use and/or energy products. Proponents should describe thesequence of operations, type of operation, equipment used, types and quantities of additives used in the process, quantities and characteristics of input and output streams. |  |
|  | **Residue Processing System:**Describe the Residue Processing System. Proponents should describe thesequence of operations, type of operation, equipment used, quantities and characteristics of input and output streams, including market or disposal destinations of the output streams. |  |
|  | **Management of Odour, Dust, other Air Emissions, Noise and Nuisances during operation**:Describe the approaches that would be applied *(*design features and operational measures) to manage process air and to prevent or minimize issues associated with odour, dust (and other air emissions), noise and nuisances during all aspects of the OWPS facility operation*.* |  |
|  | **Permitting, Community and Indigenous Engagement:**Describe the approaches that will be applied to obtain required permits and to engage with the general community and Indigenous peoples and rights holders to support the OWPS Facility development and operations. |  |
|  | **Information on Utility Requirements**:Describe the utility service needs (water, sewer, natural gas, electricity) for the OWPS facility |  |
|  | **Project Development Schedule and Major Milestones:**Provide an OWPS Facility development schedule reflecting the Estimated Preliminary Schedule provided in B9.3 of the RFQ. This should include estimated timelines for: design, permitting, major phases of construction (site preparation, building construction, equipment installation, utility connections etc.), testing and commissioning. Identify estimated major milestone dates, including the milestone date when the OWPS Facility would attain full operational status (all systems tested and commissioned) and begin accepting Green Cart Program organics. |  |

| **FORM D-2: OWPS Facility Process Schematic** |
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| **Instructions for Completing FORM D-2: OWPS Facility Process Schematic** |
| Proponents should provide a process schematic diagram for the proposed OWPS Facility as an attachment to this form, based on processing 30,000 tpy of Green Cart materials from the City. This should show:* all Technology components comprising the OWPS Facility and the key unit operations performed by each Technology component corresponding to Form D-1: OWPS Facility Process Narrative and Form D-3: OWPS Facility Technology Components;
* delineate which components of the OWPS Facility that comprise each of the pre-processing, processing, and residue processing systems;
* type and design rate of material transfers based on design values (as applicable);
* all input to the process including potable water, amendment materials (bulking or otherwise), chemicals, any major process air requirements, (e.g. for aeration) not including building ventilation or machine air;
* all outputs from the process (e.g., digestate, finished compost, residue, biogas, and other energy products, odorous process air and wastewater, and other outputs as applicable based on the technology type); and,
* where separate processing lines are proposed, show key unit operations and design capacity for each processing line.

Based on the schematic, transfer the specified values to this form where indicated below. |

| **FORM D-2: OWPS Facility Process Schematic** |
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| **Item #** | **Information Requested** | **Information Provided by Proponent** |
| 1 | Design Capacity – AD Facility | [ ]  Check if this “Design Capacity – AD Facility” section is not applicable. Note that the Design Capacity for a different technology type should be included if this section is not filled out. Design Biogas production (Nm3/hour) [based on 24 hours/day] =      Methane concentration (vol. %) =      Process air (not including building ventilation or machine air) requiring treatment per tonne of organic waste processed (Nm3/tonne) =      Potable Water Use (m3/tonne feedstock) =      Wastewater generation (m3/tonne feedstock) =      Digestate production (tonnes/tonne feedstock) =      Digestate solids content (%TS) =      Residue generation (tonnes/tonne feedstock) =      Residue solids content (%TS) =      Other output (list below) (quantity/tonne feedstock): |
| 2 | Design Capacity – Composting Facility | [ ]  Check if this “Design Capacity – Composting Facility” section is not applicable. Note that the Design Capacity for a different technology type should be included if this section is not filled out. Design throughput (tonnes/year) =      Process air (not including building ventilation or machine air) requiring treatment per tonne of organic waste processed (Nm3/tonne) =      Potable Water Use (m3/tonne feedstock) =      Wastewater generation (m3/tonne feedstock) =      Finished compost production (tonnes/tonne feedstock) =      Residue generation (tonnes/tonne feedstock) =      Other output (list below) (quantity/tonne feedstock): |
| 3 | Equipment Scale-Up (or Scale-down) Factor |

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| Capacity of highest capacity pre-processing system line in OWPS Facility concept  |       [tonnes per hour] | **=** |
| Capacity of highest capacity pre-processing system line in selected Reference FacilityIdentify selected Reference Facility: |       [tonnes per hour] |
| Capacity of highest capacity processing line design in OWPS Facility concept |       [tonnes per hour] |  |
| Capacity of highest capacity processing line in selected Reference FacilityIdentify selected Reference Facility: |       [tonnes per hour] | **=** |

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| **FORM D-3: OWPS Facility Technology Components** |
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| **Item #** | **Information Requested** | **Information Provided by Proponent** |
|  | **Pre-processing Equipment:** Identify all major pieces of equipment involved in the pre-processing of feedstock materials, including equipment used for the separation of processable organics from bin liners and removal of contaminants and other non-processable materials. For each type of equipment identified, the Proponent should provide the following information as a minimum: brief description; type/manufacturer; number of units; throughput, size or rating. |  |
|  | **Processing Equipment:** Identify all major pieces of equipment involved in the processing of the feedstock material. For each type of equipment identified, the Proponent should provide the following information: type/manufacturer; model; number of units required; processing rate (tonne per hour per unit) and/or capacity; process temperature range (oC). |  |
|  | **Post-Processing/Beneficial Use/Energy Product Equipment:** Identify all major pieces of equipment involved in the post-processing of outputs and generation of Beneficial Use and/or energy products as applicable (e.g. digestate, biogas, compost). For each type of equipment identified, the Proponent should provide the following information: brief description; type/manufacturer; number of units required; throughput, size or rating. |  |
|  | **Odour Control and Treatment:** Identify all major pieces of equipment involved in the management and treatment of odour, including equipment used to manage the flow of process air, equipment used to extract and manage air from organics receiving air and equipment used to treat odorous air prior to release to the atmosphere. For each type of equipment identified, the Proponent should provide the following information: brief description, type/manufacturer; number of units required; throughput, size or rating. |  |
|  | **Process Water Treatment:** Identify all major pieces of equipment involved in the management and treatment of process water, including equipment used to treat water to meet applicable discharge limits. For each type of equipment identified, the Proponent should provide the following information: brief description, type/manufacturer; number of units required; throughput, size or rating. |  |
|  | **Residue Processing Equipment:** Identify all major pieces of equipment involved in the further processing of solid residues. For each type of equipment identified, the Proponent should provide the following information as a minimum: type/manufacturer; number of units required; rated capacity (tonnes per hour). |  |

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| **FORM D-4: OWPS Facility Mass Balance** |
| **Instructions for Completing FORM D-4: OWPS Facility Mass Balance** |
| Proponents are requested to attach a mass balance diagram for the proposed OWPS Facility based on the OWPS technology and then transfer the specified values to this form indicated below as applicable for the proposed OWPS technology. The mass balance diagram should conform to the process schematic provided in Form D-2.Proponents should provide an annual mass balance for the OWPS Technology based on processing 30,000 tonnes per year of Green Cart materials. Proponents should provide the quantities of all input and output material streams in the mass balance diagram.  |
| **Item #** | **Information Requested** | **Information Provided by Proponent** |
| 1 | Mass Balance (based on processing 30,000 tpy Green Cart materials) | (A) Green Cart Organic Waste =      (B) Other Organic Waste =      (A+B) Total Feedstock (tonnes) =      Potable Water Use (m3) =      (C) Residue disposed (tonnes) =      Residue solids content (weighted average, %TS) =      Wastewater generation (tonnes) =      Biogas production (Nm3) =      Methane concentration (weighted average, % vol.) =      Digestate production (tonnes) =      Digestate solids content (weighted average, %TS) =       Compost production (tonnes) =      Other output (list below) (tonnes) Process air (not including building ventilation or machine air) requiring treatment (Nm3) =       |
| **FORM D-4: OWPS Facility Mass Balance** |
| 2 | Calculated Values from Mass Balance Summary | Processing Rate (tonnes per operating hour) =      Proportion of Green Cart Organic Waste Processed (% wt. of feedstock = A/(A+B)) =      Methane generation (Nm3 per tonne of feedstock) =      Potable Water Use (m3 per tonne of feedstock) =      Digestate production (tonne per tonne of feedstock) =      Compost production (tonne per tonne of feedstock) =      Residue disposed (tonne per tonne of feedstock) =      Wastewater generation (m3 per tonne of feedstock) =      Other output (list below) (tonne per of tonne feedstock)  |
| **3** | **Diversion Rate Calculation**The Diversion Rate achieved is to be calculated by: Diversion Rate (%) = [(1 – C)/(A+B)] x 100% | Diversion Rate = [1 – (     ) / (      +      )] \* 100%Diversion Rate =  % |