

REPORT

Economic Assessment -
Technical Study Report

DURHAM YORK
RESIDUAL WASTE EA STUDY

REPORT NO. 1009497

EXECUTIVE SUMMARY

Durham and York Regions (the Regions) have partnered to undertake a joint Residual Waste Planning Environmental Assessment (EA) Study. Both Regions are in need of a solution to manage the residual solid waste that remains after diversion. The Regions are working together to address the social, economic, and environmental concerns through an Environmental Assessment (EA) Study process to examine potential long-term residual waste management alternatives.

This Report entitled *Economic Assessment – Technical Study Report* has been prepared to assess the potential economic related effects associated with the development of a Proposed Thermal Treatment Facility (the Facility) on the Proposed Thermal Treatment Facility Site (the Site), potential mitigation required, and net effects. Evaluations were completed for two (2) design capacity scenarios for the Facility. These are the initial design capacity of 140,000 tonnes per year (tpy) (140,000 tpy scenario) and a maximum design capacity of 400,000 tpy (400,000 tpy scenario). This Report will form part of the supporting documentation and materials for the assessment of the environmental effects of the Undertaking in the EA Study.

The initial phase of the economic assessment was a baseline study which describes the existing economic environment within the Regions (the Regional Economic Study Area or RESA) and highlights the business and agricultural activities within 1 km of the Site, or the Local Economic Study Area (LESA).

The Economic Assessment assesses the economic effects of the Project during construction, operations, and post-closure using the following economic, financial, and socio-economic measures and indicators:

Economic and Financial Measures	Indicator	Methodology
Employment levels	<ul style="list-style-type: none"> ▪ Direct employment ▪ Indirect employment ▪ Induced employment 	<ul style="list-style-type: none"> ▪ Estimated labour force directly hired by Covanta. ▪ Indirect employment during construction period: Use of Statistics Canada Input-Output Model multiplier based on 2.84 person-years of employment resulting from \$1 million in capital expenditures. ▪ Indirect employment during operations period: Use of Statistics Canada Input-Output Model multiplier based on 0.7 indirect jobs created for every one direct job. ▪ Use of Ministry of Agricultural, Food and Rural Affairs multiplier (Ministry of Agricultural, Food and Rural Affairs, 2007), of one induced person-year of employment for every five direct or indirect person-years of employment.

Aggregate wages and salaries	<ul style="list-style-type: none"> Wages and salaries 	<ul style="list-style-type: none"> Estimated wages and salaries identified by Covanta, 2009.
Effects on Property Value	<ul style="list-style-type: none"> Property Value 	<ul style="list-style-type: none"> Review of Property Value Studies (North America and Europe).
Municipal revenues and expenditures	<ul style="list-style-type: none"> Tax base Cost of municipal services Project expenditures 	<ul style="list-style-type: none"> Estimated payment in lieu of taxes included in Host Community Agreement. Estimated use of/demand for municipal services by construction and operational labour force. Total project expenditures and business case (Covanta 2009, Deloitte and Touche LLP, 2008).
Socio-Economic Measures	Indicator	Methodology
Effects on existing businesses	<ul style="list-style-type: none"> Displacement of businesses and agricultural farms Disruption to use and enjoyment of businesses and agricultural farms 	<ul style="list-style-type: none"> Determination of the number of businesses and agricultural farms that would be displaced. Review of potential physical effects (noise, traffic, etc) of the Project in the LESA.
Business opportunities	<ul style="list-style-type: none"> Demand for goods and services 	<ul style="list-style-type: none"> Estimation of the potential demand for local goods and services based on Covanta proposal (Covanta 2009).

A summary of the economic effects relating to the Project follows.

Construction

Construction of the Facility is expected to begin in 2010 and continue for approximately three years (30 to 33 months), ending in 2013. During construction, the actual number of workers employed and the make-up of those employed would vary over time as the Facility goes through the various construction phases. Peak labour demands are anticipated at 50 full-time employees in 2010, 150 in 2011, and 200 in 2012-2013. On average, it is expected that 300 to 400 person-years (equivalent to a full-time position for one year) of direct employment would be generated over the construction period. Local hiring will be maximized during the construction period providing work for existing tradespersons and labourers within the Region. Trades that could be provided locally include pipefitters, electricians, ironworkers, millwrights and carpenters.

It is anticipated that up to half of the total construction cost of the Facility of \$236 million, or up to \$118 million, would be spent on locally/Regionally sourced labor, goods and services (Covanta, 2009).

Along with the direct employment associated with onsite construction, capital investment in the Project is expected to generate or sustain an estimated 534 indirect person-years of employment.

During the construction period 167 to 187 person-years of induced employment is expected to be generated or sustained through the purchase of goods and services by the direct and indirect labour force involved in the Project. Examples of the categories of induced jobs which may be created in the Regional Economic Study Area (RESA) include financial services, social services, retail, and transportation.

A summary of the potential person-years of local/regional employment (both total and annual) estimated for the construction period of the Project is as follows:

Employment Type	Estimated Total Person-Years Over Construction Period	Estimated Average Annual Person-Years Construction Period
Direct	300 to 400	120 to 160
Indirect	534	214
Induced	167 to 187	67 to 75
Total	1,001 to 1,121	401 to 449

During the construction period, it is estimated that the average worker wage would be \$54 (CDN) per hour. These wages are higher than the average hourly wage rates in Ontario for the construction or utilities sectors of \$35.58 and \$25.47 respectively (Statistics Canada, Survey of Employment Payrolls and Hours, 2008). Using an average number throughout the construction period of 50 to 200 full-time employees (it is expected the number of workers would vary throughout this period), working an average of 40 hours per week, this represents a total of approximately \$5.6 to \$22.4 million (CDN) in direct wages and salaries over the 30 to 33 month construction period.

In regards to impacts to the tax base related to the demand for local or regional services, the average annual person-years (401 to 449) of local/regional employment during construction is most likely to be filled by existing local/regional residents and potential new residents in Durham Region and is not expected to result in any increased demands on local or regional services.

No businesses are located within the Site boundary and thus no businesses will be displaced during construction. None of the 11 businesses and three farms currently operating in the Local Economic Study Area will be displaced as a result of the Facility.

It is anticipated that there will be minimal disruption to the use and enjoyment of businesses and agricultural farms within the LESA during construction. Potential disruptions would be caused by physical effects from noise and visual aesthetics, however they are expected to be temporary and short-term in duration.

It is expected that qualified local contractors and businesses would see an increase in demand for their products and services from the Project during construction.

Operations

During the operational period, the Project would directly employ an estimated 33 full-time equivalents or 33 person-years annually. The new employment positions could include: management (~4), safety, environmental compliance, operations (~16, i.e. shift supervisors, control room operator, operations crews), maintenance (~8), refurbishment, back up operations, waste transport, and administration (~5) (Covanta, 2009).

Along with the direct employment associated with operations, the Project is expected to generate or sustain an estimated 23 indirect full-time equivalent workers annually. These could be either newly created positions or current positions that are sustained by new demand for services. According to the Covanta proposal submission, \$10-14 million a year will be spent on locally/Regionally sourced labor,

goods and services during operations. Direct and indirect employment during operations of the Project in the local/Regional area would generate or sustain approximately 11 person-years of induced employment annually.

It is expected that qualified local contractors and businesses could see an increased demand for their products and services from the Project during operations.

A summary of the potential person-years of employment estimated for the operational period of the Project is as follows:

Employment Type	Estimated Average Annual Person-Years During Operations
Direct	33
Indirect	23
Induced	11
Total	67

Total annual labour costs, including salaries, wages and benefits, from the Project during operations, are expected to be approximately \$5 million (CDN) per year (Covanta, 2009).

In regards to the potential effect of the Project on the Regional tax base associated with the cost of the Facility that could be passed onto Regional taxpayers, expenditures during operations of the Facility are anticipated to be \$14.67 million per year¹, excluding revenues from electricity, sale of Greenhouse Gas credits, and ferrous and non-ferrous metal recovery. Annual electricity revenues are anticipated to be \$8.59 million. This is assuming a fixed power purchase price of 8 cents per kilowatt hour, and a waste throughput of 140,000 tpy. Revenue opportunities may also be available through the sale of carbon credits on carbon markets. If revenues from the sale of electricity, Greenhouse Gas credits, and ferrous and non-ferrous metals are included in the operating costs, it is anticipated that operating costs for the Project will be less than sending the waste to a landfill in Ontario (Deloitte and Touche LLP, 2008).

In regards to potential effects on property values, recent European experiences indicate that Thermal Treatment Facilities appear to have minimal to no measurable impacts on the value or ability to sell property in areas around such facilities. There are indications that in the local area around Thermal Treatment Facilities there may be a potential short-term effect on property value largely as a result of the perceived effect of waste facilities, which return to normal once it is clear that there are no long-term physical effects. The Project has the potential to have either a neutral or positive effect on property value in the immediate vicinity of the Site within the Clarington Energy Business Park, given the investment in infrastructure (road access, district heating and cooling) and depending on the public perception of risk associated with the Facility. Provisions for district heating and cooling have been considered in the design of the Facility and estimates generated in the *Energy and Life Cycle Assessment - Technical Study Report* indicate that the Project could provide for a portion of the heating and cooling requirements for the full build-out of the Clarington Energy Business Park (CEBP). Given

¹ May 2008 Durham Business Case evaluation (Report 2008-J-13) conducted by Deloitte & Touche LLP determined that it would cost approximately \$16,915,000 a year to operate the facility, assuming a waste throughput of 140,000 tpy. The RFP submission from Covanta identified annual operating costs for the same sized facility at \$14,665,000. According to Durham Region Report 2009-J-18 the Covanta submission falls within the scope of the Durham Business Case.

the level of investment associated with the Project in infrastructure in the CEBP and the potential availability of district heating and cooling, it is likely that new industries may be attracted to the area strengthening both the local tax base in the Municipality of Clarington and in the Region of Durham.

The property taxes (or payment in lieu of taxes) paid as a result of the Project would be an increase in municipal taxes paid to the Municipality of Clarington compared to those generated from the current land use.

It is anticipated that there will be minimal disruption to the use and enjoyment of businesses and agricultural farms within the local area (1 km of the Site) during operations, as no net effects are anticipated from odour, noise, dust, or traffic from the Project during operations. During operations, businesses and agricultural farms within 1 km of the Facility will be able to see the majority of the buildings on the Site, and are expected to experience a medium level visual effect. Some potential visual disturbance is already present as the landscape has already been influenced by human activities. Mitigation measures including Facility design and landscaping can reduce the potential effects.

It is expected that qualified local contractors and businesses could experience increased demand for their products and services from the Facility during operations.

Post-Closure

In regards to decommissioning/post closure, the potential cost of decommissioning and person-years of employment required to complete decommissioning/post closure have not yet been determined. While there would potentially be increased employment required for decommissioning in the long-term this would result in elimination of long-term employment positions, decreases in local expenditures and a likely decrease in contributions to local taxes.

It is anticipated that there will be minimal disruption to the use and enjoyment of businesses and agricultural farms within the local area during post-closure activities. Potential disruptions could be caused by physical effects from noise and visual aesthetics.

Impact Management Measures

No mitigation measures are required for the majority of potential effects, given that they are largely positive.

The potential for a net effect on property values in the local or regional area from the Project is largely related to the potential 'perception' of the Project in the local and regional community. The potential effect on property value based on perception of the Facility can be addressed through the development and implementation of a comprehensive Community Relations Plan.

In regards to the potential effects on the municipal tax base, in addition to the provision of a payment in lieu of taxes, additional mitigation in regards to the provision of municipal services is included in the Host Community Agreement approved by the Municipality of Clarington and the Region of Durham (The Regional Municipality of Durham, 2009). This agreement includes investment by the Region in

additional infrastructure both within the Clarington Energy Business Park and surrounding area to serve both businesses/industry and local residents.

The potential for disruption to the use and enjoyment of businesses and agricultural farms within the local area during construction or operations, by physical effects from noise and visual aesthetics, can be addressed in part by the mitigation measures identified as part of the Acoustic and Visual assessments completed as part of the EA.

400,000 tpy Scenario

Should the Facility be expanded to receive a waste throughput of 400,000 tpy, it is expected that overall there would be positive net effects on the economic environment within the LESA and RESA for the majority of economic criterion and indicators assessed in this Study.

Summary

Overall, the Project is expected to generally have positive net effects on the economic environment within the local and/or regional areas, as defined by the *Economic Assessment - Technical Study Report* for the majority of economic criterion and indicators assessed in this Study. The economic effects of the Project will benefit the local and regional areas through increased employment opportunities, addition of wages, potential growth in various service sectors, and providing a more sustainable economic community base. The Project could also provide some economic benefit to assist in alleviating the effects of the economic downturn in the Region.

There would be minimal potential to disrupt use and enjoyment of local businesses or agricultural farms (located within 1 km of the Site). The only net effects regarding the disruption of use and enjoyment of local businesses within 1 km of the Site would be due to temporary/short-term noise and/or visual effects during construction and due to visual effects during operations both of which would be reduced through proposed mitigation measures.

The approved Host Community Agreement between the Municipality of Clarington and the Region of Durham provides direct economic benefit to the Municipality of Clarington in the form of direct investment in local infrastructure (e.g., investment in supporting infrastructure for the CEBP). (The Regional Municipality of Durham, 2009)

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GLOSSARY AND ABBREVIATIONS

* An asterisk (*) beside a defined term indicates that the term is defined in the Environmental Assessment Act.

Alternatives:	Both alternative methods and alternatives to a proposed undertaking.
Alternative Methods:	<p>Alternative methods of carrying out the proposed undertaking are different ways of doing the same activity.</p> <p>Alternative methods could include consideration of one or more of the following: alternative technologies; alternative methods of applying specific technologies; alternative sites for a proposed undertaking; alternative design methods; and, alternative methods of operating any facilities associated with a proposed undertaking.</p>
Alternatives To:	Alternatives to the proposed undertaking are functionally different ways of approaching and dealing with a problem or opportunity.
Ash:	The non-combustible fraction that remains after combustion of waste.
Bottom Ash:	The non-airborne ash resulting from burning waste in an incinerator. The material, which falls to the bottom of the combustion grate and is removed mechanically in an EFW facility.
Direct Impacts	Immediate economic activities (jobs and income) generated by the Project.
Durham:	The Regional Municipality of Durham or its geographic area, as the context requires.
Durham/York Residual Waste Study:	The Durham/York Residual Waste Study is a joint initiative between the Region of Durham and York Region to work together to find a way to manage solid waste remaining after at-source diversion.
Economic Assessment Study	Estimation of economic activity that results/could result from a specific event, project, policy, etc (economic stimulus).

Emissions Trading:	The creation of surplus emission reductions at certain stacks, vents or similar emissions sources and the use of this surplus to meet or redefine pollution requirements applicable to other emissions sources. This allows one source to increase emissions when another source reduces them, maintaining an overall constant emission level. Facilities that reduce emissions substantially may "bank" their "credits" or sell them to other facilities or industries.
Energy-from-Waste (EFW):	The recovery of energy in the form of heat and/or power from the thermal treatment of waste. Generally applied to incineration, pyrolysis, gasification but can also include the combustion of landfill gas and gas produced from anaerobic digestion of organic materials.
Environment*:	<p>The environment is broadly defined under the Environmental Assessment Act as follows:</p> <ul style="list-style-type: none">(a) Air, land or water;(b) Plant and animal life, including human life;(c) The social, economic and cultural conditions that influence the life of humans or a community;(d) Any building, structure, machine or other device or thing made by humans;(e) Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or,(f) Any part or combination of the foregoing and the interrelationships between any two or more of them.
Environmental Assessment:	Environmental assessment is a study, which assesses the potential environmental effects (positive or negative) of a proposal. Key components of an environmental assessment include consultation with government agencies and the public; consideration and evaluation of alternatives; and, the management of potential environmental effects. Conducting an environmental assessment promotes good environmental planning before decisions are made about proceeding with a proposal.

Environmental Assessment Act:	The Environmental Assessment Act (and amendments and regulations thereto) is a provincial statute that sets out a planning and decision-making process to evaluate the potential environmental effects of a proposed undertaking. Proponents wishing to proceed with an undertaking must document their planning and decision-making process and submit the results from their environmental assessment to the Minister for approval.
Ferrous Metals:	Metals derived from iron or steel; products made from ferrous metals include appliances, furniture, containers, and packaging like steel drums and barrels. Recycled products include processing tin/steel cans, strapping, and metals from appliances into new products.
Fly Ash:	The airborne ash resulting from burning waste in an incinerator removed by air pollution control systems.
GTA:	Greater Toronto Area
Impact Management Measures:	Measures which can lessen potential negative environmental effects or enhance positive environmental effects. These measures could include mitigation, compensation, or community enhancement.
Impact Studies:	Studies that predict negative consequences (if any) of a proposed undertaking. Air, visual, natural environmental, traffic, hydrogeological, Noise, Health Risk, Land Use and Hydrological Impact Studies are required under the Environmental Protection Act.
Indirect Impacts	Economic (jobs and income) changes occurring in other businesses/industries in the community that supply inputs to the Project and Project employees.

Individual Environmental Assessment:	<p>An Individual Environmental Assessment requires the following steps to fully address the requirements of the EAA:</p> <ul style="list-style-type: none">Preparation of the Proposed EA Terms of Reference;Submission of the EA Terms of Reference to the Minister of the Environment for Approval;Completion of the EA Study in accordance with approved EA Terms of Reference, and;Submission of the EA Study to the Minister of the Environment for Approval.
Induced Impacts	<p>Economic (jobs and income) changes occurring in other businesses/industries in the community from spending activities of directly and indirectly employed individuals.</p>
Ministry of the Environment (MOE) Ontario:	<p>The MOE monitors pollution and restoration trends in Ontario and uses that information to develop environmental laws, regulations, standards, policies, programs, and guidelines. The MOE works to provide cleaner air, land, and water for Ontarians.</p>
Mitigation:	<p>Measures taken to reduce adverse impacts on the environment.</p>
Municipal Solid Waste (MSW):	<p>Common garbage or trash generated by industries, businesses, institutions, and homes.</p>
Ontario:	<p>The Province of Ontario, or its geographic area, as the context requires.</p>
Person-year	<p>A full-time position for one year constitutes a person year of employment (also known as a full-time equivalent).</p>
Project:	<p>Encompasses the design, construction (including construction financing) and operation of the EFW Facility, and includes, the EA Study, the supply of municipal waste, and the sale of energy.</p>
Proponent*:	<p>A person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.</p>
Regions:	<p>Durham and York collectively.</p>

Terms of Reference:	A document prepared by the proponent and submitted to the Ministry of the Environment for approval. The terms of reference sets out the framework for the planning and decision-making process to be followed by the proponent during the preparation of an environmental assessment. In other words, it is the proponent's work plan for what is going to be studied. If approved, the environmental assessment must be prepared according to the terms of reference.
Thermal Treatment:	Use of elevated temperatures to treat wastes (e.g., combustion or gasification).
Waste-to-Energy (WTE) Facility/Municipal-Waste Combustor:	Facility where recovered municipal solid waste is converted into a usable form of energy, usually via combustion.
York:	The Regional Municipality of York or its geographic area, as context requires.

List of Abbreviations

CEBP	Clarington Energy Business Park
CSC	Construction Sector Council
EA	Environmental assessment
EA ToR	Environmental Assessment Terms of Reference
EAA	<i>Environmental Assessment Act</i>
GTA	Greater Toronto Area
LESA	Local Economic Study Area
RESA	Regional Economic Study Area
Tpy	Tonnes per year
UOIT	University of Ontario Institute and Technology

REPORT

1.0 INTRODUCTION

Durham and York Regions (the Regions) have partnered to undertake a joint Residual Waste Planning Environmental Assessment (EA) Study. Both municipalities are in need of a solution to manage the residual solid waste that remains after diversion. The Regions are working together to address the social, economic, and environmental concerns through an Environmental Assessment (EA) Study process to examine potential long-term residual waste management alternatives.

1.1 The Environmental Assessment Process

The purpose of the undertaking (i.e. what the outcome of this EA Study is intended to do) as described in the Approved EA Terms of Reference is:

“To process - physically, biologically and/or thermally - the waste that remains after the application of both Regions’ at-source waste diversion programs in order to recover resources - both material and energy - and to minimize the amount of material requiring landfill disposal. In proceeding with this undertaking only those approaches that will meet or exceed all regulatory requirements will be considered.”

The EA Study follows a planning approach where environmental constraints or opportunities are considered in the context of the broadly defined environment under the *Environmental Assessment Act* (EAA) (i.e., the natural environment as well as the social, economic and heritage and other “environments” relevant to the undertaking) and potential effects are understood and addressed before development occurs. In accordance with the Approved EA Terms of Reference and EAA, the EA process evaluates: alternatives considering potential effects on the environment; the availability of mitigation measures that address, in whole or in part, the potential effects; and, the comparison of the advantages and disadvantages of the remaining or “net” effects. The result of this process provides the planning rationale and support for a preferred approach and method to implement the undertaking.

It is understood and contemplated that environmental management measures recommended as part of the EA process and this Technical Study Report will in many cases be refined, updated, modified and/or superseded as a result of subsequent approval processes.

The EA document has been prepared and conducted in accordance with the EAA, and in accordance with the Terms of Reference approved by Ontario’s Minister of the Environment on March 31, 2006. There are currently no federal environmental assessment process triggers identified and, therefore, this project does not require approval under the *Canadian Environmental Assessment Act* (CEAA).

This EA process essentially consists of three parts taking place in stages including:

- the Development and Approval of an EA Terms of Reference,

- the evaluation of “Alternatives to” the undertaking, and;
- the evaluation of “Alternative methods” of implementing the undertaking.

The Environmental Assessment Report to which this Technical Study is appended provides a detailed description of the EA process undertaken as part of the EA Study.

1.2 Purpose of the Report

This Report entitled *Economic Assessment - Technical Study Report* has been prepared to assess the potential economic related impacts associated with the development of a Proposed Thermal Treatment Facility (the Facility) on the Proposed Thermal Treatment Facility Site (the Site), potential mitigation required and net effects. This report will form part of the supporting documentation and materials for the “Description of the Undertaking”, completed as part of the EA Study.

1.3 Overview of Report Contents

This Report describes the existing economic conditions related to the preferred “Alternative method”, Clarington 01 (the Site), followed by a net effects analysis of the Project on the subject aspect(s) of the environment and summary of the required impact management measures. The key components of the report are as follows:

- Section 2.0 An explanation of the study methodology, assumptions and limitations;
- Section 3.0 Description of Existing Conditions, including profiles of economic sectors, industrial land and residential property values, and existing businesses and farms within the Local Economic Study Area (LESA).
- Section 4.0 Results of analysis including potential effects and any required mitigation measures; and,
- Section 5.0 Summary of net effects.

The information contained in this Report has been used to complete the EA.

2.0 STUDY METHODOLOGY

The following sections describe the methodology used during the Economic Assessment. The evaluations, documented in this Technical Study Report, were completed for two (2) design capacity scenarios for the Facility. These are: an initial design capacity of 140,000 tonnes per year (tpy) (140,000 tpy scenario); and a maximum design capacity of 400,000 tpy (400,000 tpy scenario) for the Facility.

2.1 Project Description

The Proposed Thermal Treatment Facility (the Facility) is proposed to be developed on the Clarington 01 Site. The Clarington 01 Site is undeveloped land owned by the Region of Durham, located in Lot 27, Broken Front Concession, on the west side of Osborne Road, north of a CN Rail corridor, south of Hwy 401 in the Municipality of Clarington. There are commercial properties north of the Site. The lands east and west of the Site are undeveloped and are currently used for agricultural purposes. The Courtice Water Pollution Control Plant was built just south of the Site and completed in 2008. The Darlington Nuclear Generating Station is located approximately 1.8 km to the east.

The nearest major intersection is Hwy 401 and Courtice Road, which is approximately 1.5 km from the site. The Site is approximately 12.1 hectares in area and is located in the Clarington Energy Business Park (CEBP). Access to and from the site during construction and operations is expected to be along Courtice Road, South Service Road and Osborne Road.

The Proposed Facility would have an initial design capacity of 140,000 tonnes of waste annually and may be expanded to a maximum design capacity of 400,000 tonnes of waste per year at some point within the 35-year planning period. With the initial design, there will be two completely independent waste processing trains at the Facility. Each train will consist of a feed chute, stoker, integrated furnace/boiler, acid gas scrubber, a fabric filter baghouse and associated ash and residue collection systems. Steam produced in the boilers will drive an electrical power generating system consisting of one turbine-generator set, switchgear and an air cooled condenser, to produce electricity for delivery to the grid, for in-plant use and potentially to provide district heating (and cooling) to the neighbouring Courtice Water Pollution Control Plant and Clarington Energy Business Park.

The overall construction schedule for the Project is 30 to 33 months, from the Notice to Proceed (assumed to be upon EA approval, identified on a preliminary basis as January 2010) to the Facility being mechanically complete, with another 7 months of commissioning prior to the guaranteed Contractual Completion Date of the Facility. The Facility is expected to operate for in the order of 30 years. The Facility will be operated by a staff of approximately 33 full-time personnel who fall into the following major groups or departments; Management and Administration, Operations and Maintenance.

The cost to construct the Facility is estimated as \$236 million (Covanta, 2009) of which up to half or \$118 million is expected to be spent locally/regionally and the gross cost to operate the Facility is estimated as \$14.7 million (Covanta, 2009) the majority of which would be spent locally/regionally. The

operating costs do not account for revenues from electricity, sale of Greenhouse Gas credits, and ferrous and non-ferrous metal recovery. Annual electricity revenues are anticipated to be \$8.59 million. This is assuming a fixed power purchase price of 8 cents per kilowatt hour, and a waste throughput of 140,000 tpy.

In regards to the potential for district heating and cooling, some provisions have been included in the Facility design however, capital and operating costs, and system revenues have not yet been determined.

2.2 Study Areas for Economic Assessment

For the purposes of the Economic Assessment two study areas were used:

- **Regional Economic Study Area (RESA):** The RESA includes all lands within the municipal boundaries of Durham and York Regions. This study area reflects the economic activities and effects within both Regions. See Figure 2-1 for a map of the RESA.
- **Local Economic Study Area (LESA):** The LESA includes all lands within a 1 kilometer radius of the Site. A 1 km radius was used to define the boundary of the LESA because physical effects will be felt most strongly within 1 kilometer from the proposed Site. See Figure 2-2 for a map of the LESA.

2.3 Objectives

The Economic Assessment summarizes the existing economic conditions within the Study Areas, including a description of dominant industries and an overview of employment by industry.

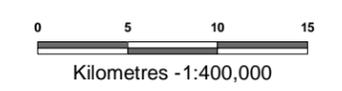
The Economic Assessment assesses the economic effects of the Project during construction, operations, and post-closure using the following economic, financial, and socio-economic measures and indicators:

Economic and Financial Measures	Indicator	Study Area
Employment levels	<ul style="list-style-type: none"> ▪ Direct employment ▪ Indirect employment ▪ Induced employment 	<ul style="list-style-type: none"> ▪ LESA, RESA ▪ LESA, RESA ▪ LESA, RESA
Aggregate wages and salaries	<ul style="list-style-type: none"> ▪ Wages and salaries 	<ul style="list-style-type: none"> ▪ LESA, RESA
Wealth	<ul style="list-style-type: none"> ▪ Property Value 	<ul style="list-style-type: none"> ▪ LESA
Municipal revenues and expenditures	<ul style="list-style-type: none"> ▪ Tax base ▪ Cost of municipal services ▪ Project expenditures 	<ul style="list-style-type: none"> ▪ RESA ▪ RESA ▪ LESA, RESA
Socio-Economic Measures	Indicator	Study Area
Effects on existing businesses	<ul style="list-style-type: none"> ▪ Displacement of businesses and agricultural farms ▪ Disruption to use and enjoyment of businesses and agricultural farms 	<ul style="list-style-type: none"> ▪ LESA ▪ LESA
Business opportunities	<ul style="list-style-type: none"> ▪ Demand for goods and services 	<ul style="list-style-type: none"> ▪ LESA, RESA

Regional Study Area Used for Economic Assessment

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- Road
- Watercourse
- ▭ Regional Economic Study Area
- - - Local Municipal Boundary
- Oak Ridges Moraine
- Waterbody

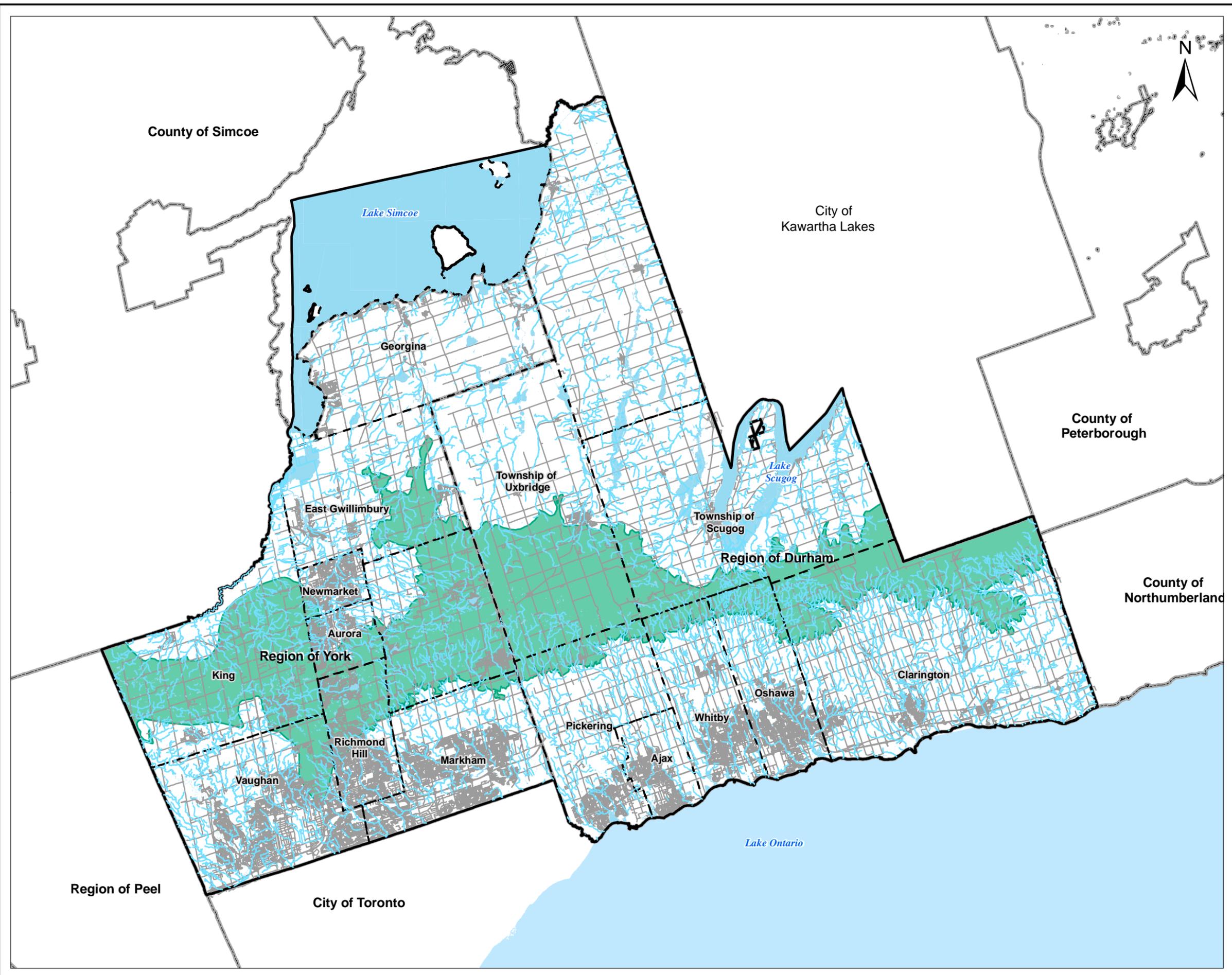


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FIGURE NO.
2-1

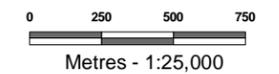
Last Modified: July 23, 2008 By: S.A.M.



Local Study Area Used for Economic Assessment

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-  Collector
-  Expressway / Highway
-  Railway
-  Watercourse
-  Clarington 01 Site
-  Local Economic Study Area



1009497-074



FIGURE NO.

2-2

For each of the measures to be assessed in the Economic Assessment, three durations will be considered in which potential economic effects may occur:

Construction Period

- The time during which the Project would be constructed and commissioned.

Operational Period

- The time during which the Project will be operated.

Post-Closure Period

- The time after the Project would be closed, which includes decommissioning, post closure monitoring and property maintenance.

Economic data generated from this assessment will be used along with information from other assessments conducted as part of this EA, to determine the overall impact of the Project.

2.4 Data Collection

Data required for the economic impact assessment included:

Background Data Collection

- Summary of major employment sectors in the RESA
- Existing property values for industrial space, industrial land and residential homes
- Number and type of existing businesses with the LESA

Field Data Collection

- Inventory of existing businesses within the LESA; including field monitoring, review of aerial maps and photography of the area, reviewing receptor locations from Human Health Risk Assessment (refer to report, or map).

Finance

- Tax assessment changes expected as a result of the Project
- Anticipated cost of additional municipal services required for the Project
- Expenditures associated with the Project during construction and operations

Employment and Wages

- Employment expected at the Facility during construction and operations
- Wages and salaries expected to be paid during construction and operations of the Facility

Economic data for the construction, operations and post-closure periods of the Project was provided by;

- The Durham York Energy from Waste Facility Business Case, prepared for the Region of Durham by Deloitte and Touche LLP; and,
- The Design, Build, Operate and Maintain Proposal submission, submitted by Covanta Energy Corporation.

2.5 Methodology

The Economic Assessment assessed the economic effects of the Project for the Facility during construction, operations, and post-closure using the following methodology for the economic, financial, and socio-economic measures and indicators:

Economic and Financial Measures	Indicator	Methodology
Employment levels	<ul style="list-style-type: none"> ▪ Direct employment ▪ Indirect employment ▪ Induced employment 	<ul style="list-style-type: none"> ▪ Estimated labour force directly hired by Covanta. ▪ Indirect employment during construction period: Use of Statistics Canada Input-Output Model multiplier based on 2.84 person-years of employment resulting from \$1 million in capital expenditures. ▪ Indirect employment during operations period: Use of Statistics Canada Input-Output Model multiplier based on 0.7 indirect jobs created for every one direct job. ▪ Use of Ministry of Agriculture, Food and Rural Affairs multiplier (Ministry of Agricultural, Food and Rural Affairs, 2007), of one induced person-year of employment for every five direct or indirect person-years of employment.
Aggregate wages and salaries	<ul style="list-style-type: none"> ▪ Wages and salaries 	<ul style="list-style-type: none"> ▪ Estimated wages and salaries identified by Covanta, 2009.
Effects on Property Value	<ul style="list-style-type: none"> ▪ Property Value 	<ul style="list-style-type: none"> ▪ Review of Property Value Studies (North America and Europe).
Municipal revenues and expenditures	<ul style="list-style-type: none"> ▪ Tax base ▪ Cost of municipal services ▪ Project expenditures 	<ul style="list-style-type: none"> ▪ Estimated payment in lieu of taxes included in Host Community Agreement. ▪ Estimated use of/demand for municipal services by construction and operational labour force. ▪ Total project expenditures and business case (Covanta 2009, Deloitte and Touche LLP, 2008).
Socio-Economic Measures	Indicator	Methodology
Effects on existing businesses	<ul style="list-style-type: none"> ▪ Displacement of businesses and agricultural farms ▪ Disruption to use and enjoyment of businesses and agricultural farms 	<ul style="list-style-type: none"> ▪ Determination of the number of businesses and agricultural farms that would be displaced. ▪ Review of potential physical effects (noise, traffic, etc) of the Project in the LESA.
Business opportunities	<ul style="list-style-type: none"> • Demand for goods and services 	<ul style="list-style-type: none"> • Estimation of the potential demand for local goods and services based on Covanta proposal (Covanta 2009).

Economic multipliers were used to determine the indirect and induced employment numbers during construction and operations of the Project. Economic multiplier impacts should be interpreted with caution since they can vary with economic patterns and employment levels.

An employment multiplier is designed to provide an estimate on the total employment opportunities attributed to the direct employment created by a project. Information regarding employment during the construction and operational periods for the Project was provided by Covanta (Covanta, 2009).

Indirect employment figures from construction are based on Statistics Canada's Input-Output Model using the Non-Residential Construction cost index where 2.84 jobs were created for every \$1 million in capital investment. Therefore for every \$1 million in capital investment 2.84 indirect jobs are anticipated to be created. This economic multiplier is based on 2005 dollar values. Therefore the construction costs for the Project (\$236 million) were deflated to 2005 dollar values (approximately 80% of construction costs), or \$188.8 million. This economic multiplier accounts for indirect employment within this Region of Ontario adjusted for the purchase of a proportion of goods and services from outside the Region and/or outside Ontario, thus accounting for the proposed use of local services/investment as noted in the Covanta proposal.

Indirect employment figures from operations are based on Statistics Canada's Input-Output Model for the Electric Power Generation, Transmission and Distribution Industry in Ontario, where 0.7 indirect jobs are created for every one direct job. Therefore for every one person-year of direct employment from operations of the Project, 0.7 indirect jobs are anticipated to be created.

It is anticipated that induced jobs will be created as a result of the Project, from the spending activities of the individuals that are directly and indirectly employed during construction of the Project. Induced jobs are anticipated to be located primarily in the RESA. Induced jobs were calculated based on the assumption that 1 induced job is created for every 5 persons directly employed through the purchase of goods and services by those individuals with their wages (Ministry of Agricultural, Food and Rural Affairs, 2007).

3.0 DESCRIPTION OF EXISTING CONDITIONS

Economic development within Durham is heavily based on the manufacturing and energy industries. These industries have been attracted to the area because of its abundant land supply, supportive transportation infrastructure, highly skilled workforce, government supportive and diverse industrial base.

Economic development within York is based on manufacturing and business service industries. These industries are attracted to York based on accessibility, skilled labour force and supporting infrastructure.

3.1 Overview of Economic Base

A summary of employment by industry in Durham and York, as reported by Statistics Canada in 2006 (Statistics Canada, 2006), is presented in Table 3-1. Business services and manufacturing industries account for approximately one-fifth and one-seventh of the total employment in both Regions. Retail trade is also a major employer in Durham and York.

Table 3-1 Labour Force by Industry (Durham and York)

Industries	Durham	%	York	%	Ontario	%
Agricultural and Other Resource-Based Industries	10,880	3.5	6,360	1.3	190,000	2.9
Construction	20,755	6.7	32,680	6.6	384,775	5.9
Manufacturing	40,535	13.1	65,310	13.3	899,670	13.9
Wholesale Trade	16,045	5.2	33,220	6.7	307,465	4.7
Retail Trade	36,605	11.8	56,940	11.5	720,235	11.1
Finance and Real Estate	24,680	8.0	47,730	9.7	442,610	6.8
Health Care and Social Services	27,985	9.1	37,090	7.5	611,740	9.4
Educational Services	20,335	6.6	33,535	6.8	433,485	6.7
Business Services	58,945	19.0	103,950	21.2	1,274,345	19.7
Other Services	52,120	16.9	75,705	15.4	1,209,390	18.7
Total – Experienced Labour Force	308,895	100.0	492,530	100.0	6,473,730	100.0

The unemployment rates in Durham and York Region were approximately 6.3% and 5.4% respectively in 2006 (Statistics Canada, 2006). The unemployment rate in the Oshawa Census Metropolitan Area, which includes Oshawa, Whitby and parts of Clarington, was 8.3 per cent in March 2009, 7.7 percent in April 2009 and 7.9 per cent in May 2009 (Statistics Canada, 2009).

3.2 Labour Force Availability

Construction labour employment information for Ontario is generated through the Construction Sector Council (CSC). CSC provides the information on a regional basis, but not at the municipal level. For example, in CSC's recent construction labour market assessment, *Construction Looking Forward* (CSC, 2009), information for Durham and York Regions is included under the Greater Toronto Area economic region. Specific information about the construction labour market in just Durham and York Regions is not provided. For the purposes of this study, it is assumed that the labour market conditions in Durham and York Regions will be similar to those presented for the GTA in CSC's recent labour market assessment.

The forecasted labour force by trade, within the GTA region for 2010 to 2013 (the anticipated construction period for the Project) are presented in Table 3-2.

Table 3-2 Forecasted Labour Force by Trade

(Source: CSC, 2009)

Trade	Forecasted Labour Force			
	2010	2011	2012	2013
Boilermakers	377	390	406	498
Bricklayers	4462	4501	4509	4595
Carpenters	16142	16166	16084	16257
Concrete finishers	1920	1906	1869	1887
Construction estimators	2086	2089	2065	2124
Construction managers	11143	10962	10602	10751
Construction millwrights and industrial mechanics	437	461	490	635
Contractors and supervisors	11710	11863	11909	12304
Crane operators	731	743	743	779
Drillers and blasters - surface mining, quarrying and construction	93	91	87	98
Electricians, including industrial and power system	12836	13308	13694	14576
Elevator constructors and mechanics	1079	1120	1151	1198
Floor covering installers	2904	2930	2935	2961
Gasfitters	740	752	760	788
Glaziers	1617	1681	1727	1784
Heavy equipment operators (except crane)	3724	3654	3522	3619
Heavy-duty equipment mechanics	341	339	331	346
Industrial instrument technicians and mechanics	63	64	64	73
Insulators	867	888	904	946
Ironworkers and structural metal fabricators and fitters	697	700	695	715
Painters and decorators	9747	9913	9993	10184
Plasterers, drywall installers and finishers, and lathers	7152	7205	7203	7260
Plumbers	7566	7763	7909	8269
Refrigeration and air conditioning mechanics	4925	5157	5341	5549
Residential and commercial installers and servicers	4075	4136	4167	4225
Residential home builders and renovators	9421	9376	9287	9244
Roofers and shinglers	4164	4217	4246	4324
Sheet metal workers	4202	4346	4460	4715
Steamfitters, pipefitters and sprinkler system installers	1165	1204	1252	1523
Tilesetters	2176	2190	2185	2203

Trade	Forecasted Labour Force			
	2010	2011	2012	2013
Trades helpers and labourers	26946	26829	26366	26899
Truck drivers	2015	1998	1951	2044
Welders and related machine operators	1134	1147	1142	1199
Total All Trades	158660	160087	160049	164573

The forecasted unemployment rates by trade, within the GTA region for 2010 to 2013 (the anticipated construction period for the Project) are presented in Table 3-3.

Table 3-3 Forecasted Unemployment Rate (%) by Trade
 (Source: CSC, 2009)

Trade	Forecasted Unemployment Rate (%)			
	2010	2011	2012	2013
Boilermakers	10.6	8.8	7.7	3.0
Bricklayers	8.3	9.4	9.2	7.6
Carpenters	8.5	9.9	9.7	8.1
Concrete finishers	7.6	11.2	11.3	9.0
Construction estimators	5.7	9.1	9.2	6.2
Construction managers	1.8	6.9	7.4	3.8
Construction millwrights and industrial mechanics	10.0	6.6	5.6	3.1
Contractors and supervisors	3.0	5.1	5.1	2.6
Crane operators	7.8	11.6	11.7	8.3
Drillers and blasters - surface mining, quarrying and construction	8.1	15.2	15.4	6.0
Electricians, including industrial and power system	7.3	7.8	7.6	4.9
Elevator constructors and mechanics	6.7	7.7	7.7	6.3
Floor covering installers	8.2	9.4	9.3	8.2
Gasfitters	8.2	9.0	8.7	6.5
Glaziers	6.7	7.6	7.7	6.7
Heavy equipment operators (except crane)	5.8	11.9	12.3	7.9
Heavy-duty equipment mechanics	4.8	11.1	11.6	6.9
Industrial instrument technicians and mechanics	7.8	10.9	10.6	4.9
Insulators	8.9	9.4	9.0	6.8
Ironworkers and structural metal fabricators and fitters	7.5	10.6	10.6	7.8
Painters and decorators	7.4	8.9	8.9	7.6
Plasterers, drywall installers and finishers, and lathers	8.3	9.5	9.4	8.3
Plumbers	6.8	7.6	7.4	5.1
Refrigeration and air conditioning mechanics	6.1	6.3	6.3	5.5
Residential and commercial installers and servicers	8.0	9.1	8.9	7.9
Residential home builders and renovators	10.1	11.1	10.7	9.9
Roofers and shinglers	9.3	10.0	9.8	8.5
Sheet metal workers	7.3	7.9	7.8	5.3
Steamfitters, pipefitters and sprinkler system installers	9.0	7.2	6.1	3.3
Tilesetters	8.1	9.6	9.5	8.3
Trades helpers and labourers	8.1	11.6	11.7	8.9
Truck drivers	6.7	11.8	12.1	7.3
Welders and related machine operators	6.5	10.7	10.9	7.2
Total All Trades	7.1	9.1	9.1	6.8

3.2.1 Manufacturing Sector

The manufacturing sector is diverse within Durham including companies who produce automobiles and automotive parts, structural steel, cardboard, aircraft equipment and furniture.

General Motors was the top employer in Durham in 2006, employing approximately 4% of the labour force. Eight of the top 30 industrial and corporate employers in Durham in 2006 are from the automotive sector. The automotive industry takes advantage of Durham's highly skilled manufacturing-ready workforce and access to local and global automotive markets and suppliers.

Manufacturing in York includes the production of fabricated metals, electronics, transportation equipment, and office furniture. Magna International is the fourth largest original equipment parts supplier in North America. Headquartered in Aurora, within York Region, Magna and its related businesses employ approximately 3% of York's labour force. Several hundred small auto parts suppliers are involved in machinery and equipment, fabricated metals, rubber and plastics and electrical equipment production.

Since 2008, economic conditions in Ontario have led to a reduction in the number of employees working in the automotive sector including at General Motors and Magna International. It is anticipated that General Motors will close its truck plant in Oshawa in 2009, resulting in a loss of 2,600 jobs. Economic losses will be compounded by the fact that 1 in 6 jobs in Ontario are tied directly or indirectly to the automotive industry (DTZ Barnicke, 2008).

3.2.2 Energy Sector

Durham has a number of companies that produce and distribute power; develop new and renewable energy technologies, alternative fuels, manufacturing components and systems; and provide service support to the industry. Ontario Power Generation was the second top employer in Durham in 2006, employing approximately 3% of the labour force. The energy industry benefits from Durham's access to the North American electricity grid and Durham's commitment to workforce development. For example, the University of Ontario Institute and Technology (UOIT) located in Durham, offers degrees in support of energy related business.

3.2.3 Business Sector

Business and financial services employs approximately 20% of Durham and York's labour force. Durham businesses are recognized for their research and development in alternative energy technologies and Internet security. The UOIT partners with businesses to advance industry-driven technology developments.

Fifty nine (59) companies have their corporate head office in York including American Express, Apple, LaFarge Canada Inc, State Farm Insurance, and Adidas Solomon Canada. York has approximately 19% of Greater Toronto Area's Information Communications Technology enterprises including industry leaders such as IBM and Motorola.

Both Durham and York have enterprises in the biomedical and pharmaceutical sector.

3.2.4 Agricultural Sector

In 2001, the average gross farm receipts for Durham equaled \$234 million. There are approximately 1,709 farms in Durham. Durham's agricultural products consist primarily of fruit, dairy, floriculture, livestock, poultry, and corn products. The majority of farmland in Durham in 2001 was in crop production.

Employment in the agricultural industry in York represents approximately 1.3% of the labour force. Based on the 2001 Canadian Census, the average gross farm receipts for York equaled \$178 million. Operations in the Holland Marsh are responsible for producing 95% of Ontario celery, 66% of its onions, 80% of its carrots and 90% of its Asian vegetables. The Holland Marsh has the largest area of organic (muck) soil developed for agriculture in Ontario and one of the most intensive areas of agricultural production in Canada. York has a well developed equine industry. York has the highest estimated number of horses in the province and is renowned for its standard bred and thoroughbred horses.

3.2.5 Tourism

Tourism is an integral part of the RESA's economy. Durham attracts over three million visitors each year, which in 2006 spent over \$259 million on activities and services (Ministry of Tourism, 2007). Durham provides a range of cultural experiences, shopping and recreational opportunities. Durham is home to the Great Blue Heron Charity Casino in Port Perry, which is owned by the Mississauga of Scugog Island First Nation.

In 2006, York attracted nearly three million visitors, who spent approximately \$334 million on activities and services (Ministry of Tourism, 2007). Paramount Canada's Wonderland, located in the City of Vaughan, attracts more than 13 million guests annually.

Within the RESA, Lakes Scugog, Simcoe and Ontario provide year round recreational opportunities and are popular summer destinations for visitors. The Oak Ridges Moraine and many conservation areas offer a range of outdoor activities including biking and hiking. Durham and York have over 70 golf courses and many conservation areas. There are numerous museums in the RESA, one of the most predominant being the McMichael Canadian Art Collection, which is situated on 100 acres of conservation land in Vaughan.

3.3 Property Values

Industrial market

According to DTZ Barnicke, average rental rates for industrial space in communities within Durham and York Region range from \$4.86 to \$6.93 per square foot. Rental rates tend to be higher in York than in Durham. The average sales price for industrial space range from \$66.68 to \$124.90 per square foot. Average sale prices also tend to be higher in York than in Durham.

Land values outside of Toronto are expected to remain steady or increase over the next 6-12 months. Industrial land prices in outlying markets (including Durham and York Region) are lower than for

property found in Toronto. It is expected that as land is absorbed within the GTA, demand will move eastward causing an increase in land values.

The *Durham York Energy from Waste Facility Business Case* estimated EFW land costs at \$80,000 per acre based on recent land transactions in the vicinity of the EFW site.

Residential Housing Market

The recent economic downturn has resulted in a decrease in the number of sales of homes in Durham Region. For example, in March 2009, sales of single family homes in the Region were reported to be 694, a year-over-year decrease of 16% from the 824 sales calculated in March 2008 (Durham Region Association of Realtors, 2009a)

Housing prices also decreased by approximately 4% from 2008 in a year-over-year comparison in Durham Region. For example, the average selling price in March 2009 of \$263,970 has remained steady from February's \$263,899, but is down from the average selling price of \$275,656 in March, 2008 (Durham Region Association of Realtors, 2009a).

Declining mortgage rates, lower housing prices and new federal government incentive programs are expected to encourage home purchasing.

The average selling price for a home in Bowmanville/Courtice in March 2009 was \$239,847 (Durham Region Association of Realtors, 2009b).

In an overview of the Durham Region Housing Market conducted by the Canada Mortgage and Housing Corporation, it was found that sales by municipality were third highest in Clarington with the highest number of sales occurring in Oshawa (CMHC, 2007). In a survey of average resale prices of all homes, Clarington also had the third lowest average housing price of \$255,549 (CMHC, 2007) which may have contributed to an increase in sales in the area.

3.4 Existing Businesses and Farms in the LESA

Existing businesses and farms within the LESA were identified using primary and secondary data sources, and a field survey. Results of the field survey verified there are 11 businesses and three farms currently operating in the LESA (See Figure 3-1 for the location of businesses and farms within the LESA).

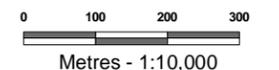
A few of the largest businesses, by property size, include the Courtice Field Transfer Station, operated by Waste Management Inc., and Manheim Oshawa and Copart Auto Auctions which both auction automobiles. The other remaining businesses are dominantly metal fabricating companies. There are two Regional operations within the LESA including the Durham Region Police Services Property Bureau and the Durham Region Water Pollution Control Plant Project Management Site Office. Durham Region's Courtice Water Pollution Control Plant is also located within the LESA.

The three operating farms are located on the East, North West and West side of the Site. They produce field crops such as corn, alfalfa, and soya beans.

Existing Businesses and Farms Within the LESA

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- Business
- Residential
- Recreational Facility
- Courtyce Water Pollution Plant
- Collector
- Expressway / Highway
- Railway
- Watercourse
- Clarington 01 Site
- Local Economic Study Area
- Clarington Business Park
- Waterbody



1009497-078



FIGURE NO.
3-1

Last Modified: July 9, 2008 By: S. Allen

4.0 RESULTS OF ANALYSIS

This section provides an assessment of the potential effects of the Project, assuming a waste throughput of 140,000 tonnes per year (tpy), on the economic environment based on the indicators identified in Section 2.3. The indicators were analyzed using:

- Baseline information collected through secondary (i.e., literature and document review) data;
- The Durham York Energy from Waste Facility Business Case, prepared for the Region of Durham by Deloitte and Touche LLP;
- The Design, Build, Operate and Maintain Proposal submission, submitted by Covanta Energy Corporation; and,
- The results of the assessment of potential Project effects on the economic environment from odour, noise, dust and visual aesthetics.

Evaluations were conducted for the Site, LESA and RESA as appropriate. Potential mitigation measures are identified if required to reduce or eliminate the potential adverse effects and enhance positive effects. The conclusions of the assessment identified any net effects that are likely to result after mitigation.

4.1 Employment Levels

This section discusses the direct, indirect, and induced employment effects in each of the construction, operational and post-closure periods. Employment is a commonly used indicator of economic growth. Economic elements that would be used to evaluate the effects of the Project in this section include number of person-years of employment resulting from the Project during the construction, operations and post-closure periods.

4.1.1 Analysis of Potential Effects

This section discusses direct, indirect, and induced employment for the construction, operational, and post closure periods of the Project. For the purposes of this analysis, direct employment is defined as including all workers dedicated to working directly on the Project, whether employed by Covanta or one of its contractors. This includes design and engineering, management and administration, operations, maintenance, construction workers and other contractors working onsite. Indirect employment includes employment changes expected to occur in other businesses/industries in the community that supply inputs to the Project and Project employees. Induced jobs are created as a result of the spending activities of individuals that are directly and indirectly employed by the Project.

4.1.1.1 Construction Period

Construction of the Facility is expected to begin in 2010 and continue for approximately three years (30 to 33 months), ending in 2013. During construction, the actual number employed and the make-up of those employed would vary over time as the Project goes through the various construction phases. Peak labour demands are anticipated at 50 full-time employees in 2010, 150 in 2011, and 200 in 2012-2013. On average, it is expected that 300 to 400 person-years (equivalent to a full-time position for one year) of direct employment would be generated over the construction period. Local hiring will be maximized during the construction period providing work for existing tradespersons and labourers within the Region. Trades that could be provided locally include pipefitters, electricians, ironworkers, millwrights and carpenters. Labour force and unemployment data from CSC as described in Section 3.1.1 suggest that workers from all of these trades will be available within Durham and York Region during the construction period.

New construction projects in Ontario are documented by CSC and provided to local trade unions and construction associations. The only new construction project for Durham and York Regions identified by CSC is the construction of a nuclear generation plant starting after 2012 (CSC, 2009). It is assumed this reference is to the proposed Ontario Power Generation Darlington Nuclear Power Plant Project, which would see an expansion of the existing Darlington facility. Construction was expected to commence in 2010, and be completed by 2012, however in June 2009 the project was put on hold. It is not anticipated that the Darlington expansion project will come back online during the construction period for the Project. However, should it reconvene it is not expected to require the same construction trades at the same time as the Project, and therefore it is not anticipated that the availability of the local labour force for the Project would be affected.

Working hours will vary depending on the construction activity. It is anticipated that pipefitters and electricians will work an 8 or 9 hour day from Monday through Thursday, followed by a 4 hour shift on Fridays. Ironworkers, millwrights and carpenters will work between 8-10 hours per day Monday through Friday. General labourers will work between 8.5 to 10.5 hours per day Monday through Thursday. Construction activities are anticipated to occur from Monday through Thursday from 7 a.m. to 6 p.m. with occasional shifts on Fridays and Saturdays as needed.

Along with the direct employment associated with onsite construction, the Project is expected to generate or sustain an estimated 534 indirect full-time equivalent workers. As described in Section 2.5, this figure is based on Statistics Canada's Input-Output Model using the Non-Residential Construction cost index where 2.84 jobs were created for every \$1 million in capital investment. This economic multiplier is based on 2005 dollar values. Therefore the construction costs for the Project (\$236 million) were deflated to 2005 dollar values (approximately 80% of construction costs), or \$188.8 million.

The capital investment figures were provided from the Covanta proposal submission. According to Covanta's proposal submission, the types of services required during construction that could be sourced Regionally, include site work (i.e.; excavation, fill and grading, preparing parking areas and roadways), landscaping (i.e.; seeding, planting, grading, installing fences and gates), construction services (i.e., concrete, structural, maintenance, electrical, and refuse services), and equipment

providers (i.e., HVAC and electrical) are required. Indirect jobs are anticipated to be located primarily in the RESA.

It is anticipated that induced jobs will be created as a result of the Project, from the spending activities of the individuals that are direct and indirectly employed during construction of the Project. Induced jobs are anticipated to be located primarily in the RESA. Induced jobs were calculated based on the assumption that 1 induced job is created for every 5 persons directly and indirectly employed through the purchase of goods and services by those individuals with their wages. Therefore during construction between 167 and 187 induced jobs are expected to be generated. Examples of the categories of induced jobs which may be created or sustained in the RESA include financial services, social services, retail, and transportation.

A summary of the potential person-years of local/regional employment (both total and annual) estimated for the construction period of the Project is as follows:

Employment Type	Estimated Total Person-Years Over Construction Period	Estimated Average Annual Person-Years Construction Period
Direct	300 to 400	120 to 160
Indirect	534	214
Induced	167 to 187	67 to 75
Total	1,001 to 1,121	401 to 449

4.1.1.2 Operational Period

During the operational period, the Project would directly employ an estimated 33 full-time equivalents, or 33 person-years annually. The new employment positions could include: management (~4), safety, environmental compliance, operations (~16, i.e., shift supervisors, control room operator, operations crews), maintenance (~8), refurbishment, back up operations, waste transport, and administration (~5) (Covanta, 2009). Local hiring will be maximized during the construction period.

Along with the direct employment associated with operations, the Project is expected to generate or sustain an estimated 23 indirect full-time equivalent workers annually. These could be either newly created positions or current positions that are sustained by new demand for services. As described in Section 2.5, this figure is based on Statistics Canada's Input-Output Model for the Electric Power Generation, Transmission and Distribution Industry in Ontario, where 0.7 indirect jobs are created for every one direct job.

According to the Covanta proposal submission, \$10-14 million a year will be spent on locally/Regionally sourced labor, goods and services. These jobs could include producers of manufactured goods necessary to support the Facility during the operational period, transportation services, landscaping, grounds keeping and janitorial services, uniform and laundry services, certain environmental testing, and hazardous waste hauling. Indirect jobs are anticipated to be located primarily in the RESA.

It is anticipated that induced jobs will be created as a result of the Project, from the spending activities of the individuals that are direct and indirectly employed during operation of the Project. Induced jobs are anticipated to be located primarily in the RESA. Induced jobs were calculated based on the assumption that 1 induced job is created for every 5 persons directly and indirectly employed through

the purchase of goods and services by those individuals with their wages. Direct and indirect employment during operations of the Project in the local/Regional area would generate or sustain approximately 11 person-years of induced employment annually. Examples of the categories of induced jobs which may be created in the RESA include financial services, social services, retail, and transportation.

It is expected that qualified local contractors and businesses could see an increased demand for their products and services from the Project during operations.

A summary of the potential person-years of employment estimated for the operational period of the Project is as follows:

Employment Type	Estimated Average Annual Person-Years During Operations
Direct	33
Indirect	23
Induced	11
Total	67

The unemployment rate in the Oshawa Census Metropolitan Area, which includes Oshawa, Whitby and parts of Clarington, was 8.3 % in March, 7.7 % in April and 7.9 % in May 2009 (Statistics Canada, 2009). The potential person-years of employment associated with the construction and operational periods for the Project would provide employment opportunities for some of this available workforce.

4.1.1.3 Post Closure Period

The post-closure period consists of two main activities that apply to both direct and indirect employment. The first involves decommissioning and deconstruction activities, which may include the sale or recycling of infrastructure to minimize waste and potentially recover cost. The second may include a series of Phase I and Phase II Environmental Site Assessments, Designated Substance Surveys, and environmental matters which may need to be considered. Such activities require the use of professional engineering, scientific, and management consulting firms.

Direct jobs generated by activities related to these post closure activities for the local work force may include heavy equipment owners and operators, skilled trades, general labourers and safety specialists experienced in the waste management sector.

A number of trades would be required for the decommissioning, deconstruction and possible remediation at the Project site. It is currently unknown as to what the decommissioning plan would involve for the Project, however, for the purposes of this assessment, this period is anticipated to take several years to complete, and would require similar activities and but fewer personnel as those involved during the construction period of the Project.

4.1.1.4 Net Effects

Increased direct, indirect and induced employment within the LESA and RESA as a result of the construction, operations and decommissioning of the Project will have a positive impact on the economic environment.

4.2 Wages and Salaries

This section discusses the effects of wages and salaries in each of the construction, operational and post-closure periods. Wages and salaries are a measure of the economic benefit of the Project.

4.2.1.1 Construction Period

During the construction period, it is estimated that the average worker wage would be \$54 (CDN) per hour. These wages are higher than the average hourly wage rates in Ontario for the construction or utilities sectors of \$35.58 and \$25.47 respectively (Statistics Canada, Survey of Employment Payrolls and Hours, 2008). Using an average number throughout the construction period of 50 to 200 full-time employees (it is expected the number of workers would vary throughout this period), working an average of 40 hours per week, this represents a total of approximately \$5.6 to \$22.4 million (CDN) in direct wages and salaries over the 30 to 33 month construction period.

4.2.1.2 Operational Period

Total annual labour costs, including salaries, wages and benefits, from the Project during operations, are expected to be approximately \$5 million (CDN) per year (Covanta, 2009).

Covanta provides their employees with benefits such as on the job training, safety and emergency training, life insurance, employee assistance programs, investment plans, technical and professional development training, and educational reimbursements.

4.2.1.3 Post Closure Period

A number of trades would be required for the decommissioning, deconstruction and possible remediation at the Project site. It is currently unknown as to what the decommissioning plan would involve for the Project, however, for the purposes of this assessment, this period is anticipated to take approximately several years to complete, and would require similar activities and fewer personnel as those involved during the construction period of the Project. Therefore potential total wages and salaries applicable during post-closure would likely be less compared to those from the construction period.

4.2.1.4 Net Effects

Wages and salaries paid as a result of the construction, operations and decommissioning Project will have a positive impact on the economic environment in the LESA and RESA.

4.3 Property Value Effects

Recent European studies (CBRE, 2007; DTZ Piedad Consulting, 2002; NSCAEP, 2001), indicate that Thermal Treatment Facilities have no measurable impact on the value or ability to sell property in areas around such facilities. Some research suggests there may be a potential short-term effect on property value largely as a result of the perceived effect of thermal treatment facilities. Once the perception of risk subsides however, any negative impact on property values dissipates.

Experience in Ontario indicates that in the local area around waste management facilities in-general there is little evidence of potential long-term effects on property values and in many cases property values around landfills for example have escalated over time as urban development encroaches the areas occupied by such facilities.

The Facility has the potential to have either a neutral or positive effect on property value in the immediate vicinity of the Site within the Clarington Energy Business Park, given the investment in infrastructure (road access, district heating and cooling) and depending on the public perception of risk associated with the Facility. Addressing key issues, raised by the public during this Project, and construction and operations of the Facility will help to alleviate the perception of risk associated with the Facility. This can be addressed through the development and implementation of a comprehensive Community Relations Plan. Additional information on the Community Relations Plan are provided in the Social Cultural Assessment completed as part of this EA.

It is anticipated that there will be minimal disruption to the use and enjoyment of businesses and agricultural farms within the local area during construction, operations and post-closure activities. Potential disruptions could be caused by physical effects from noise and visual aesthetics (See Section 4.8 for more information on physical effects).

Industrial Property Values

It is anticipated that businesses will be attracted to the LESA, and especially to the proposed Clarington Energy Business Park (CEBP), so they can take advantage of the potential district heating (and cooling) infrastructure. The provision of improved road infrastructure is also expected to attract businesses along South Service Road and Osborne Road. This may have a positive impact on industrial property values.

Residential and Agricultural Property Values

Three operating agricultural farms are currently located within the LESA. Two of these farms have occupied onsite residences. In regards to current land use designations, none of the land located within the LESA is designated for agricultural and/or residential usage, including the locations of the three farms.

All three farms are located on properties within lands that are designated for industrial usage and are within the boundary of the proposed CEBP. It is assumed that the farming activities will continue until the development of the CEBP or other industrial activities.

Based on the findings in the Site Specific *Human Health and Ecological Risk Assessment Technical Study Report*, deposition of particulate matter on properties within the LESA will be minimal. No adverse effect is anticipated on crop value during operations of the Facility from deposition of particulate matter.

4.3.1.1 Net Effects

The Facility has the potential to have either a neutral or positive effect on property value in the immediate vicinity of the Site within the Clarington Energy Business Park given the investment in infrastructure (road access, district heating and cooling) and depending on the public perception of risk associated with the Facility.

4.4 Municipal Taxes

The Project is likely to contribute to the municipal tax base for the Municipality of Clarington, and potentially the Region of Durham. The actual tax amount (or payment in lieu of taxes) to the Municipality of Clarington related to the Project, would depend on the results of the property assessment of the Project infrastructure upon completion of construction. According to the Host Community Agreement between the Region of Durham and the Municipality of Clarington the payment in lieu of taxes will be approximately \$650,000 per year (The Regional Municipality of Durham, 2009). The municipal taxes will be a net gain for the Municipality of Clarington.

In addition to the provision of a payment in lieu of taxes, additional mitigation in regards to the provision of municipal services is included in the Host Community Agreement approved by the Municipality of Clarington and the Region of Durham. This agreement includes investment by the Region in additional infrastructure both within the CEBP and surrounding area to serve both businesses/industry and local residents. (The Regional Municipality of Durham, 2009)

The Project has provisions for the development of infrastructure for district heating and cooling. The availability of district heating and cooling is expected to be an incentive for businesses looking to locate within the proposed CEBP. Development of the CEBP will increase the tax base for the Municipality of Clarington and Durham Region.

In regards to impacts to the tax base related to the demand for local or regional services during construction, the average annual person-years (401 to 449) of local/regional employment is most likely to be filled by local/regional residents and potential new residents in Durham Region and is not expected to result in any increased demands on local or regional services.

In regards to impacts to the tax base related to the demand for local or regional services during operations, the average annual person-years (67) of local/regional employment is most likely to be filled by a combination of existing local/regional residents and potential new residents in Durham Region and is not expected to result in any significant increase in demands on local or regional services.

Some investment is potentially required from Durham Region during the construction and operations periods to improve the local road network. See Traffic Assessment completed as part of this EA for more information.

The net cost of waste management services incurred by the Regions of Durham and York are passed onto the municipal taxpayer. Expenditures during operations of the Project are anticipated to be \$14.67

million per year², excluding revenues from electricity, sale of Greenhouse Gas credits, and ferrous and non-ferrous metal recovery. Annual electricity revenues are anticipated to be \$8.59 million. This is assuming a fixed power purchase price of 8 cents per kilowatt hour, and a waste throughput of 140,000 tpy. Revenue opportunities may also be available through the sale of carbon credits on carbon markets. If revenues from the sale of electricity, Greenhouse Gas credits, and ferrous and non-ferrous metals are included in the operating costs, it is anticipated that operating costs for the Project will be less than sending the waste to a landfill in Ontario (Deloitte and Touche LLP, 2008).

4.4.1.1 Net Effects

The property taxes (or payment in lieu of taxes) paid as a result of the Project would be an increase in municipal taxes paid to the Municipality of Clarington compared to those generated from the current land use. No increased demands for municipal services are anticipated for either the Municipality of Clarington or Durham Region.

4.5 Project Expenditures

4.5.1.1 Construction Period

Expenditures during the construction period of the Project will result in a substantial contribution to the regional and provincial economy. Total construction cost is anticipated to be \$235,759,000³. It is anticipated that up to half of the total construction cost of the Facility, or up to \$118 million, will be spent on locally/Regionally sourced labor, goods and services.

4.5.1.2 Operational Period

As stated in Section 4.4, expenditures during operations of the Project are anticipated to be up to \$14.67 million per year, excluding revenues from electricity and ferrous and non-ferrous metal recovery. Operating expenditures will be spent on employee wages, maintenance, fuel, utilities, disposal costs, insurance, etc.

Future revenues for Durham Region are anticipated from the potential district heating and cooling within the proposed Clarington Energy Business Park. Annual electricity revenues are anticipated to be in the order of \$8.59 million, assuming a fixed power purchase price of 8 cents per kilowatt hour, and a waste throughput of 140,000 tpy. Revenue opportunities may also be available through the sale of carbon credits on carbon markets.

² May 2008 Durham Business Case evaluation (Report 2008-J-13) conducted by Deloitte & Touche LLP determined that it would cost approximately \$16,915,000 a year to operate the facility, assuming a waste throughput of 140,000 tpy. The RFP submission from Covanta identified annual operating costs for the same sized facility at \$14,665,000. According to Durham Region Report 2009-J-18 the Covanta submission falls within the scope of the Durham Business Case

³ May 2008 Durham Business Case evaluation (Report 2008-J-13) conducted by Deloitte & Touche LLP determined that it would cost approximately \$197,618,000 to build the Project, assuming a waste throughput of 140,000 tpy. The RFP submission from Covanta identified construction costs for the same sized facility at \$235,759,000. According to Durham Region Report 2009-J-18 the Covanta submission falls within the scope of the Durham Business Case.

4.5.1.3 Post Closure Period

Expenditures are anticipated to be less than those generated from the construction period.

4.5.1.4 Net Effects

The economic effects of Project expenditures will benefit the RESA through increased employment, growth in various service sectors, providing a more sustainable economic community base.

4.6 Public Cost of Municipal Services

Municipal servicing costs related to development of commercial/industrial projects are not related to the building of the Facility but rather related to the requirement to provide municipal services for the increased population growth in the community from the employees working on the project. The most significant change in direct employment for this Project is associated with the construction period when approximately 300 to 400 person-years (equivalent to a full-time position for one year) of direct employment would be generated over the construction period.

Some road improvements may be required to South Service Road and Osborne Road as a result of the Project (See *Traffic Assessment - Technical Study Report* for more information).

During the construction period, it is not anticipated that there would be any significant change in population in the RESA as only 50 to 200 direct employees would be working on the Site at any one time as compared to the Durham Region population of approximately 561,258 (Statistics Canada, 2006) which is growing by approximately 10,000 new residents per year and which is expected to reach over 660,000 by 2011 (Ministry of Public Infrastructure and Renewal, 2006). The Municipality of Clarington has a current population of 77,820 and is growing at approximately 2.34% per year (Statistics Canada, 2006). It is likely that Facility employees would come from many communities across the Region. As a result, it is unlikely that additional fire, police and emergency services or additional schools would be required. Therefore there should be no additional costs to the public in relation to these municipal services.

The Project will be the first development within the proposed Clarington Energy Business Park. Water and sewer services have already been extended to where the Facility is located, which will meet the needs of the Facility.

4.7 Displacement of Businesses and Agricultural Farms

Displacement of businesses and agricultural farms located within the Site and LESA refers to the physical removal of a business or farm from its current location due to the alignment of roadways and development of the Facility.

No businesses are located within the Site boundary. None of the 11 businesses and three farms currently operating in the LESA will be displaced as a result of the Project either due to the development of the Facility or due to potential road work improvements required along the haul route.

The Site is designated as Employment Area (Durham Region Official Plan), and Business Park (Municipality of Clarington Official Plan). Industrial activities are permitted under both uses.

4.8 Disruption to Use and Enjoyment of Businesses and Agricultural Farms

The following sections analyze the disruption to use and enjoyment of businesses and agricultural farms within the Site and LESA during the construction, operations, and post-closure of the Project. Agricultural farms were identified as properties currently used for agricultural purposes with or without residences. All residences were regarded as residential receptors regardless of whether they were located on land zoned residential or agricultural and the potential effects on such residential receptors were assessed in the *Social/Cultural Assessment Technical Study Report*.

Potential disruption to use and enjoyment of businesses and agricultural farms may occur within the LESA. Potential disruptions could be caused by physical effects from odour, noise, dust, traffic, and visual aesthetics. These effects have been analyzed in other technical studies as part of the EA, and are outlined below in relation to their effect on the economic environment during the construction, operation and post-closure periods.

4.8.1.1 Construction Period

The construction period will include Site preparation activities, clearing of land, delivery of equipment, machinery and material to the Site, and construction of the Facility. The potential physical effects associated with the Project during the construction period are described below:

Odour

Minimal to no odour is expected to affect adjacent businesses or agricultural farms within the LESA during construction. No potential physical effects are anticipated on businesses during construction from odour.

Noise

Two main activities may create elevated sound levels that may have some effect after mitigation measure are in place: pile driving and construction vehicle traffic. These activities are a concern during worse-case scenarios but are temporary and of short duration. Both activities would cease upon completion of the construction of the Project.

The majority of construction activities are expected to occur during the daytime when receptors are less sensitive to noise.

Dust

Dust emissions from construction activities are associated with land clearing, ground excavation, cut and fill operations and equipment on the site. Dust emissions are expected to be temporary and short term. No potential physical effects are anticipated on existing businesses and agricultural farms during construction from dust.

Traffic

It is proposed that traffic will travel to the Site via the Hwy 401/Courtice Road interchange, then travel along South Service Road, and on Osborne Road. There are three businesses located along this route; one at the south west corner of South Service Road and Osborne Road, and two east of the proposed Site entrance. Traffic levels will be highest during the third year of construction (2013). At the peak hour in 2012-2013, there will be 120 cars and 1 truck traveling to and from the Site. The greatest effect on traffic is expected to take place during the weekdays. The road network adjacent to the Site does not require signal improvements to accommodate construction traffic. No potential physical effects are anticipated on existing businesses and agricultural farms during construction from traffic.

Visual Aesthetics

Visual effects associated with construction would include Site clearing, grubbing, and associated ground disturbance, which may be considered unsightly. Large construction equipment could be visible from different vantages around the Site, potentially resulting in visual disturbances. Construction activities would take place in stages. The early stages of construction would have the greatest potential for visual effects however, this intensive stage of construction is not expected to have a long duration.

Considering the businesses and agricultural practices within the LESA and considering the potential effects, mitigation measures and net effects for physical effects as documented in the supporting Technical Study Reports and as outlined above, the Project is anticipated to have minimal overall net effects in regards to the "Potential to Disrupt the use and enjoyment of businesses and agricultural farms" during construction. Only short-term effects related to noise and visual aesthetics are anticipated, and both would be reduced based on proposed impact management measures.

4.8.1.2 Operational Period

Businesses and agricultural farms located in the LESA may experience potential physical effects as a result of the normal day-to-day operations of the Project. The potential physical effects associated with the Project during the operational period are described below:

Odour

Based on the proposed mitigation measures for odour control, there is not expected to be adverse off-property odour effects due to operations. No potential physical effects are anticipated on businesses during operations from odour.

Noise

No potential effect of noise to adjacent businesses or agricultural areas is expected as, the predicted noise levels at all nearby residential receptors within the same area are less than the applicable criteria for the operational scenario assessed for the Facility.

Dust

Dust emissions from Operations would be managed via Facility design and operational controls. All access roads and parking areas at the Site will be paved to reduce the potential for dust emissions from vehicular traffic (either passenger cars or truck traffic). All materials that could result in dust emissions will be managed in enclosed environments with appropriate air handling equipment to mitigate dust emissions. No potential physical effects are anticipated on existing businesses and agricultural farms during operations from dust.

Traffic

It is proposed that traffic will travel to the Site via the Hwy 401/Courtice Road interchange, then travel along South Service Road, and on Osborne Road. There are three businesses located along this route; one at the south west corner of South Service Road and Osborne Road, and two east of the proposed Site entrance. Traffic levels would be based on the size of the operating workforce, currently anticipated to be 33 people. Traffic will also be generated from trucking activities. With a waste throughput of 140,000 tpy it is estimated that the worse-case scenario (peak hour) for traffic will be 22 cars and 34 trucks traveling to and from the Site during the same hour. The greatest effect on traffic is expected to take place during the weekdays. The road network adjacent to the Site does not require signal improvements to accommodate operations traffic. Given the potential peak-hour traffic accessing the Facility, no potential physical effects are anticipated on existing businesses and agricultural farms during operations from traffic.

Visual Aesthetics

The stack and upper portion of the process unit of the Facility would be visible within the LESA. During operation businesses and agricultural farms will be able to view the majority of the buildings on the Site, and are expected to experience a medium level of visual magnitude and sensitivity. Only the tallest structures, specifically the stack, would be visible within the broader RESA however, the visibility of the stack is affected by distance and the presence of vertical obstructions. Other industrial facility structures are as visible, if not more visible, than the Facility. As described in the Host Community Agreement, Durham will incorporate a cash allowance of up to nine million dollars for the provision of architectural treatments and upgrades to the Facility.

Considering the businesses and agricultural practices within the LESA and considering the potential effects, mitigation measures and net effects for physical effects as documented in the supporting Technical Studies and as outlined above, the Project is anticipated to have minimal overall net effects in regards to the "Potential to Disrupt the use and enjoyment of businesses and agricultural farms" during operations. The only physical effect that is anticipated is related to visual aesthetics, which will be reduced based on proposed impact management measures related to Facility design and landscaping.

4.8.1.3 Post Closure Period

Businesses located within the LESA may be affected by decommissioning activities associated with the post-closure period of the Project. The potential physical effects associated with the Project during the post closure period are described below:

Noise

Noise effects from decommissioning of the Facility are expected to be no greater than during construction. Activities are a concern during worse-case scenarios but are temporary and of short duration. The majority of decommissioning activities are expected to occur during the daytime when receptors are less sensitive to noise. Due to the commercial and industrial nature of the area adjacent to the Site, noise effects would generally be considered minimal.

Dust

De-commissioning would entail removal of process units and related facilities and re-vegetation of the area. Dust effects are expected to be no greater than during construction. No potential physical effects are anticipated on businesses during post closure from dust.

Traffic

Traffic volumes during this period would be less to those experienced during the construction period but more than during operations. Increased traffic volume from decommissioning would be temporary in nature and have a minimum effect within the LESA. Activities would include delivery and movement of equipment, machinery around the work site, and the removal of debris and materials. No potential physical effects are anticipated on existing businesses and agricultural farms during post-closure activities from traffic.

Visual Aesthetics

Visual effects associated with post-closure are anticipated to be minimal. Demolition and removal of structures at the Facility would likely occur first and could be the most probable phase for potential visual effects during post-closure. Due to the commercial and industrial nature of the area adjacent to the Site, the effect on the visual landscape would generally be considered minimal.

4.8.1.4 Net Effects

Considering the businesses and agricultural practices within the LESA and considering the potential effects, mitigation measures and net effects for physical effects as documented in the supporting Technical Study Reports and as outlined above, the Project is anticipated to have minimal overall net effects in regards to the "Potential to Disrupt the use and enjoyment of businesses and agricultural farms" during decommissioning/post closure.

4.9 Business Opportunities

As a result of the Project, there is the potential for new business opportunities, or growth of existing businesses, including related industries and services. Existing businesses within the community of Courtice could benefit from the demands of the Project workforce, both during construction and operations, due to its close proximity to the Project.

Labour force and unemployment data from CSC as described in Section 3.1.1 suggest that workers from local trades will be available within Durham and York Region during the construction period. It is expected that qualified local contractors and businesses could see an increase demand for their products and services from the Project during both construction and operations.

The Project has provisions for the development of infrastructure for district heating and cooling. The availability of district heating and cooling is expected to be an incentive for businesses looking to locate within the proposed Clarington Energy Business Park.

Increased infrastructure from district heating and cooling, and roadway improvements within the LESA could make the area more attractive to the development of new industry, and provide business opportunities to the construction and business service sectors in the RESA.

5.0 400,000 TPY OPERATING SCENARIO

This section summarizes the assessment of economic effects arising from the maximum design scenario of 400,000 tpy (400,000 tpy scenario). Generally, the methodology used to undertake the assessment was the same as was used in the initial design capacity of 140,000 tpy, although in many cases the potential effects cannot be quantified at this time.

Should the Facility be expanded to receive a waste throughput of 400,000 tpy, it is expected that overall there would be positive net effects on the economic environment within the LESA and RESA for the majority of economic criterion and indicators assessed in this Study.

It is anticipated that additional direct employment opportunities would be provided, beyond those identified in Section 4, as a result of expansion of the Facility. The increase in direct employment would have a positive impact on indirect and induced employment numbers. Additional employment opportunities would provide a positive effect on wages and salaries within the LESA and RESA. At this time it is not possible to quantify the potential direct, indirect and induced employment as the level of capital investment and labour required for the expansion has not yet been determined.

Potential effects on property values associated with the expansion of an existing Facility are expected to be minimal as the community would have first-hand experience that the Facility is operating effectively. Given that the potential expansion to 400,000 tpy could occur at some point during the 35-year planning period, it is anticipated that the potential for property value effects associated with 'perception' of the Facility would be minimized. It is anticipated that there should be minimal to no effect on property values associated with the potential Facility expansion.

The value of property taxes (or payment in lieu of taxes) paid to the Municipality of Clarington as a result of the Project under a 400,000 tpy operating scenario has yet to be determined, but would likely be the same as or greater than that paid under the 140,000 tpy scenario. In regards to impacts to the tax base related to the demand for local or regional services, the employment positions created during construction of the Facility expansion and any additional operating staff, are most likely to be filled by a combination of existing local/regional residents and potential new residents in Durham Region and is not expected to result in any significant increase in demands on local or regional services.

It is anticipated that there will be minimal disruption to the use and enjoyment of businesses and agricultural farms within the LESA during construction and operations of the expanded Facility. Potential disruptions during construction would be caused by physical effects from noise and visual aesthetics, however they are expected to be temporary and short-term in duration. During operations, the primary effect would be in regards to visual aesthetics as the buildings and stacks of the expanded Facility will be visible to businesses in the LESA. These receptors will be able to view the majority of the buildings on the Site, and are expected to experience a medium level visual effect. Some potential visual disturbance is already present as the landscape has already been influenced by human activities. Visual effects can be reduced through Facility design and landscaping.

The location of the Facility will be within the same Site as under the 140,000 tpy scenario, therefore, none of the 11 businesses and three farms currently operating in the LESA would be displaced as a result of the expanded Facility.

It is expected that qualified local contractors and businesses would see an increase demand for their products and services during construction of the expanded Facility.

6.0 IMPACT MANAGEMENT

Impact management measures are measures that can be applied to lessen potential negative environmental effects or enhance positive environmental effects. These measures can include prevention, mitigation measures, compensation, or community enhancement initiatives.

In regards to this economic assessment, a series of impact management measures have been outlined in the other supporting Technical Report Studies to minimize physical effects and their potential to affect the physical and social environment. The following sections provide a brief summary of the impact management measures from the supporting Technical Report Studies and other supporting documents that are relevant to this economic assessment.

6.1 Summary of Measures in Supporting Technical Studies

A brief synopsis of the impact management measures that are closely related to the effects on the economic environment, identified in the Supporting Technical Studies is provided in Table 6.1.

Table 6-1 Impact Management Measures

Issue	Summary of Impact Management Measures	Supporting Technical Study Report
Noise	<p>Construction/decommissioning: monitoring and protection plan to address potential noise and vibration impacts associated with the Project</p> <p>Operational: potential mitigation measures or design modifications to ensure that noise criteria at all offsite receptors are met. Noise reductions may be achieved with equipment-specific controls, setback limitations or property-line barriers.</p>	Acoustic Assessment
Traffic	<p>Construction: road reconstruction/pavement improvements may be required for the section of South Service Road between the interchange and Osborne Road, as well as the section of Osborne Road between South Service Road and the future Site access.</p> <p>Operational: road reconstruction/pavement improvements may be required for the section of South Service Road between the interchange and Osborne Road, as well as the section of Osborne Road between South Service Road and the future Site access. Upon full build out of the Clarington Energy Business Park some improvements (ex: traffic signals, turning movements, widening of Courtice Road) may be required.</p>	Traffic Assessment
Dust	<p>Construction: various measures including the use of construction exits, temporary and permanent grassing, dust control measures, staging of work and emission controls for construction equipment.</p> <p>Operational: various controls and strategies to control fugitive emissions from the Facility including the use of fully enclosed trucks to haul materials, loading and unloading materials in enclosed areas, stabilization of fly ash, residue loading and unloading systems designed to be dust free, and draw of combustion air from above the storage pit, which will maintain a negative pressure in the tipping building and help prevent the escape of dust and odour.</p>	Air Quality Assessment

Issue	Summary of Impact Management Measures	Supporting Technical Study Report
Odour	<p>Construction: no mitigation necessary until residual waste is received upon which time the operational measures to control odour emissions would be used.</p> <p>Operational: various controls and strategies to control odour emissions including the use of fully enclosed trucks to haul materials, loading and unloading materials in enclosed areas, and draw of combustion air from above the storage pit, which will maintain a negative pressure in the tipping building and help prevent the escape of dust and odour.</p>	Air Quality Assessment
Visual	<p>Construction/Decommissioning: Timely removal of debris would lessen the effect associated with these phases.</p> <p>Operational: No mitigation is possible to reduce the visual effects of the Facility on adjacent roadways to the activities and would result in a change to the existing local (1 km) landscape for the duration of the operational period for the Project. Wooded areas and hedgerows would also act to obstruct views of the Facility from various vantages. To reduce the impact of the overall Facility, the use of neutral external colours could also reduce the visual distraction that could result from the presence of the structures.</p> <p>As described in the approved Host Community Agreement, Durham will incorporate a cash allowance of up to nine million dollars for the provision of architectural treatments and upgrades to the Facility.</p>	Visual Assessment

6.2 Summary of Measures in Other Documentation

Additional impact management measures have been identified in other documentation relevant to the Project including the Proposal submitted by Covanta Energy who was selected as the preferred Vendor and the approved Host Community Agreement between Durham Region and the Municipality of Clarington. A brief summary of the measures outlined in each of these documents is provided below.

6.2.1 Covanta Proposal

Impact management measures noted in the Covanta Proposal that are closely related to the effects on the economic environment include:

- Use of construction methods and means to minimize the impact of fugitive dust, odour, noise, traffic emissions during construction;
- Monitoring of contractors' conformance with standards and practices for compliance with applicable health and safety regulations, minimizing air pollution, controlling water pollution; controlling noise and providing hearing safety for workers;
- Development and implementation of a Community Relations Plan (CRP) through which Durham, York, and Covanta staff would relate to the local community, including advance notification to local authorities and residents near the Facility of any unusual noises or activities (e.g., steam blows, pile driving) or other events that may be of concern to the local community. The plan will also establish

contacts and procedures for providing accurate and timely information to the community in the event of an unforeseen incident that may cause concern or impact upon the community.

- Development and implementation of a community complaints system for construction and operations; and,
- Design and operational methods to minimize the impact of fugitive dust, odour, noise, traffic, and debris emissions during operation.

6.2.2 Host Community Agreement

In regards to the potential effects on the municipal tax base, in addition to the provision of a payment in lieu of taxes, additional mitigation in regards to the provision of municipal services is included in the Host Community Agreement approved by the Municipality of Clarington and the Region of Durham. This agreement includes investment by the Region in additional infrastructure both within the Clarington Energy Business Park and surrounding area to serve both businesses/industry and local residents. (The Regional Municipality of Durham, 2009).

7.0 SUMMARY AND CONCLUSION

A summary of the economic effects relating to the Project follows.

Construction

Construction of the Facility is expected to begin in 2010 and continue for approximately three years (30 to 33 months), ending in 2013. During construction, the actual number of workers employed and the make-up of those employed would vary over time as the Facility goes through the various construction phases. Peak labour demands are anticipated at 50 full-time employees in 2010, 150 in 2011, and 200 in 2012-2013. On average, it is expected that 300 to 400 person-years (equivalent to a full-time position for one year) of direct employment would be generated over the construction period. Local hiring will be maximized during the construction period providing work for existing tradespersons and labourers within the Region. Trades that could be provided locally include pipefitters, electricians, ironworkers, millwrights and carpenters.

It is anticipated that up to half of the total construction cost of the Facility of \$236 million, or up to \$118 million, would be spent on locally/Regionally sourced labor, goods and services (Covanta, 2009).

Along with the direct employment associated with onsite construction, capital investment in the Project is expected to generate or sustain an estimated 534 indirect person-years of employment.

During the construction period approximately 167 to 187 person-years of induced employment is expected to be generated or sustained through the purchase of goods and services by the direct and indirect labour force involved in the Project. Examples of the categories of induced jobs which may be created in the Regional Economic Study Area include financial services, social services, retail, and transportation.

A summary of the potential person-years of local/regional employment (both total and annual) estimated for the construction period of the Project is as follows:

Employment Type	Estimated Total Person-Years Over Construction Period	Estimated Average Annual Person-Years Construction Period
Direct	300 to 400	120 to 160
Indirect	534	214
Induced	167 to 187	67 to 75
Total	1,001 to 1,121	401 to 449

During the construction period, it is estimated that the average worker wage would be \$54 (CDN) per hour. These wages are higher than the average hourly wage rates in Ontario for the construction or utilities sectors of \$35.58 and \$25.47 respectively (Statistics Canada, Survey of Employment Payrolls and Hours, 2008). Using an average number throughout the construction period of 50 to 200 full-time employees (it is expected the number of workers would vary throughout this period), working an average of 40 hours per week, this represents a total of approximately \$5.6 to \$22.4 million (CDN) in direct wages and salaries over the 30 to 33 month construction period.

In regards to impacts to the tax base related to the demand for local or regional services, the average annual person-years (401 to 449) of local/regional employment during construction is most likely to be

filled by existing local/regional residents and potential new residents in Durham Region and is not expected to result in any increased demands on local or regional services.

No businesses are located within the Site boundary and thus no businesses will be displaced during construction. None of the 11 businesses and three farms currently operating in the Local Economic Study Area will be displaced as a result of the Facility.

It is anticipated that there will be minimal disruption to the use and enjoyment of the businesses and agricultural farms within the local area during construction. Potential disruptions would be caused by physical effects from noise and visual aesthetics, however they are expected to be temporary and short-term in duration.

It is expected that qualified local contractors and businesses would experience an increase in demand for their products and services from the Project during construction.

Operations

During the operational period, the Project would directly employ an estimated 33 full-time equivalents or 33 person-years annually. The new employment positions could include: management (~4), safety, environmental compliance, operations (~16, i.e., shift supervisors, control room operator, operations crews), maintenance (~8), refurbishment, back up operations, waste transport, and administration (~5) (Covanta, 2009). Along with the direct employment associated with operations, the Project is expected to generate or sustain an estimated 23 indirect full-time equivalent workers annually. These could be either newly created positions or current positions that are sustained by new demand for services. According to the Covanta proposal submission, \$10-14 million a year will be spent on locally/Regionally sourced labor, goods and services during operations. Direct and indirect employment during operations of the Project in the local/Regional area would generate or sustain approximately 11 person-years of induced employment annually. It is expected that qualified local contractors and businesses could see an increased demand for their products and services from the Project during operations.

A summary of the potential person-years of employment estimated for the operational period of the Project is as follows:

Employment Type	Estimated Average Annual Person-Years During Operations
Direct	33
Indirect	23
Induced	11
Total	67

Total annual labour costs, including salaries, wages and benefits, from the Project during operations, are expected to be approximately \$5 million (CDN) per year (Covanta, 2009).

In regards to the potential effect of the Project on the Regional tax base associated with the cost of the Facility that could be passed onto Regional taxpayers, expenditures during operations of the Facility are anticipated to be \$14.67 million per year⁴, excluding revenues from electricity, sale of Greenhouse

⁴ May 2008 Durham Business Case evaluation (Report 2008-J-13) conducted by Deloitte & Touche LLP determined that it would cost approximately \$16,915,000 a year to operate the facility, assuming a waste throughput of 140,000 tpy. The RFP submission from Covanta

Gas credits, and ferrous and non-ferrous metal recovery. Annual electricity revenues are anticipated to be \$8.59 million. This is assuming a fixed power purchase price of 8 cents per kilowatt hour, and a waste throughput of 140,000 tpy. Revenue opportunities may also be available through the sale of carbon credits on carbon markets. If revenues from the sale of electricity, Greenhouse Gas credits, and ferrous and non-ferrous metals are included in the operating costs, it is anticipated that operating costs for the Project will be less than sending the waste to a landfill in Ontario (Deloitte and Touche LLP, 2008).

In regards to potential effects on property values, recent European experiences indicate that Thermal Treatment Facilities appear to have minimal to no measurable impacts on the value or ability to sell property in areas around such facilities. There are indications that in the local area around Thermal Treatment Facilities there may be a potential short-term effect on property value largely as a result of the perceived effect of waste facilities, which return to normal once it is clear that there are no long-term physical effects. The Project has the potential to have either a neutral or positive effect on property value in the immediate vicinity of the Site within the Clarington Energy Business Park, given the investment in infrastructure (road access, district heating and cooling) and depending on the public perception of risk associated with the Facility. Provisions for district heating and cooling have been considered in the design of the Facility and estimates generated in the *Energy and Life Cycle Assessment Technical Study Report* indicate that the Project could provide for a portion of the heating and cooling requirements for the full build-out of the Clarington Energy Business Park (CEBP). Given the level of investment associated with the Project in infrastructure in the CEBP and the potential availability of district heating and cooling, it is likely that new industries may be attracted to the area strengthening both the local tax base in the Municipality of Clarington and in the Region of Durham.

The property taxes (or payment in lieu of taxes) that would be paid as a result of the Project would be an increase in municipal taxes for the Municipality of Clarington compared to the taxes related to the current land use. In regards to impacts to the tax base related to the demand for local or regional services, the average annual person-years (67) of local/regional employment during operations is most likely to be filled by a combination of existing local/regional residents and potential new residents in Durham Region and is not expected to result in any significant increase in demands on local or regional services.

It is anticipated that there will be minimal disruption to the use and enjoyment of businesses and agricultural farms within the local area (1 km of the Site) during operations, as no net effects are anticipated from odour, noise, dust, or traffic from the Project during operations. During operation businesses and agricultural farms within 1 km of the Facility will be able to see the majority of the buildings on the Site, and are expected to experience a medium level visual effect. Some potential visual disturbance is already present as the landscape has already been influenced by human activities. Mitigation measures including Facility design and landscaping can reduce the potential effects. It is expected that qualified local contractors and businesses could experience increased demand for their products and services from the Facility during operations.

identified annual operating costs for the same sized facility at \$14,665,000. According to Durham Region Report 2009-J-18 the Covanta submission falls within the scope of the Durham Business Case.

Post-Closure

In regards to decommissioning/post closure, the potential cost of decommissioning and person-years of employment required to complete decommissioning/post closure have not yet determined. While there would potentially be increased employment required for decommissioning in the long-term this would result in elimination of long-term employment positions, decreases in local expenditures and a likely decrease in contributions to local taxes.

It is anticipated that there will be minimal disruption to the use and enjoyment of businesses and agricultural farms within the local area during post-closure activities. Potential disruptions could be caused by physical effects from noise and visual aesthetics.

400,000 tpy Scenario

Should the Facility be expanded to receive a waste throughput of 400,000 tpy, it is expected that overall there would be positive net effects on the economic environment within the LESA and RESA for the majority of economic criterion and indicators assessed in this Study.

Summary

Overall, the Project is expected to generally have positive net effects on the economic environment within the local and/or regional areas, as defined by the *Economic Assessment Technical Study Report* for the majority of economic criterion and indicators assessed in this Study. The economic effects of the Project will benefit the local and regional areas through increased employment opportunities, addition of wages, potential growth in various service sectors, and providing a more sustainable economic community base. The Project could also provide some economic benefit to assist in alleviating the effects of the economic downturn in the Region.

There would be minimal potential to disrupt use and enjoyment of local businesses or agricultural farms (located within 1 km of the Site). The only net effects regarding the disruption of use and enjoyment of local businesses within 1 km of the Site would be due to temporary/short-term noise and/or visual effects during construction and due to visual effects during operations both of which would be reduced through proposed mitigation measures.

The approved Host Community Agreement between the Municipality of Clarington and the Region of Durham, provides direct economic benefit to the Municipality of Clarington in the form of direct investment in local infrastructure (e.g., investment in supporting infrastructure for the CEBP). (The Regional Municipality of Durham, 2009)

8.0 CLOSURE

This Report has been prepared by Jacques Whitford Stantec Limited. The assessment represents the conditions at the subject property only at the time of the assessment, and is based on the information referenced and contained in the Report. The conclusions presented herein respecting current conditions, and potential future conditions are at the subject property resulting from the Project, represent the best judgment of the assessor based on current environmental standards. Jacques Whitford Stantec Limited attests that to the best of our knowledge, the information presented in this Report is accurate. The use of this Report for other projects without written permission of Durham Region, York Region and Jacques Whitford Stantec Limited is solely at the user's own risk.

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