**Reference Facility Technical Submission Forms and Attachments (Section B)**

**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** |
| B-1 | Reference Facility Identification and Contact Information |
| B-2 | Reference Facility Description |
| B-3 | Reference Facility Process Narrative |
| B-4 | Reference Facility Technology Components |
| B-5 | Reference Facility Technology vs. Proposed OWPS Facility Technology |
| B-6 | Reference Facility Feedstock Composition |
| B-7 | Reference Facility Mass Balance |
| B-8 | Reference Facility Operating History |
| B-9 | Reference Facility Product Recovery and Marketing |
| B-10 | Reference Facility Environmental Performance Summary – Odour, Dust, Noise, Nuisances |

| **FORM B-1: Reference Facility Identification and Contact Information** | | |
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| **Item #** | **Information Requested** | **Information Provided by Proponent** |
|  | Reference Facility Name |  |
|  | Address of the Reference Facility |  |
|  | Reference Facility owner name |  |
|  | Contact for owner | Name:  Address:  Telephone:  Email: |
|  | Reference Facility operator name (if different from owner) |  |
|  | Contact for operator | Name:  Address:  Telephone:  Email: |
|  | Reference Facility designer name |  |
|  | Reference Facility constructor name |  |

| **FORM B-2: Reference Facility Description** | | | |
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| **Item #** | **Information Requested** | **Information Provided by Proponent** | |
| 1 | Reference Facility name |  | |
| 2 | Provide information regarding the setting of the Reference Facility. Identify whether it is in an urban or rural area and describe surrounding land uses |  | |
| 3 | Date of commencement of commercial operation of the Reference Facility |  | |
| 4 | Number of years in continuous operation |  | |
| 5 | Reference Facility permitted processing capacity | Permitted Processing Capacity (metric tonnes per year): | |
| 6 | 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 must be included if this section is not filled out.  Design throughput (tonnes/year) =  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) = | |
| 7 | Design Capacity – Compost Facility | Check if this “Design Capacity – Composting Facility” section is not applicable. Note that the Design Capacity for a different technology type must 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) = | |
| 8 | Provide an overview of the Reference Facility project development schedule identifying the timelines for: design, permitting, major phases of construction (site preparation, building construction, equipment installation, etc.), testing and commissioning. |  | |
| 9 | Description of Reference Facility expansion and/or major upgrades (if any), including date of expansion. If none confirm Reference Facility was installed as a complete system at Date of Commencement of Commercial Operation. |  | |
| 10 | Photographs of Reference Facility exterior and processing technology components. | Information Attached (Y/N) | Title of Attachment(s) |

| **FORM B-3: Reference Facility Process Narrative** | | |
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| **Item #** | **Information Requested** | **Information Provided by Proponent** |
| 1 | Reference Facility Name |  |
| 2 | Proponents must identify the start date of the Reference Period. | Start date of Reference Period (yyyy/mm/dd): |
| 3 | Proponents must identify the End date of the Reference Period. | End date of Reference Period (yyyy/mm/dd): |
| 4 | Proponents must confirm that the duration of the Reference Period is 24 consecutive months. | Duration of Reference Period in consecutive months: |
| 5 | **General Description:**  Provide a brief overview of the Reference Facility. |  | |
| 6 | **Operating Schedule:**  Identify the normal operating schedule for processing: typical operating hours per day and days per year to calculate hours per year.  **Note:** The operating hours are times that the Reference Facility is staffed and organic waste is received and fed into the processing system. | Operating hours per day:  Operating days per year:  Operating hours per year:  Operating Hours Over the Reference Period (hours) = Hours per year x 2 years = | |
| 7 | **Processing Environment:**  Identify which portions of the processes described under items 8 to 12 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. |  | |
| 8 | **Organic Waste Receipt and Handling**:  Describe organic waste receipt, management and any temporary storage facilities and practices (e.g. on floor or in pit) and dimensions of receiving area. |  | |
| 9 | **Pre-processing System:**  Describe the Pre-Processing System. Identify thesequence and type of unit operations, equipment used, temporary storage (if applicable), dimensions of pre-processing area, quantities and characteristics of input and output streams, processes to screen and remove unacceptable materials and to address contaminants. |  | |
| 10 | **Organics Processing System:**  Describe the organics processing system. Identify the type and sequence of operations, equipment used, dimensions of processing area, temporary storage for inputs and outputs (if applicable), how the feedstock is processed (material loading, flow), mixing/turning system (if applicable), types of additives used and process air systems (not including building ventilation or machine air). |  | |
| 11 | **Beneficial Use and Energy Product Generation:**  Describe the system/approach to generate Beneficial Use and/or energy products. Describe the type andsequence of operations, equipment used, types and quantities of additives used in the process, quantities and characteristics of input and output streams, destinations of the output streams. |  | |
| 12 | **Residue Processing System:**  Describe the residue processing system. Describe the type andsequence of operations, equipment used, dimensions of residue processing area, quantities and characteristics of input and output streams, destinations of the output streams. |  | |

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| **FORM B-4: Reference Facility Technology Components** | | |
| **Instructions for Completing FORM B-4: Reference Facility Technology Components** | | |
| Proponents are requested to provide the information as set out in the table below for each technology component within the Reference Facility as described on FORM B-3. If available, Proponents should provide and attach specification sheets for each technology component within the Reference Facility as set out in the table below. | | |
| **Item #** | **Information Requested** | **Information Provided by Proponent** |
|  | **Reference Facility Name** |  |
|  | **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, provide the following information: brief description; type/manufacturer; number of units; throughput, size or rating. |  |
|  | **Processing Equipment:**  Identify all major pieces of equipment involved in the processing of feedstock materials. For each type of equipment identified, provide the following information: type/manufacturer; model; number of units; processing rate (tonne per hour per unit) and/or capacity; process temperature range (oC). |  |
| **FORM B-4: Reference Facility Technology Components** | | |
|  | **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 / Energy Products (e.g. digestate, biogas, compost). For each type of equipment identified, provide the following information as a minimum: brief description; type/manufacturer; number of units; 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, provide the following information: brief description, type/manufacturer; number of units; 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, provide the following information: brief description, type/manufacturer; number of units; 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, provide the following information: type/manufacturer; number of units; rated capacity (tonnes per hour). |  |

| **FORM B-5: Reference Facility Technology vs. Proposed OWPS Facility Technology** | | |
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| **Item #** | **Information Requested** | **Information Provided by Proponent** |
|  | Reference Facility Name |  |
|  | Describe the similarities and differences between technology components proposed for the OWPS Facility (from FORM D-3: OWPS Facility Technology Components) and the technology components used at the Reference Facility (from FORM B-4: Reference Facility Technology Components). |  |
|  | Describe the rationale for, and benefits of, any differences between the proposed OWPS Facility technology to the Reference Facility technology for each technology component. |  |

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| **FORM B-6: Reference Facility Feedstock Composition** | | | | | |
| **Instructions for Completing FORM B-6: Reference Facility Feedstock Composition** | | | | | |
| Proponents are requested to provide the information as set out in the table below regarding the types of organic feedstocks processed by the Reference Facility. In the event that any of the materials as indicated are received combined with another material type (e.g. Material 1 being combined with Material 2, 3 or 4) please indicate if that is the case and estimate the annual tonnage per material based on material composition.  Proponents should identify the municipalities from which any residentially sourced feedstock materials were provided, the source of any non-residential feedstock materials, the total quantity of feedstock materials processed by the Reference Facility over the Reference Period and provide contact information for the municipalities as indicated on the table below. | | | | | |
| **Item #** | **Information Requested** | | **Information Provided by Proponent** | | |
| 1 | Reference Facility Name | |  | | |
| 2 | Identify the start date of the 2-Year Reference Period. | | Start date of Reference Period (yyyy/mm/dd): | | |
| 3 | Identify the End date of the 2-Year Reference Period. | | End date of Reference Period (yyyy/mm/dd): | | |
| 4 | Indicate the average contamination rate by weight for unacceptable materials present in the incoming feedstock over the Reference Period | | Percentage by weight of incoming feedstock: | | |
| 5 | Provide a profile of the acceptable materials suitable for processing at the Reference Facility | | See list of Feedstock Types below. | | |
| **Feedstock Type** | | **Accepted at Reference Facility** | | **Material Source** | **Annual Tonnage over Reference Period** |
| **Material 1**: Residentially sourced food waste (e.g., food and vegetable scraps; meat, fish and bones; solid fats; dairy products; eggs and eggshells; bread and grains; plate scrapings; pet foods.) | | Y/N | |  | Year 1=  Year 2=  Additional Information: |
| **Material 2**: Residentially sourced paper products (e.g., food-soiled paper towels and napkins; used tissues; paper products; takeout bags and pizza boxes; waxed and parchment paper) | | Y/N | |  | Year 1=  Year 2=  Additional Information: |
| **FORM B-6: Reference Facility Feedstock Composition** | | | | | |
| **Material 3**: Other residentially sourced household items (e.g., wooden stir sticks, toothpicks, chopsticks; pet and human hair; shredded paper; houseplants) | | Y/N | |  | Year 1=  Year 2=  Additional Information: |
| **Material 4**: Residentially sourced compostable bags (e.g., BPI-certified compostable plastic bags, paper bags) | | Y/N | |  | Year 1=  Year 2=  Additional Information: |
| **Material 5**: Residentially sourced leaf and yard waste (e.g., grass clippings; leaves; plants; and small tree branches) | | Y/N | |  | Year 1=  Year 2=  Additional Information: |
| **Material 6**: Other residentially sourced materials not accepted in the Winnipeg Green Cart Program such as compostable plastics (other than compostable bags), pet waste, diapers and sanitary materials | | Y/N | |  | Year 1=  Year 2=  Additional Information: |
| **Material 7**: Other material (e.g. commercial/industrial materials) | | Y/N  List Materials: | |  | Year 1=  Year 2=  Additional Information: |
| **Material 8**: Other material | | Y/N  List Materials: | |  | Year 1=  Year 2=  Additional Information: |

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| **FORM B-6: Reference Facility Feedstock Composition** | |
| **Origin of Residential Feedstock Materials Processed by Reference Facility** | **Municipality Contact** |
| **Residential Feedstock Type:**  **Municipality:** | Name:  Address:  Telephone:  Email: |
| **Residential Feedstock Type:**  **Municipality:** | Name:  Address:  Telephone:  Email: |
| **Residential Feedstock Type:**  **Municipality:** | Name:  Address:  Telephone:  Email: |

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| **FORM B-7: Reference Facility Diversion Rate** | | |
| **Instructions for Completing FORM B-7: Reference Facility Diversion Rate** | | |
| Proponents are requested to provide a Mass Balance Diagram for the Reference Facility and then transfer the specified values to this form as indicated below. The Mass Balance Diagram should reflect the process details provided in FORM B-3.  Proponents should provide the total material inputs to, and outputs from, the Reference Facility over the Reference Period in the Mass Balance Diagram. Totals reported on the Mass Balance Diagram should agree with the corresponding totals reported on FORM B-6: Reference Facility Feedstock Composition and FORM B-9: Product Recovery and Marketing.  Proponents should calculate the Diversion Rate achieved by the Reference Facility over the full duration of the Reference Period and report the Diversion Rate as indicated below. | | |
| **Item #** | **Information Requested** | **Information Provided by Proponent** |
| 1 | Reference Facility Name |  |
| 2 | Operating Hours Over the Reference Period (copied from FORM B-3) |  |
| 3 | Mass Balance Summary over Reference Period (based on actuals copied from Mass Balance Diagram) | (A) Residential 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 B-7: Reference Facility Diversion Rate** | | |
| 4 | Calculated Values from Mass Balance Summary | Processing Rate (tonnes per operating hour) =  Proportion of Residential 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 tonne of feedstock) |
| 5 | **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 =       % |

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| **FORM B-8: Reference Facility Operating History** | | |
| **Instructions for Completing FORM B-8: Reference Facility Operating History** | | |
| Proponents should identify the total number of operating hours over the Reference Period, the total number of hours of scheduled and un-scheduled downtime for the Reference Facility and total downtime for the Reference Facility over the Reference Period.  Proponents should provide an explanation for periods of scheduled or unscheduled downtime for major pieces of equipment or an entire processing line that resulted in a significant reduction in processing capacity; and/or explanations for extended downtime.  Proponents should attach a description of major operational or maintenance challenges experienced by the Reference Facility during the Reference Period and how they were resolved.  Proponents should calculate the Availability Factor achieved by the Reference Facility over the full duration of the Reference Period and report the Availability Factor where indicated below.  Proponents should calculate the Average Hourly Processing Rate achieved by the Reference Facility over the full duration of the Reference Period and report where indicated below. | | |
| **Information Requested** | **Information Provided by Proponent** | |
| Reference Facility Name |  | |
| [A] Operating Hours over the Reference Period (copied from Form B-3) |  | |
| [B] Total hours of scheduled and unscheduled downtime over the Reference Period | Scheduled downtime (hours) =  Unscheduled downtime (hours) =  Total downtime (hours) = | |
| Proponents should calculate the Availability Factor.  The Availability Factor is to be calculated by  Availability Factor = (1- [B] / [A]) \* 100% | Availability Factor = [1 – (     ) /      ] \* 100%  Availability Factor =       % | |
| [C] Operating Hours Over Reference Period (copied from FORM B-3) |  | |
| [D] Average Hourly Processing Rate Over Reference Period (tonnes per hour) | [D] = [Total tonnage within reference period]/[C] = | |
| Explanations of downtime over the Reference Period | Information Attached (Y/N) | Title of Attachment |
| Major operational or maintenance challenges over the Reference Period | Information Attached (Y/N) | Title of Attachment |

| **FORM B-9: Reference Facility Product Recovery and Marketing** | | |
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| **Instructions for Completing FORM B-9: Reference Facility Product Recovery and Marketing** | | |
| Proponents should identify all products recovered by the Reference Facility that have been successfully marketed for beneficial uses over the Reference Period, where indicated on the table below. Proponents should provide contact information for the beneficial use markets to which products recovered from the Reference Facility were supplied.  *For AD facilities*, Proponents should provide a description of the digestate, beneficial use products and energy products generated by the reference facility. Proponents should provide a description of the digestate and other product end-use over Reference Period, including a description of how the digestate and other beneficial use products are marketedand information on all applicable regulatory requirements for land application of materials in that jurisdiction. Proponents should provide analytical results (especially for foreign materials) of samples of digestate and beneficial use products, which provide evidence of compliance with applicable rules/guidelines for the use of these materials in the receiving jurisdiction. Proponents should provide a description of how energy products are marketed and information on all applicable regulatory and industry requirements in that jurisdictions that govern the use of these products.  *For Compost facilities*, Proponents should provide a description of the compost and compost quality and any other beneficial use products generated by the reference facility. Proponents should provide a description of the compost and beneficial end-use of products over the Reference Period, including a description of how the compost is marketed and information on all applicable regulatory requirements that apply to the quality and use of compost in that jurisdiction. Proponents should provide analytical results (including inorganic contaminants) of samples of compost, representing the full extent of the Reference Period (beginning, middle and end), which provide evidence of compliance with compost requirements/guidelines for unrestricted use in the Reference Facility jurisdiction. | | |
| **Information Requested** | **Information Provided by Proponent** | |
| Reference Facility Name |  | |
| Description of the product use(s) | Information Attached (Y/N) | Title of Attachment |
| Analytical results of product samples | Information Attached (Y/N) | Title of Attachment |

| **FORM B-9: Reference Facility Product Recovery and Marketing** | | |
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| **Information Requested and Provided by Proponent** | | |
| **Product** | **Description, Quality Requirements, Quality Characteristics, Quantity Marketed During Reference Period, Description of Market including Material quality requirements for that Market** | **Contact for Product Markets** |
|  |  | Name:  Address:  Telephone:  Email: |
|  |  | Name:  Address:  Telephone:  Email: |
|  |  | Name:  Address:  Telephone:  Email: |
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| **FORM B-10: Reference Facility Environmental Performance Summary – Odour, Dust, Noise, Nuisances** | | | | |
| **Reference Facility Name** | |  | | |
| **Regulatory Agency with Jurisdiction contact information** | |  | | |
| **FORM B-10: Reference Facility Environmental Performance Summary – Odour** | | | | |
| **Item #** | **Information Requested** | | **Information Provided by Proponent** | |
|  | Describe the design features, including technologies used in-place at the Reference Facility intended to prevent or minimize the generation of odourous process air requiring treatment. | | Information Attached (Y/N) | Title of Attachment |
|  | Identify the type, number and location of sensitive odour receptors within one kilometre of the Reference Facility.  Sensitive receptors include residences (including facilities where people sleep, e.g. hotel/motel, camping grounds, retirement homes, etc.) and sensitive land use (including hospitals, childcare facilities, long-term care facilities, churches and community centres, parks). | | Information Attached (Y/N) | Title of Attachment |
|  | Provide Reference Facility permit limits for odour emissions. | | Information Attached (Y/N) | Title of Attachment |
|  | Identify any odour incidents and provide explanations as to the source of the odour and now such incidents were resolved.  Identify any history of orders and/or directives from relevant regulatory agencies with jurisdiction. | | Information Attached (Y/N) | Title of Attachment |
| **FORM B-10: Reference Facility Environmental Performance Summary – Dust** | | | | |
| **Item #** | **Information Requested** | | **Information Provided by Proponent** | |
|  | Describe the design features, including technologies used in-place at the Reference Facility intended to prevent or minimize the generation of dust. | | Information Attached (Y/N) | Title of Attachment |
|  | Identify any dust incidents and provide explanations as to the source of the dust and now such incidents were resolved.  Identify any history of orders and/or directives from relevant regulatory agencies with jurisdiction. | | Information Attached (Y/N) | Title of Attachment |
| **FORM B-10: Reference Facility Environmental Performance Summary – Noise** | | | | |
| **Item #** | **Information Requested** | | **Information Provided by Proponent** | |
|  | Describe the design features, including technologies used in-place at the Reference Facility intended to prevent or minimize the generation of noise and vibrations. | | Information Attached (Y/N) | Title of Attachment |
|  | Identify the type, number and location of sensitive noise receptors within 1 kilometre of the Reference Facility. Sensitive receptors include residences (including facilities where people sleep, e.g. hotel/motel, camping grounds, retirement homes, etc.) and sensitive land use (including hospitals, childcare facilities, long-term care facilities, churches and community centres, parks). | | Information Attached (Y/N) | Title of Attachment |
|  | Provide Reference Facility permit limits for noise emissions. | | Information Attached (Y/N) | Title of Attachment |
|  | Identify any noise incidents and provide explanations as to the source of the noise and now such incidents were resolved.  Identify any history of orders and/or directives from relevant regulatory agencies with jurisdiction. | | Information Attached (Y/N) | Title of Attachment |
| **FORM B-10: Reference Facility Environmental Performance Summary – Nuisances** | | | | |
| **Item #** | **Information Requested** | | **Information Provided by Proponent** | |
|  | Describe the design features, including technologies used in-place at the Reference Facility intended to prevent or minimize nuisances (e.g. vermin, insects, litter). | | Information Attached (Y/N) | Title of Attachment |
|  | Identify any nuisance incidents and provide explanations as to the source of the nuisance and now such incidents were resolved.  Identify any history of orders and/or directives from relevant regulatory agencies with jurisdiction. | | Information Attached (Y/N) | Title of Attachment |