

# LICENCE

Licence No. / Licence n° 2760

Issue Date / Date de délivrance April 3, 2007

In accordance with The Environment Act (C.C.S.M. c. E125) /  
Conformément à la Loi sur l'environnement (C.P.L.M. c. E125)

Pursuant to Section 10(1) / Conformément au Paragraphe 10(1)

**THIS LICENCE IS ISSUED TO: / CETTE LICENCE EST DONNÉE À :**

**RES/OP TECHNOLOGIES INC.;**

**"the Licence"**

for the construction and operation of the Development being a 220 kilogram per hour gasification plant, located at the NW quarter of Section 12, Township 12, Range 4 WPM in the Rural Municipality of Portage la Prairie, in accordance with the Proposal filed under The Environment Act on December 14, 2006 and subsequent information supplied in a letter on February 9, 2007, subject to the following specifications, limits, terms and conditions:

**DEFINITIONS**

In this Licence,

**"accredited laboratory"** means facilities accredited by the Standard Council of Canada (SCC), or facilities accredited by another accrediting agency recognized by Manitoba Conservation to be equivalent to the SCC, or facilities which can demonstrate to Manitoba Conservation, upon request, that quality assurance/quality control (QA/QC) procedures are in place equivalent to accreditation based on the Canadian Standard Can/CSA-Z753, extension of the international standard ISO 9000, Guide 25;

**"affected area"** means a geographical area, excluding the property of the Development;

**"approved"** means approved by the Director in writing;

**"biomedical waste"** means waste generated by human or animal health care facilities, medical or veterinary research and teaching establishments, health care

**\*\*A COPY OF THE LICENCE MUST BE KEPT ON SITE AT THE DEVELOPMENT  
AT ALL TIMES\*\***

teaching establishments, clinical testing or research laboratories, and facilities involved in the production or testing of vaccines and are human anatomical waste, animal waste, microbiological laboratory waste, human blood and body fluid waste and waste sharps;

**"condensable particulate matter (CPM)"** means material that is vapour phase at stack conditions, but which condenses and/or reacts upon cooling and dilution in the ambient air to form solid or liquid particulate matter immediately after discharge from the stack;

**"dangerous goods"** means any product, substance or organism designated in the regulations, or conforming with the criteria set out in the regulations, or in any regulation adopted in accordance with The Dangerous Goods Handling and Transportation Act, and includes hazardous wastes;

**"Director"** means an employee so designated pursuant to The Environment Act;

**"Environment Officer"** means an employee so designated pursuant to The Environment Act;

**"filterable particulate matter"** means material that is directly emitted by a source as a solid or liquid at stack or release conditions and is captured on the filter of a stack test train;

**"gasification"** means the processes occurring in the Orverter™ Pilot Plant whereby biomass is converted into various by-products, including combustible gases;

**"hazardous waste"** means any substance or group of substances so designated by the regulations, or conforming to criteria set out in the regulations;

**"litter"** means animal and agricultural wastes, domestic animal wastes, liquid and semi-liquid wastes, dead animals, ashes, garbage, construction and demolition wastes, industrial refuse, rubbish, solid wastes or refuse, motor vehicle parts, scrap metal, abandoned or unattended shopping carts and special wastes, including, but not limited to street cleanings, containers, packages, bottles, cans or parts thereof, and any discarded articles, products or goods of manufacture;

**"maximum rate"** means the determined maximum mass of feedstock material processed over a stated period of time at the Development and which may be used as reference for other determinations for limits, terms or conditions of this Licence;

**"noise nuisance"** means an unwanted sound, in an affected area, which is annoying, troublesome, or disagreeable to a person:

- a) residing in an affected area;
- b) working in an affected area; or
- c) present at a location in an affected area which is normally open to the members of the public;

if the unwanted sound

- d) is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director, and within a 90 day period, from 5 different persons falling within clauses a), b), or c), who do not live in the same household; or
- e) is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses a), b), or c), and the Director is of the opinion that if the unwanted sound had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90 day period from 5 different persons who do not live in the same household;

**"normal rate"** means the determined average mass of feedstock material processed or RDF gasified over a stated period of time at the Development and which may be used as reference for other determinations for limits, terms or conditions of this Licence;

**"odour nuisance"** means a continuous or repeated odour, smell or aroma, in an affected area, which is offensive, obnoxious, troublesome, annoying, unpleasant, or disagreeable to a person:

- a) residing in an affected area;
- b) working in an affected area; or
- c) present at a location in an affected area which is normally open to the members of the public;

if the odour, smell or aroma

- d) is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director and within a 90 day period, from 5 different persons falling within clauses a), b), or c), who do not live in the same household; or
- e) is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses a), b), or c), and the Director is of the opinion that if odour, smell of aroma had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90 day period from 5 different persons who do not live in the same household;

**"opacity"** means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background;

**"particulate matter"** means any finely divided liquid or solid matter other than water droplets;

**"particulate residue"** means that part or portion of an atmospheric emission which is deposited onto a surface;

**"PM<sub>2.5</sub>"** means particulate matter with a mean aerodynamic diameter equal to or less than 2.5 microns;

"**PM<sub>10</sub>**" means particulate matter with a mean aerodynamic diameter equal to or less than 10 microns;

"**point source**" means any point of emission from the Development where pollutants are emitted to the atmosphere by means of a stack;

"**QA/QC**" means quality analysis/quality control;

"**sanitary wastes**" means human body, toilet, liquid, waterborne culinary, sink or laundry waste;

"**sewage**" means human body, toilet, liquid, waterborne culinary, sink or laundry waste;

"**shutdown**" means that period of time, not to exceed one hour, between commencement of the stoppage of the gasification process and the cessation of emissions of gas from the thermal reactor module;

"**specified risk materials**" means the skull, brains, trigeminal ganglia (nerves attached to the brain), eyes, tonsils, spinal cord and dorsal root ganglia (nerves attached to the spinal cord) of cattle aged 30 months or older, and the distal ileum (portion of the small intestine) of cattle of all ages;

"**stack**" means a duct, pipe, chimney, vent, opening or other structure through which pollutants are emitted to the atmosphere;

"**total particulate matter (Total PM)**" means the combined mass of filterable and condensable particulate matter;

"**feedstock material**" means the approved material received at the Development for processing; and

"**wastewater**" means any liquid containing a pollutant as defined in The Environment Act, associated with or resulting from the Development which is discharged into the environment.

### GENERAL TERMS AND CONDITIONS

This section of the Licence contains requirements intended to provide guidance to the Licencee in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

1. The Licencee shall implement a high standard of equipment maintenance and good housekeeping and operational practices with respect to the Development, at all times.

2. The Licencee shall reduce the production and dissemination of wastes by initiating and maintaining waste reduction and waste recycling programs.
3. The Licencee shall, upon the request of the Director and in addition to any of the limits, terms or conditions specified in this Licence:
  - a) sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, treatment, handling, disposal or emission systems, for such pollutants or ambient quality, aquatic toxicity, leachate characteristics and discharge or emission rates, for such duration and at such frequencies as may be specified;
  - b) determine the environmental impact associated with the release of any pollutants from the said Development; or
  - c) provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and analytical procedures being used, bioassay data, flow rate measurements and such other information as may from time to time be requested.
4. The Licencee shall, unless otherwise specified in this Licence:
  - a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in the most current edition of Standard Methods for the Examination of Water and Wastewater or in accordance with equivalent preservation and analytical methodologies approved by the Director;
  - b) carry out all sampling of, and preservation and analyses on, soil and air samples in accordance with methodologies approved by the Director;
  - c) ensure that all analytical determinations are undertaken by an accredited laboratory; and
  - d) report the results to the Director within 60 days of the samples being taken.
5. The Licencee shall provide to the Director, upon request, all information required under this Licence, in writing and in such form and content (including number of copies), as may be specified by the Director.
6. The Licencee shall ensure that a stack or stacks including all necessary sampling facilities are provided for the sampling of air emissions at the Development. The stack or stacks shall be provided:
  - a) at a location(s) and within a time frame satisfactory to the Director; and
  - b) to the specifications and in accordance with the most recent version of Manitoba Conservation Guideline No. 97-05, *Guideline for Stack Sampling Facilities*, unless otherwise approved by the Director.
7. The Licencee shall submit, within 30 days of the issuance of this Licence, a detailed plan which is acceptable to and approved by the Director, for the sampling

and analysis of potential air pollutants, released as stationary point and fugitive emissions, including those compounds listed in Attachment 'A' to this Licence. The plan shall identify the rationale for the sampling; the ways and means by which the sampling program will be implemented including any special measures or methods which would be necessitated by influencing factors such as unfavourable weather conditions, the need for large or additional sample volumes, the need for multiple sampling runs; the methods used for the sampling and the analysis for each compound; the detection level to be attained; a comprehensive QA/QC program, and other items as may be identified by the Director.

8. The Licencee shall perform all stack sampling in accordance with the most recent version of Manitoba Conservation Report No. 96-07, *Interim Stack Sampling Performance Protocol*, unless otherwise approved by the Director.
9. The Licencee shall arrange the scheduling of the sampling program submitted pursuant to Clause 7 of this Licence such that a representative of Manitoba Conservation is available to monitor and audit the implementation of the sampling program.
10. The Licencee shall complete the sampling of emissions according to the approved plan submitted pursuant to Clause 7 of this Licence, after the submission of the determined rates of processing submitted pursuant to Clause 30 of this Licence, but within 60 days of the commencement of operation of the Orverter™ Pilot Plant at the Development, unless otherwise approved by the Director.
11. The Licencee shall submit a report, for the approval of the Director, of the completed sampling and analysis plan approved pursuant to Clause 7 of this Licence, within 30 days of the receipt of the analytical results of that sampling plan. The report shall contain at a minimum:
  - a) the raw data collected;
  - b) a discussion of the sampling and analytical portions of the program including any anomalies of sampling and analysis; and
  - c) a discussion of the significance of the data gathered with specific attention to:
    - i) the significance for potential acute and chronic impacts to health or environment from exposure to concentrations of the compounds detected;
    - ii) the need for risk assessment of the impact of emissions;
    - iii) the need for the establishment of ambient air monitoring stations;
    - iv) the need for dispersion modelling of emissions;
    - v) results and conclusions of the QA/QC program; and
    - vi) other issues as may be determined by the Director.
12. The Licencee, upon the written request of and in a timeframe stipulated by the Director, shall comply with any air emission or ambient air quality criteria

specified by the Director for any pollutant of concern to the Director which has been identified pursuant to Clauses 3 or 11 of this Licence.

13. The Licencee shall:

- a) within 30 days of the date of issuance of this Licence, commence consultations with Manitoba Conservation respecting the undertaking of air dispersion modelling of all the air emissions being released by the Development, whereby:
  - i) the methodology shall utilize the U.S. EPA AERMOD air dispersion model;
  - ii) meteorological data representative of the area shall be used;
  - iii) emission factors shall be based on source sampling of the Orverter™ Pilot Plant on site;
  - iv) the assessment of concentrations shall focus on off-site receptors within 3 kilometres of the Development;
  - v) the pollutants to be modeled shall include those compounds listed in Attachment 'A' to this Licence;
  - vi) Ontario air quality criteria are used for those air pollutants for which Manitoba has no criteria;
- b) complete the air dispersion modelling within a timeframe determined by the Director; and
- c) submit a report, that is satisfactory to the Director, within 90 days of the completion of the modelling exercise, outlining descriptions of:
  - i) the air dispersion modelling methodology utilized;
  - ii) all the air emission sources (including odour);
  - iii) the receptors (i.e. a listing of residences and other potential receptors within a 3 km radius of the Development);
  - iv) the local meteorology;
  - v) any modelling assumptions made;
  - vi) assessed background air quality levels; and
  - vii) the modelling results versus the applicable air quality criteria;together with recommendations, and a proposed implementation schedule, for mitigating, or for further evaluating, those air pollutants determined to be in non-conformance with applicable air quality criteria.

### LIMITS, TERMS AND CONDITIONS

#### **Respecting Feedstock Receipt and Storage**

14. The Licencee shall only accept at the Development the following feedstock material which is intended for processing:
  - a) Untreated and unassembled wood;
  - b) Sanitary waste generated on site;

- c) Contents of the on site sewage holding tank;
  - d) Livestock manure and mortalities.
15. The Licencee shall only store or accumulate at the Development the following feedstock material which is intended for processing:
- a) Untreated and unassembled wood;
  - b) Office waste generated on site;
  - c) Contents of the on site septic tank.
16. The Licencee shall not accept dangerous goods or hazardous waste at the Development, at any time.
17. The Licencee, notwithstanding Clause 16 of this Licence, shall remove all dangerous goods or hazardous waste from the feedstock material prior to processing, and shall properly segregate, store and dispose of the dangerous goods in a manner approved in writing by the Director.
18. The Licencee shall not store any feedstock material within 100 metres of a surface watercourse, surface water body, spring, or well.
19. The Licencee shall not accept biomedical waste at the Development at any time.
20. The Licencee shall not allow litter beyond the property boundaries of the Development resulting from the transportation, storage or processing of feedstock material at the Development.
21. The Licencee shall immediately remove any feedstock material which has been improperly deposited at the Development or along any roadway allowances or ditches within 20 metres of the property boundaries fronting or adjacent to the Development.
22. The Licencee shall not allow the accumulation on site of any material found unsuitable for processing in the gasification plant.

#### **Respecting Feedstock Material Recordkeeping**

23. The Licencee shall account for and record all feedstock material received at the Development on a 24 hour basis and shall maintain the most recent 24 months of records at the development. This 24 hour period shall begin at 12:00 am. The record shall identify for each day that feedstock material is received:
- a) the type of feedstock material received;
  - b) the date of receipt of the feedstock material; and
  - c) the 24 hour period gross mass of the feedstock material received in tonnes.
24. The Licencee shall account for and record all feedstock material gasified at the Development on a 24 hour basis and shall maintain the most recent 24 months of records at the development. This 24 hour period shall begin at 12:00 am. The record shall identify for each day that feedstock material is processed:



- a) the type of feedstock material processed;
  - b) the date of processing of the feedstock material; and
  - c) the 24 hour period gross mass of the feedstock material gasified in tonnes.
25. The Licencee shall submit to the Director, upon written request of the Director, monthly summaries of the information required by Clauses 23 and 24 of this Licence by the last day of the following month.

**Respecting Feedstock Material Processing**

26. The Licencee shall not process livestock manure, mortalities, or sewage holding tank contents until after such time that the Orverter™ Pilot Plant has demonstrated satisfactory performance in the processing of untreated and unprocessed wood and office waste generated at the development.
27. The Licencee shall notify the Director in writing, of the intention to commence operations, at least 10 working days prior to the commencement of processing of feedstock material at the Development.
28. The Licencee shall submit to the Director in writing, the date of the commencement of processing of feedstock material at the Development within five days after that commencement.
29. The Licencee shall not incorporate the use of any fossil fuels in the processing of feedstock materials and in the general operation of the Orverter™ Pilot Plant.

**Respecting the Determination of Processing/Gasification Rates**

30. The Licencee shall determine a normal rate and a maximum rate for the processing of feedstock material not later than 60 days after the commencement of the operation of the Orverter™ Pilot Plant at the Development.
31. The Licencee shall submit to the Director the rates determined by Clause 30 of this Licence, showing all data and calculations as to how these rates were determined. The rates shall be stated in kilograms or tonnes of feedstock material processed as:
- a) a monthly average;
  - b) a daily and hourly average as calculated from the monthly average;
  - and
  - c) a maximum hourly.

**Respecting Ash Management**

32. The Licencee shall sample a representative portion of ash generated at the facility:
- a) a minimum of once per month for the first six months for each feedstock material processed after commencement of processing feedstock material at the Development; and

- b) quarterly thereafter for each type of feedstock, unless otherwise required by the Director.
33. The Licencee shall have the ash samples collected pursuant to Clause 32 of this Licence analysed by an accredited laboratory to determine:
- a) toxicity in accordance with the most recent edition of Environment Canada, Environmental Protection Service test method EPS 1/RM11, "*Biological Test Method: Acute Lethality Test Using Daphnia spp.*"; and
  - b) leachate characteristics for compounds listed in Table 1 of Schedule B of Manitoba Regulation 282/87 and copper, nickel, and zinc.
34. The Licencee shall submit a report of the analyses conducted pursuant to Clause 33 of this Licence to the Director within 15 days of their receipt.
35. The Licencee shall store ash at the site in a manner that prevents fugitive dust emissions from being generated and prevents the ash from becoming a hazard.
36. The Licencee shall not dispose of ash generated at the Development which is characterized as a hazardous waste without written approval from the Director.
37. The Licencee shall dispose of ash only at approved waste disposal grounds, unless otherwise approved by the Director.
38. The Licencee shall determine and record the mass and volume of all ash generated at the Development on a weekly basis and shall maintain the most recent 24 months of records at the Development.

#### **Respecting Air Emissions**

39. The Licencee shall not emit from the Development:
- a) particulate matter in any air emission that:
    - i) exceeds 0.23 grams per dry standard cubic metre calculated at 25 degrees Celsius and 760 millimetres of mercury, corrected to 12 percent carbon dioxide for processes involving combustion, from any point source of the Development;
    - ii) exhibits a visible plume with an opacity of greater than 5 percent at any point beyond the property line of the Development; or
    - iii) results in the deposition of visible particulate residue at any time beyond the property line of the Development; or
  - b) particulate matter from any point source with an opacity that equals or exceeds:
    - i) 20 percent as the average of any 24 consecutive opacity observations taken at 15 second intervals;
    - ii) 20 percent for more than 16 individual opacity observations within any 1 hour period; or
    - iii) 40 percent for any individual opacity observation.

40. The Licencee shall not cause or permit a noise nuisance to be created as a result of the construction, operation, or alteration of the Development, and shall take such steps as the Director may require to eliminate or mitigate a noise nuisance.
41. The Licencee shall not cause or permit an odour nuisance to be created as a result of the construction, operation, or alteration of the Development, and shall take such steps as the Director may require to eliminate or mitigate an odour nuisance.

#### **Respecting Decommissioning**

42. The Licencee shall submit a decommissioning plan for the Development, suitable to the Director, prior to commencement of operation at the Development.
43. The Licencee shall remove any or all feedstock material or dangerous goods stored at the Development, upon written request of and in a manner approved by the Director.
44. The Licencee shall decommission and remediate the Development, if so ordered by and to the satisfaction of the Director.

#### **Respecting Emergency Planning**

45. The Licencee shall submit to the Director for approval, prior to operation of the Development, a contingency plan that addresses alternate plans for the management of feedstock materials collected at the Development if for any reason the gasification plant can not process the feedstock materials for an extended period of time.
46. The Licencee shall submit to the Director for approval, prior to operation of the Development, a contingency plan, in accordance with the Manitoba Industrial Accidents Council (MIAC) *Industrial Emergency Response Planning Guide*, outlining procedures to be used in the event of a leak, spill, fire, or other hazardous condition at the Development.

#### **Respecting Energy Generation**

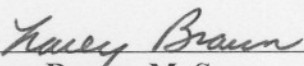
47. The Licencee shall not endeavour to undertake energy generation processes under the authority of this license, being a Class 1 development. The Licencee shall be aware that energy generation requires a Licence for a Class 2 development.

### **REVIEW AND REVOCATION**

- A. The Director shall review the specifications, limits, terms, and conditions set out in this Licence on the anniversary date of this Licence or at such other frequency as determined by the Director.

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- B. This Director may revoke this Licence within one year from the date of its issuance, if the Director is not satisfied, for any reason, with the progress which is being made at the Development.
- C. If, in the opinion of the Director, the Licencee has exceeded or is exceeding or has or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Director may, temporarily or permanently, revoke this Licence.
- D. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new Proposal pursuant to Section 11 of The Environment Act.

  
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**Tracey Braun, M. Sc.**  
**Director**  
**Environment Act**

**Client File No.: 5240.00**

**Attachment 'A' To Environment Act Licence No. 2760**

**Compounds to be Sampled in Air Emissions**

Particulate Matter (CPM, TSP; PM <sub>10</sub> ; PM <sub>2.5</sub> )	Lead (Pb)
Hydrogen Chloride (HCl)	Cadmium (Cd)
Carbon Monoxide (CO)	Mercury (Hg)
Carbon Dioxide (CO <sub>2</sub> )	Chromium (Cr)
Sulphur Dioxide (SO <sub>2</sub> )	Nickel (Ni)
Nitrogen Oxides (NO <sub>x</sub> as NO <sub>2</sub> )	Odour
Volatile Organic Compounds (VOCs)	Temperature (Celsius)
Arsenic (As)	Polyaromatic Hydrocarbons (PAHs)