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# GEDC ECONOMIC DEVELOPMENT STUDY

Greenstone Economic Development Corporation



**SNC LAVALIN INC.**

ENVIRONMENT & WATER

**02 | 02 | 2016**

FINAL REPORT

(Amended 29 June 2016)





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Report Title : GEDC Economic Development Study		02/02/2016
Project Number : 630931	Client : Greenstone Economic Development Corporation	Final Report / V-00



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# 1 INTRODUCTION

## 1.1 STUDY CONTEXT

SNC-Lavalin Inc. (SLI) is pleased to submit this report to Greenstone Economic Development Corporation's (GEDC). The main objectives of this Economic Development Study are to identify the opportunity for, and type of business expansion that could be expected in the Greenstone region, as a result of planned economic activity such as the expansion of the Greenstone Gold facility. The Study is also intended to examine the potential scope and scale of growth that can be anticipated within the coming years.





## 2 GREENSTONE ECONOMIC DEVELOPMENT CORPORATION (GEDC)

### 2.1 GEDC OBJECTIVES

Greenstone Economic Development Corporation (GEDC) is a community-based, not-for-profit organization which represents the communities within the Greenstone area (Aroland First Nation, Beardmore, Caramat, Geraldton, Ginoogaming First Nation, Jellicoe, Lake Nipigon Ojibway First Nation, Longlac, Long Lake #58 First Nation, Macdiarmid, Nakina, Rocky Bay First Nation and Orient Bay).

GEDC plays an integral role in fostering growth in all economic sectors within the Greenstone Service Area. Their key goals are as follows:

- Developing and implementing project-oriented regional strategic plans, prioritized according to community needs, which stimulate region-wide enterprise development and new employment.
- Developing public and private sector partnerships which provide a coordinated approach to socio-economic development.
- Promoting awareness of the importance of all sectors in the Region's economy and their value and opportunities to other stakeholders.
- Providing knowledge, support and encouragement to existing and potential entrepreneurs

### 2.2 GEDC ROLE IN REGIONAL DEVELOPMENT

GEDC offers a wide range of programs and services to encourage and foster business development throughout the member communities. They assist in small business start-ups, and in the expansion and/or modernization of existing companies through a variety of programs which include business development loans, entrepreneurial training, and services designed to address issues impacting rural communities. GEDC, as part of the CFDC (Community Futures Development Corporation) network, carries out the following services:

- Strategic community planning and socio-economic development;
- Support for community-based projects;
- Business information and planning services; and
- Access to capital for small and medium-sized businesses and social enterprises

GEDC financial and support services assist entrepreneurs in attaining their goals, while providing economic opportunities throughout the region.



## 3 REGIONAL ECONOMIC CONTEXT

### 3.1 OVERVIEW OF REGIONAL ECONOMIC DEVELOPMENT POTENTIAL

The Municipality of Greenstone was established in 2001 through the amalgamation of the former Town of Geraldton, the Town of Longlac, the Township of Nakina, and the Township of Beardmore, as well as a large unincorporated area containing the smaller settlement areas of Caramat, Jellicoe, MacDiarmid, and Orient Bay. Greenstone is located proximate to the First Nations communities of Aroland, Ginoogaming, Long Lake 58, Sand Point, Rocky Bay, and Lake Nipigon Ojibway. The community and its aboriginal partners increasingly work together to develop economic opportunities and foster future potential, especially in the context of resource development such as forestry, the Ring of Fire and other mineral resource development opportunities.

The Greenstone area was initially established as a centre for the transportation industry, acting as a service centre for the Transcontinental Railway System. From those beginnings, the local economy has grown with activity in the gold mining, pulp and paper, and tourism industries. Recent interest in northern Ontario related to the Ring of Fire has prompted much speculation about future economic development opportunities in the area. In 2007, Noront Resources announced significant mineral finds in the region relating to diamonds, nickel, copper, platinum, and palladium deposits. More recently, Noront has increased their holdings to include potential development of the large-scale Black Thor chromite deposit. Despite the challenges of developing these resources, there remains significant optimism.

From an economic development perspective, the Ring of Fire presents the opportunity for significant investment in the region. The scale of the opportunity suggests that it has the potential to be one of the primary drivers of economic development in Greenstone and beyond over the longer term, likely becoming the key driver of economic development in the Greenstone region within the next 20 years, for many years to follow. Over the coming 5 to 10 years it will be important for Greenstone, their partners and the GEDC to prepare strategic plans which help to contribute to development while ensuring the growth is sustainable from the social, cultural, environmental, and economic perspectives.

In the near term, there are challenges for the Ring of Fire development. One of the key challenges is the financing and establishment of infrastructure into the mineralized zone, which is suitable to the needs of the mine operators, while being economically feasible and adaptable to the needs of the aboriginal and non-aboriginal communities in the Region. At the community level, there are questions about potential social and environmental impacts of these development opportunities, and the community's capacity to support the scale of future development currently being considered. Members of the First Nations in the Region have also raised questions about the Ring of Fire development, highlighting the need to develop strategic community and economic development plans that are inclusive of all members of the region, and reflective of community goals and values.

Despite the economic development potential and the challenges associated with the Ring of Fire development, it is important for local communities to be prepared in advance of this development, through comprehensive economic development planning. However, with the long-term outlook for



this potentially massive development, it is also important to foster the development of nearer term opportunities, that are smaller in scale, but more likely to contribute economic development benefits within the next 5 to 10 years, such as the proposed Greenstone Mining gold project, the proposed TransCanada Pipelines Energy East bitumen pipeline and ancillary activities and the potential Northland natural gas-fired electricity generation facility.

This Economic Development Study is the beginning of what will likely become a broader, more comprehensive long-term economic development strategy for the Region, with contributions from a number of participating agencies and partners. The Study has been prepared to provide the GEDC with a preliminary understanding of the scope and scale of short and long-term economic development opportunities in the Region, and to provide an adaptive tool that can be used to examine the scale and potential economic impact of economic growth resulting from the development of these opportunities.

This Study has been developed following thorough research and data analysis. While the scale of potential mineral development in the region necessitates a heavy focus and emphasis on the mining sector, this Study also examines the economic potential of other sectors that are complementary to mining sector development and diverse, sustainable community economic growth.

## 3.2 DEMOGRAPHICS

### 3.2.1 Population

The population of the Municipality of Greenstone has experienced a historic reduction in recent years (2001 to 2012), compared to the increase experienced by the Province of Ontario, as a whole, over the same timeframe. Much of the decline is due to out-migration following the downturn in the forestry industry. As shown in Table 1, below, the reduction levelled off between 2006 and 2012.

**Table 1: Population Change**

	2001	2006	2012
Greenstone Population Count	5,662	4,906	4,803
% Change from Previous Census		-13.4%	-2.1%
	2001	2006	2012
Ontario Population Count	11,410,046	12,160,282	13,364,603
% Change from Previous Census		6.6%	9.9%

Source: Greenstone Community Profile 2015. February 2015

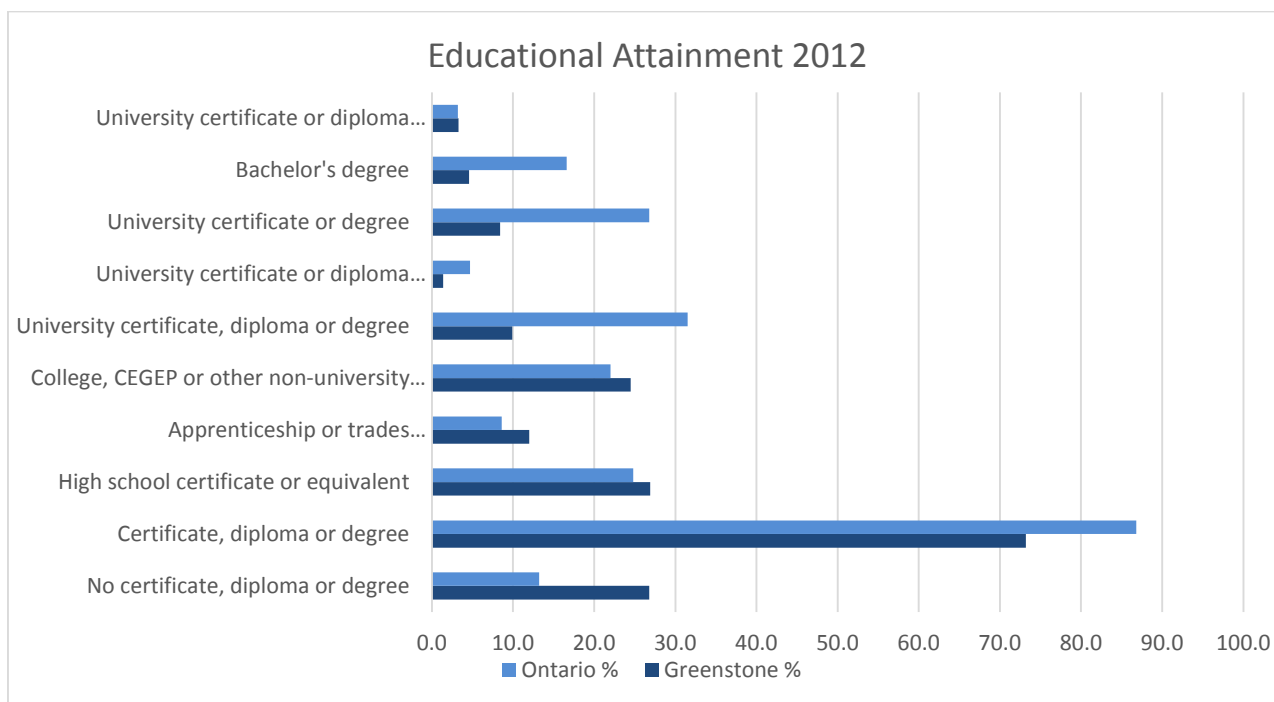
### 3.2.2 Educational Attainment

As shown in Table 2 and Figure 1, below, roughly 74% of Greenstone residents have a certificate, diploma or degree. Although this is lower than the overall provincial average, Greenstone has a higher percentage of people trained in the skilled trades than the provincial average.

**Table 2: Greenstone Educational Attainment**

Characteristics	Greenstone	Greenstone %	Ontario %
Total population 25 to 64 years	2,714		7,387,695
No certificate, diploma or degree	726	26.8	13.2
Certificate, diploma or degree	1,988	73.2	86.8
High school certificate or equivalent	731	26.9	24.8
Apprenticeship or trades certificate or diploma	325	12.0	8.6
College, CEGEP or other non-university certificate or diploma	665	24.5	22.0
University certificate, diploma or degree	268	9.9	31.5
University certificate or diploma below bachelor level	39	1.4	4.7
University certificate or degree	229	8.4	26.8
Bachelor's degree	124	4.6	16.6
University certificate or diploma above bachelor level	90	3.3	3.2
Degree in medicine, dentistry, veterinary medicine or optometry	0	0.0	0.7
Master's degree	15	0.6	5.4
Earned doctorate	0	0.0	0.9

Source: Greenstone Community Profile 2015. February 2015

**Figure 1: Educational Attainment**


Source: Greenstone Community Profile 2015. February 2015



### 3.2.3 Labour Force

The unemployment rate is higher in Greenstone compared to the Ontario average, however the labour participation rate is higher for the population aged 15 years or older.

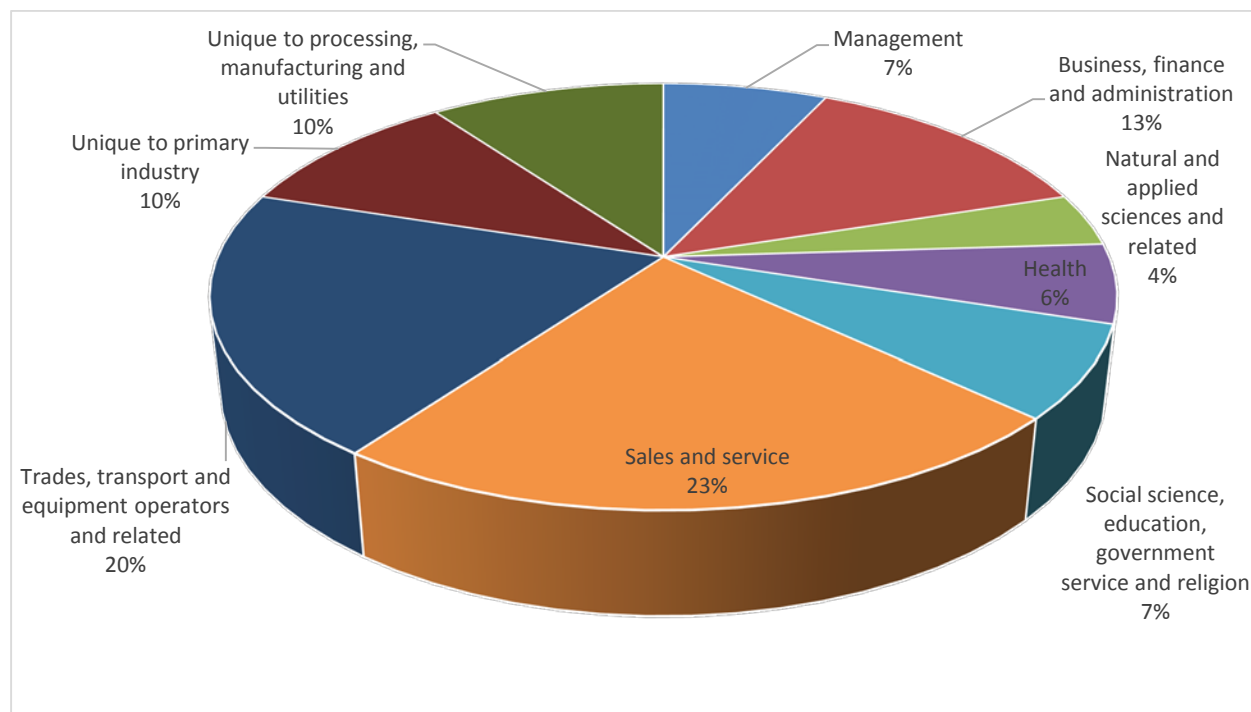
**Figure 2: Labour Force Characteristics**

Characteristics	Greenstone	Ontario
Total population, aged 15 years and older	4,005	11,096,917
In the labour force	2,787	7,111,304
Employed	2,430	6,500,308
Unemployed	356	610,996
Not in the labour force	1,218	3,985,614
Participation rate	69.6%	64.1%
Employment rate	60.7%	58.6%
Unemployment rate	12.8%	8.6%

Source: Greenstone Community Profile 2015. February 2015

The distribution of occupation type for the Municipality of Greenstone is illustrated in Figure 3.

**Figure 3: Labour Force by Occupation**



Source: Greenstone Community Profile 2015. February 2015



Occupation in the sales and service sector represents the largest percentage (23%) in Greenstone. The percentage of the labour force in trades, transport and equipment operators and related occupations is also large. The demographics of the Municipality of Greenstone illustrate that the skills required to be suppliers in the supply chain for development projects exists, however it should be a strong imperative on Greenstone residents to acquire their Grade 12 diploma and attain skills that will be in demand as the economy grows and diversifies.

### 3.3 FIRST NATIONS

#### 3.3.1 Animbiigoo Zaagi'igan Anishinaabek (AZA) – Formerly Lake Nipigon Ojibway First Nation

Formerly known as Lake Nipigon Ojibway First Nation, AZA is a First Nation community with members located all across Northwestern Ontario and beyond. The community is rich in culture and heritage with a long, storied past. AZA has a total population of 484 members (96 on reserve, 389 off reserve)<sup>1</sup>. The community population is comprised of 23 percent Elders (50+ years of age), 50 percent adults (18-49 years of age) and 27 percent youth (0-17 years of age). Community members are primarily located throughout Northwestern Ontario and are employed in a variety of occupations. Some of the members of AZA are also entrepreneurs in a variety of sectors such as a stone cutting, polishing and engraving, a cleaning services and handmade jewellery design.

The AZA First Nation Economic Development Department<sup>2</sup> is working on many community and economic development projects and partnership, such as:

- Water Power Generation (OPG and the Little Jackfish River Project);
- Water Power Generation (AXOR and the Namewaminikan River Project);
- Tourism – Resort Lodge Development;
- Electricity Transmission;
- Mineral Exploration opportunities in the Beardmore and Geraldton Area (Claims Map);
- Windpower opportunities on the east side of Lake Nipigon; and,
- Landmark Hotel.

#### 3.3.2 Bingwi Neyaashi Anishinaabek (BNA) – Formerly Sand Point First Nation

Bingwi Neyaashi Anishinaabek (BNA), formerly known as Sand Point First Nation, is a progressive Ojibway community located on the southeastern shores of Lake Nipigon in northwestern Ontario. BNA is part of the Robinson Superior Treaty, and its traditional territory spans across the Lake Nipigon Region and beyond. BNA's land base is located in what was formerly the Lake Nipigon Provincial Park, which the community finally reclaimed through an Order in Council in April, 2010 after decades of displacement. BNA's membership consists of over 262 members and growing (89 on reserve, 173 off reserve)<sup>1</sup>. The First Nation is a member of the Nookiwin Tribal Council and is a member of Waaskiinaysay Ziibi Inc. (WZI), an economic development corporation that was formed

<sup>1</sup> AANC website: <http://pse5-esd5.ainc-inac.gc.ca/fnp/Main/index.aspx?lang=eng>

<sup>2</sup> AZA First Nation website: <http://www.aza.ca/article/aza-economic-development-125.asp>



with four other Lake Nipigon First Nations in regards to a potential partnership on the Little Jackfish River Hydroelectric Project and transmission line.

The community has established its own development corporation; “Papassay Management Corporation”, which currently hosts several business operations on behalf of the community. Papassay’s projects include a cedar sawmill, a pellet mill (50% partnership with AZA), aggregate services, a co-generation facility, a 5-star eco-tourism lodge and cottages, a long-term Elder care facility, mining opportunities and numerous energy projects including wind (51% equity partnership between BNA, BZA, and AZA), solar and other hydroelectric initiatives, including a partnership on the Namewaminikan Hydro Project with BZA and AZA<sup>3</sup>.

### 3.3.3 Rocky Bay First Nation – Biinjitiwaabik Zaaging Anishinaabek

Biinjitiwaabik Zaaging Anishinaabek (BZA), formerly known as Rocky Bay First Nation, is a First Nation community nestled in the mountains on the southeast shore of Lake Nipigon. BZA has a total registered population of 735 with 340 individuals living on-reserve<sup>1</sup>.

The mandate of the Economic Development Department at BZA is to promote and enhance economic opportunities, including program and service delivery to Band Members with varying aspects of economic development, including tourism, resource development, skills training and community expansion. BZA is actively engaged in creating an attractive atmosphere for potential investors and in promoting the First Nation as a business leader.

BZA is currently involved in several economic development projects<sup>4</sup>, including:

- Rocky Bay Fisheries;
- Little Jackfish River Project;
- Wind Energy; and,
- Lands and Resources Program.

### 3.3.4 Long Lake #58 First Nation

Located on Highway 11 approximately 300 kilometers north east of Thunder Bay and approximately 2 kilometers west of the town of Longlac, in the Municipality of Greenstone, Long Lake #58 First Nation sits in between the TransCanada Highway and the Canadian National Railway. The total population of Long Lake #58 First Nation is 1,509 people with 501 people living on-reserve<sup>1</sup>. The First Nation has an Economic Development Corporation through which they conduct business according to the Long Lake #58 First Nation Economic Development Plan<sup>5</sup>.

- Solar project;
- Warehouse Project;

<sup>3</sup> Papassay Management Corp. website: <http://papassay.ca/>

<sup>4</sup> BZA First Nation website: <http://www.rockybayfn.ca/>

<sup>5</sup> Long Lake first Nation website: <http://www.longlake58fn.ca/>



It is also expected that Long Lake #58 will participate in:

- Ring of Fire Project;
- Kenogami Forest Project;
- Energy East Pipeline Conversion Project; and
- Premier Gold Project.

### 3.3.5 Aroland First Nation

Aroland First Nation is located 352 km northeast of the city of Thunder Bay and 78 km north of Geraldton. The total registered population as of 2008 is 700 Band Members with 300 individuals residing on reserve.

The Aroland First Nation's past and current economic development projects include the construction of the Johnny Therriault School, a Senior's Complex, band office, Health Centre, Nishnawbe-Aski Police Service, and Tikinagan Child and Family Services. Several local area businesses such as the Gas Bar, Convenience Store, Tourist Outfitters and Taxi Company have appeared in recent years<sup>6</sup>.

### 3.3.6 Ginoogaming First Nation

Ginoogaming First Nation (formerly Long Lake #77 First Nation) is a small Anishnawbe (Ojibway) First Nation located approximately 40 kilometres east of Geraldton, in the Municipality of Greenstone. The community is located on the northern shore of Long Lake, immediately south of Long Lake #58 First Nation and the community of Longlac. As of September, 2006, the total registered population was 938 Band members with 215 individuals residing on the reserve.

Ginoogaming First Nation has established the Rocky Shore Development Corporation (RSDC). The corporation, known as RSDC, operated for two years but limited funding did not allow the First Nation to adequately investigate resource and economic development initiatives.

RSDC is concentrating on 32 separate projects, including<sup>7</sup>:

- Restarting the random waferboard plant in Longlac;
- Making Ground River Bridge and Road reconstruction;
- Wind Farm Project;
- Gaming activities;
- Long Lake Dam Hydroelectric; and
- Woodpecker Project

## 3.4 ADVANTAGE NORTHWEST: MINING READINESS STRATEGY

The Advantage Northwest: Mining Readiness Strategy (MRS) illustrates the massive potential that exists for the mining industry to contribute substantially to the gross domestic product (GDP) of

<sup>6</sup> Aroland First Nation website: <http://community.matawa.on.ca/>

<sup>7</sup> Ginoogaming First Nation website: <http://www.ginoogamingfn.ca/>



Northwestern Ontario, the remainder of Ontario and the whole of Canada. Economic analyses were completed on 10 mining projects that are in an advanced stage of exploration and feasibility studies. They were selected because there is a higher degree of confidence that these projects will be developed based on the information obtained to date, than many others which are not included in the economic analyses conducted for this Report.

Based on the 10 projects that were analyzed the potential growth to Ontario's annual GDP over the period 2012 to 2021 was estimated to be in the order of \$1.5 billion, with increased government revenues (all levels combined) in the order of \$0.5 billion per annum.

Highly respected geologists with much knowledge and experience in Northern Ontario are convinced that the resource potential of Northwestern Ontario should be similar to that of Northeastern Ontario and given that Northwestern Ontario is almost double the size of Northeastern Ontario, there is potential for the Region to become a more important mining region.

Some of the projects that were examined in the MRS will require substantial infrastructure investments in transportation and energy supply which when implemented will likely have a positive impact on further exploration activities, creating a "snowball" effect.

It was estimated that almost 10,000 jobs per year will be created in Ontario from the 10 projects analyzed in the study through direct, indirect and induced economic activity. A majority of the jobs created by increased mining activity will require high skill levels and will be compensated accordingly. All of the projects are located within or close to First Nations communities and accordingly will provide substantial opportunities for Aboriginal employment, contracting opportunities and project ownership and control, in meaningful and challenging sectors of the economy.

The Mining Readiness Strategy outlined the steps that would need to be taken in developing; energy infrastructure, transportation infrastructure, Municipal and First Nation Infrastructure, Education and Training, Supply Chain, Project Development and Financing Strategies and Socioeconomic issues to ensure that mining investment translated into long term growth.

This Strategy also provided an outline to maximize the retention of economic benefit within the region. Many parallels can be drawn between the Mining Readiness Strategy and the GEDC Economic Development Study, and it is expected that many of the Strategy's recommendations to guide development can be applied to GEDC.



## 4 REGIONAL DEVELOPMENT

This section discusses development that has the potential to stimulate the local economy within the Greenstone area. These projects were selected because they are at feasibility phase and/or are proceeding through environmental assessment, and have good potential to commence construction within the foreseeable future. The projects included in this analysis were:

- Greenstone Gold Mine
- Brookbank Project
- Northland Power Project
- Energy East Pipeline
- Ring of Fire (Noront Resources Eagles Nest Nickel project and Noront Resources Black Thor chromite deposit)
- Various First Nations economic development initiatives

### 4.1 GREENSTONE GOLD MINES

The Greenstone Gold mine presents significant potential to drive economic potential on both the local and regional levels. On March 9, 2015 Centerra Gold and Premier Gold Mines Limited formed a 50/50 Joint Venture partnership to develop the Trans-Canada Property including the Hardrock Gold Project located in the Geraldton-Beardmore Greenstone Belt. The construction start date for this mine is projected to be the end of 2016 and is estimated to require \$410 million in capital expenditures.

This project has the potential to stimulate the local economy through a variety of industries within the mining supply chain. In addition to direct employment by the mine, the potential for local businesses to service key contracts will serve as a means for local business development and growth. Key expenditures that will be made by the mine are outlined in Table 3 below.

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**Table 3: Life of Mine Expenditures – Greenstone Gold Mine**

Description	Quantity	UoM	Capital Costs
Highway 11 and Infrastructure Relocation Allowance	5	LS	\$32,901,796
Site Clearing	1	LS	\$757,950
Internal Site Access Roads	1	LS	\$769,546
Parking (Areas 1,2, 3 & Substation)	1	LS	\$1,216,236
Fencing	80000	Metre	\$1,280,000
Office/Administration Building & Dry (300 Man)	1	Each	\$4,686,000
Nine (9) Bay Open Pit Garage/Maintenance Facility & Warehouse	1	LS	\$13,140,000
Electrical Station	1	Each	\$780,000
Existing Substation Upgrades	1	LS	\$132,000
Security Building	1	Each	\$100,000
Assay Lab	1	Each	\$1,200,000
Mining Camp Trailers	1	Each	\$250,000
Backfill Levelling for Trailers	1	LS	\$5,000
PAG Waste Storage Pad (Low grade waste storage area on site plan)	1	LS	\$3,640,000
Ore Storage Pads (x3)	1	LS	\$1,437,632
NAG Waste Storage Pad (Main waste storage area on site plan)	1	LS	\$1,524,800
NAG Temporary Waste Rock Storage	1	LS	\$14,302
Dewatering Treatment and Distribution System	1	LS	\$7,515,363
Distribution	3000	Metre	\$624,029
Sanitary Water Treatment and Distribution System	1	LS	\$1,380,000
Distribution	3000	Metre	\$624,029
Surface and Process Water Distribution System	1	LS	\$1,014,029
Potable Water Treatment and Distribution System	1	LS	\$348,000
Fuel Storage (allowance)	1	LS	\$100,000
Explosives Storage (allowance)	5	Each	\$100,000
Final Services Connections to buildings (allowance)	1	LS	\$100,000
Electrical - Surface Infrastructure	0	LS	\$8,000,000
Phase One TMF & Polishing Pond	1	LS	\$10,583,037
Phase One Tailings and Water Pipelines	1	LS	\$18,222,400
Phase Two TMF Staged Dam Raises	1	LS	\$39,104,389
Phase Two Tailings and Water Pipelines	1	LS	\$9,856,000
Capital Purchases (incl. Freight)	1	LS	\$125,947,983
Equipment Salvage	1	LS	-\$5,837,693
Phase One Mill On Site Construction	1	LS	\$226,102,499
Phase Two Mill On Site Construction	1	LS	\$122,918,407
Mill Salvage	1	LS	-\$12,600,000
Closure Costs (Provided by Stantec Environmental)	1	LS	\$26,028,286
Contingency (Pre-Production Only - Includes Mill and Tailings)	1	LS	\$116,361,216
Closure Plan	1	LS	\$500,000
Permitting	1	LS	\$500,000
EPCM Services 1	1	LS	\$6,564,610
<b>Total LOM Capital</b>			<b>\$767,891,846</b>

Source: Technical Report on the Trans-Canada Property. Premier Gold Mines. February 2015

A key opportunity for local businesses will be construction and operation of the temporary construction camp. This camp will likely be in operation for the three year construction period and will require a variety of goods and services. Additionally, recreational activities will not be provided on the camp site which serves to promote integration of the construction workforce with the Greenstone community. This could lead to a spike in revenue for local recreational facilities due to the spending of the projected 800 person workforce required during the construction period.



Locals with appropriate educational levels and expertise may also be able to benefit from the direct mining employment required over the lifespan of the mine. The direct mining employment required is outlined in Table 4 below.

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**Table 4: Labour Requirements – Greenstone Gold Mine**

Description	Year															
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
<b>G&amp;A Services</b>																
Mine Manager	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HR Superintendent	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
HR Clerk	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Recruiter	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Mine Clerk (Document Mgmt)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Receptionist/Office Administrator	1	2	2	2	2	2	2	2	2	2	2	2	2	1	0	0
Accountant	1	2	3	3	3	3	3	3	3	3	3	3	3	2	1	1
Purchasing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Warehouse Clerk (Shipping/Receiving)	4	4	6	6	6	6	6	6	6	6	6	6	6	4	2	2
H&S Coordinator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H&S Trainer	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0
Environmental Coordinator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Environmental Technician	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
IT	1	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0
Security/First Aid Person	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Dryman	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2
Chief Geologist	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
Chief Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
Long Range Planner Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
Mech. Eng.	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
Elec. Eng.	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
Yard Man	4	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4
<b>Technical Services</b>																
Chief Geologist	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0

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Description	Year															
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Senior Geologist	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Geological technician	0	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Pit geologist	2	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
<b>G&amp;A Services</b>																
Sampler	2	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Chief Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Long Term Planner engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Production Engineer	1	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Surveyor	2	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Rock mechanic Engineer	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Drill and Blast Technician	1	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
<b>Maintenance</b>																
Mainainance Superintendent	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Chief mechanic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Foreman Mechanics	1	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Mechanics	6	22	22	22	22	22	22	22	22	22	22	22	22	22	8	8
Mechanic helpers	2	10	10	10	10	10	10	10	10	10	10	10	10	10	4	4
Mechanical Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Planner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Welder	0	6	6	6	6	6	6	6	6	6	6	6	6	6	1	1
Machinist	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>Supervision Operation</b>																
Superintendent	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Mine Captain	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Shift Boss	4	8	8	8	8	8	8	8	8	8	8	8	8	8	0	0
Mine clerk	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
<b>Operation</b>																
Driller - Drill & Blast	4	8	8	16	16	16	16	16	16	16	16	12	8	4	0	0

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Description	Year															
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Driller helpers	0	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Sharpener - Drill & Blast	0	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Shovel Operators	4	8	8	12	12	12	12	12	12	12	12	12	8	8	0	0
Loader operator	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Truck Drivers	12	24	24	40	40	40	44	52	52	52	52	52	32	16	4	4
Dozer Operators - Road & Dump	2	16	16	16	16	16	16	16	16	16	16	16	12	8	0	0
Grader Operators - Road & Dump	0	8	8	8	8	8	8	8	8	8	8	8	4	4	2	2
Service operator - Service	4	16	16	16	16	16	16	16	16	16	16	16	16	16	4	4
Labourer - Service	0	16	16	16	16	16	16	16	16	16	16	16	16	4	0	0
Trainer - Supervision	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
<b>Mill &amp; Assay Lab</b>																
Mill/Assistant Mill Superintendent	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Trainer - Supervision	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Technical (Metallurgist, Technician)	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8
General Operations/Shift Foreman	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Operators (Crushing, Grinding, CIL)	16	16	16	16	18	18	18	18	18	18	18	18	18	18	18	18
Mechanical/Electrical Planner	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Maintenance Foreman (Mech, Elec)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Maintenance (Millwright, Welder)	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12	12
Electrician/Instrumentation Technician	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8
Site Services	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Chief Chemist	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Technicians (Sample Prep, Wet Lab, Assays)	11	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12
<b>Total Hourly &amp; Staff</b>	<b>159</b>	<b>297</b>	<b>300</b>	<b>328</b>	<b>336</b>	<b>336</b>	<b>340</b>	<b>348</b>	<b>348</b>	<b>348</b>	<b>348</b>	<b>344</b>	<b>308</b>	<b>258</b>	<b>123</b>	<b>123</b>

Source: Technical Report on the Trans-Canada Property. Premier Gold Mines. February 2015

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## 4.2 BROOKBANK PROJECT

The Brookbank gold project is located 77 km west of Hardrock and can potentially proceed into construction within the foreseeable future. This project is a Joint Venture between Greenstone Gold Mines and Metalore Resources Ltd. A summary of capital investment for this project is shown in Table 5 below.

**Table 5: Life of Mine Expenditures – Brookbank Project**

Description	UoM	Capital Costs
<i>Engineering and Permitting</i>		
Detailed Engineering (mill engineering included in mill costs)	\$1,500,000	\$1,500,000
Closure Plan	\$500,000	\$500,000
Permitting	\$500,000	\$500,000
<b>Subtotal Engineering and Permitting Costs</b>	<b>\$2,500,000</b>	<b>\$2,500,000</b>
<i>Capital</i>		
Brookbank Surface Infrastructure Construction	\$20,303,971	\$20,303,971
Beardmore Surface Infrastructure Construction	\$3,229,507	
Underground Infrastructure Development	\$33,627,457	\$33,627,457
Underground Infrastructure Construction	\$3,930,313	\$3,930,313
Capital Equipment Procurement	\$21,520,175	\$21,520,175
Beardmore – Northern Empire Mill Expansion (including salvage reduction)	\$53,853,000	
Hardrock TMF		\$1,000,000
<b>Subtotal Capital Costs</b>	<b>\$136,464,424</b>	<b>\$80,371,916</b>
<b>Contingency (pre-production only, excluding mill)</b>	<b>\$21,230,715</b>	<b>\$20,561,863</b>
<b>Total Brookbank Capital Costs Including Contingency</b>	<b>\$160,195,139</b>	<b>\$103,433,779</b>
<i>Studies</i>		
Environmental Baseline Study	\$1,500,000	\$1,500,000
Prefeasibility Study	\$750,000	\$750,000
Feasibility Study	\$1,000,000	\$1,000,000
<b>Subtotal Study Costs</b>	<b>\$3,250,000</b>	<b>\$3,250,000</b>
<b>Total Brookbank Capital Costs</b>	<b>\$163,445,139</b>	<b>\$106,683,779</b>

Source: Technical Report on the Trans-Canada Property. Premier Gold Mines. February 2015

This Brookbank project to a large extent is dependent on the Hardrock project moving into its construction phase due to the need for the infrastructure that will be developed as part of that project. It has the potential to further contribute to the development of the Greenstone region as a viable supplier for the mining industry.



#### 4.3 ENERGY EAST PIPELINE

The development, construction and operation of the TransCanada Pipeline Ltd. (TCPL) Energy East pipeline is projected to create thousands of jobs and tangible economic opportunities along the entire length of the pipeline corridor. The project has the following major components:

- Converting an existing natural gas pipeline to an oil transportation pipeline. It will have a capacity of 1.1 million tpd
- Constructing new pipelines in Alberta, Saskatchewan, Manitoba, Eastern Ontario, Québec and New Brunswick to link up with the converted pipe.
- Constructing the associated facilities, pump stations and tank terminals required to move crude oil from Alberta to Québec and New Brunswick, including a marine facility that enables access to other markets by ship

While the exact route will only be determined after public and regulatory review, the planned starting point is a new tank terminal in Hardisty, Alberta. The terminal in the Saint John area, New Brunswick will include facilities for marine tanker loading. The pipeline portion that traverses the study area will not require new pipeline construction. The existing natural gas pipeline will be converted to carry bitumen projects. In the Greenstone area, the key development activity will be replacement of the natural gas compressor stations to bitumen product pumping stations.

Three (3) to four (4) pumping stations are being planned within the Greenstone area at a total estimated capital cost of \$25 million per station. The stations are planned to be located at:

- Nipigon;
- Jellicoe;
- Geraldton; and
- Klotz Lake.

There is also the potential for camps and/or local accommodation use during construction. Employment in building and pipeline trades and services may be available for both the pipeline and facilities work associated with the project. Additionally, there may be increased spending from additional TransCanada personnel living in the communities

#### 4.4 NORTHLAND NATURAL GAS GENERATION POWER PROJECT

Ontario's Independent Electricity System Operator (IESO) has stated in its Greenstone-Marathon Regional Plan<sup>7</sup> that up to 150 MW of new power capacity is required in the Greenstone region to service prospective industrial projects. In Greenstone, the new power capacity will be required to

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<sup>7</sup> <http://www.ieso.ca/Pages/Ontario%27s-Power-System/Regional-Planning/Northwest-Ontario/Greenstone-Marathon.aspx>



supply regional loads - Greenstone Gold Mine's Hardrock Mine by mid-2018 and TCPL's Energy East oil pumping station loads by 2020.

Total electricity demand is estimated at 35 MW from Greenstone Gold Mines and 60 MW from TCPL. Approximately 90 MW of this generation will have to be supplied by new generation supply.

Northland Power Inc (NPI) is proposing to construct a new natural gas-fired electricity generation facility with an installed capacity of approximately 100 MW plus any transmission interconnections that would be required to supply various projects.

The generation station could be located at one of three prospective sites:

- Site 1 – Option a parcel from Premier Gold;
- Site 2 – Option a parcel from Tombill Mines; and
- Site 3 – Option a parcel from the Municipality of Greenstone.

The project would include connecting to the existing 115 kV line near the Long Lac Transmission Substation, located in Geraldton.

Up to 35 MW of the planned capacity of the NPI facility would be expected to be delivered to the proposed Greenstone Gold Mine Hardrock gold project. Up to 60 MW could be supplied to the 4 pumping stations proposed by TCPL, plus the necessary transmission connections. The generation station can easily be expanded as power demand in Greenstone increases over time.

#### **4.4.1 Transmission Line Upgrades**

The upgrade of the transmission line from Nipigon to Geraldton from 115 kV to 230 kV can be planned, funded and built after the year 2020 without holding up the Greenstone Gold Mine and TCPL projects while adding additional capacity and reliability of the electricity supply.

With the NPI facility in place, the Greenstone municipality will be served by a local, reliable power supply that will be available for any future load growth. The project is being designed to accommodate a phase 2 expansion which would serve new mines and processing facilities in and around the Ring of Fire area.

#### **4.5 RING OF FIRE**

The Ring of Fire is the name given to the large area rich in metallic mineral deposits located in the James Bay Lowlands in Ontario's Far North. The Ring of Fire, which covers 5,000 square kilometres, is estimated to hold multi-generational potential for mineral extraction. Beginning in the early 2000s, the region has witnessed significant discoveries of chromium, nickel, copper, zinc, platinum, and gold.

The Ring of Fire has been described as the most promising mineral development opportunity in Ontario since the discovery of the Sudbury Basin in 1883 and the Timmins gold camp in 1909.



Previous economic analysis conducted by the Ontario Chamber of Commerce found that over the first ten years of development, it is estimated the Ring of Fire will generate up to \$9.4 billion in GDP, sustain up to 5,500 jobs annually, and generate \$2 billion in government revenue, divided between the federal, provincial, and municipal governments. Despite its significant potential, little progress has been made to realize the benefits of the Ring of Fire. After a year of delays, public and expert perception on the viability of the Ring of Fire as a sound economic investment has soured.

While the departure of Cliffs Natural Resources—the American iron ore firm that previously held claims and assets in the Ring of Fire—has left the Ring of Fire without a major mining firm capable of injecting much needed private sector capital in infrastructure, other variables have contributed to a sluggish pace of development. Noront Resources recently purchased the rights to these claims and assets. KWG remains active on its Ring of Fire properties and has recently signed an MOU with China Rail First Survey & Design Group Co. Ltd with respect to conducting a feasibility study on the proposed railroad from Nakina to their properties with chromite deposits in support of seeking financing. Among the most significant barriers to development is the absence of agreements with the affected First Nations communities, delays in permitting, and the reluctance of the federal government to make an explicit funding commitment to Ring of Fire infrastructure.



## 5 ECONOMIC DEVELOPMENT MODEL FINDINGS

This section provides an analysis of the economic impact (economic growth) that can realistically be realized within the Municipality of Greenstone as a result of the development of the projects discussed in Section 4.0 which are in the advanced stages of engineering, economic feasibility and environmental assessment.

In addition to the direct growth that will occur as a result of capital investment, construction and operations, growth is also expected to occur as a result of economic activity (“spin-offs”) throughout the supply chain.

### 5.1.1 Introduction to GEDC Economic Development Model

The economic development model developed for GEDC has been designed as an adaptive tool that can be altered as economic conditions change, as new projects are identified, and as conditions change for the projects discussed in Section 4.0 (eg. changes in capital investment and employment projections, and/or schedule changes). Due to the volatile conditions which affect development projects generally, and mining projects in particular, it was determined that providing a flexible tool gives the GEDC the ability to better predict economic growth and to better guide existing and prospective local businesses toward the opportunities that are expected to develop as a result of growth throughout the region.

Economic activity resulting from mine development was calculated using the Input-Output data system and models maintained by Statistics Canada, as presented by Dungan and Murphy in their critically acclaimed studies, “*Mining: Dynamic and Dependable for Ontario’s Future*” and “*An Authentic Opportunity: The Economic Impacts of a New Gold Mine in Ontario*” prepared for the Ontario Mining Association in December 2012 and October 2014 respectively. These reports identified the upstream sectors that benefit as suppliers to the mining sector. By identifying the impacted sectors and quantifying an estimate of the cumulative benefit they could each realize, expressed as GDP growth, they provided a template for SLI to estimate the magnitude of the opportunity available to current suppliers and prospective new suppliers within the Greenstone region. .

A similar approach was used to quantify GDP growth as a result of other construction projects. The report “*The Economic Benefits of TransCanada’s Canadian Mainline Conversion Project*” presented by Deloitte Canada in August, 2013, provided the basis for the quantification of sector specific growth as a result of the other prospective development projects.

A snapshot of the Economic Projections Model, in addition to the assumptions used for this analysis, is shown in Appendix A.

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### 5.1.2 Direct, Indirect and Induced Impacts

There are three categories of activity that impact the economy: direct, indirect and induced. The direct impact includes the direct expenditure on wages and salaries for the project. This represents a direct injection of expenditure into the economy. The indirect impact includes wages and economic activity created by businesses which provide goods and services to the initial project. These expenditures include capital, supplies, materials and equipment. The induced impacts result from the spending and the resulting recirculation of employee incomes. Direct and indirect expenditures are categorized and valued from engineering estimates of potential expenditures. Induced spending is calculated using multipliers. The resulting total of all spending (direct, indirect and induced) results in the total economic impact of the project.

### 5.1.3 Economic Activity “Leakage”

In addition to selecting a reasonable multiplier of activity that is generated indirectly from the development of a project (often referred to as “spin-off” benefits), it is also important to estimate the relative proportion of the direct and indirect expenditures that will be spent within the economy. The rate of leakage of initial expenditures outside the economy can have a significant effect on the estimated growth of the economy. It is generally accepted that a capital and skill intensive industry like mining can result in a substantial portion of expenditures being made not only outside the immediate region of the project, but also outside the province and even the country. The net economic benefit of a project in the local region can only be estimated once the “leakage” rate is determined.

For the purposes of estimating economic growth for this Study, a leakage rate of 25 percent was selected based on the leakage assumption applied in the Dungan and Murphy study (2014). Dungan and Murphy maintain that well over 70 percent of the value of mining supplies and services is provided from within the province of Ontario, implying a leakage rate on expenditures of approximately 25 percent. Leakage is not something that is absolute.

Leakage rates can be reduced by a community or region's efforts to retain or maximize local expenditures. These efforts could include measures such as preparing and planning for anticipated future economic activity through efforts such as this Strategy.

## 5.2 SUMMARY OF REGIONAL INVESTMENT

The base information required for this analysis relates to project start date, duration and cost. Base information is listed in Table 6.

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**Table 6: Summary of Regional Investment<sup>8</sup>**

Project	Start Date	End Date	Construction Duration (Years)	Capex (\$M)	Opex/year (\$M)
Greenstone Gold Project	2016	2030	3	410	35
Energy East Pipeline	2017	N/A	2	100	N/A
Northland Power 300mv Project	2020	N/A	2	300	30
Black Thor Chromite	2025	2053	4	1450	900
Noront Resources Eagles Nest	2018	2028	3	610	97
Brookbank Gold Project	2018	2028	3	163	24
Transmission Line Upgrades	2020	2050	2	650	5

### 5.3 SUMMARY OF RESULTING POTENTIAL GDP GROWTH

The Economic Development Model developed for this project allows a number of scenarios to be investigated, including utilizing different probabilities of development projects moving into the construction phase, varying capital investment values, as well as the estimate for economic leakage rates out of the Municipality of Greenstone.

This section outlines the impact of what was determined to be the most likely scenario for development within the region. The details of this scenario are outlined in Table 7 below.

**Table 7: Summary of Regional Investment**

Project	Construction Probability (%)	Greenstone Retention	Start Date	End Date	Construction Duration (years)	Capex (\$M)	Opex/year (\$M)
GREENSTONE GOLD PROJECT	85%	50%	2017	2030	3	410	35
ENERGY EAST PIPELINE	35%	10%	2017	2040	2	100	0
NORTHLAND POWER 300MV PROJECT	35%	10%	2020	2050	2	300	10
TRANSMISSION LINE UPGRADES	35%	10%	2020	2050	2	650	5

It was determined that the Greenstone Gold Project is the most likely to go into the construction phase based on its feasibility study and client supplied information. The prospect of the

<sup>8</sup> Sources: Technical Report on the Trans-Canada Property. Premier Gold Mines. February 2015; Advantage Northwest, Mining Readiness Strategy. CEDC, 2013; Presentation to Greenstone Council-Greenstone Generation Project. Northland Power, 2015; Energy East Pipeline – Grow Greenstone Expo. TransCanada, 2014.

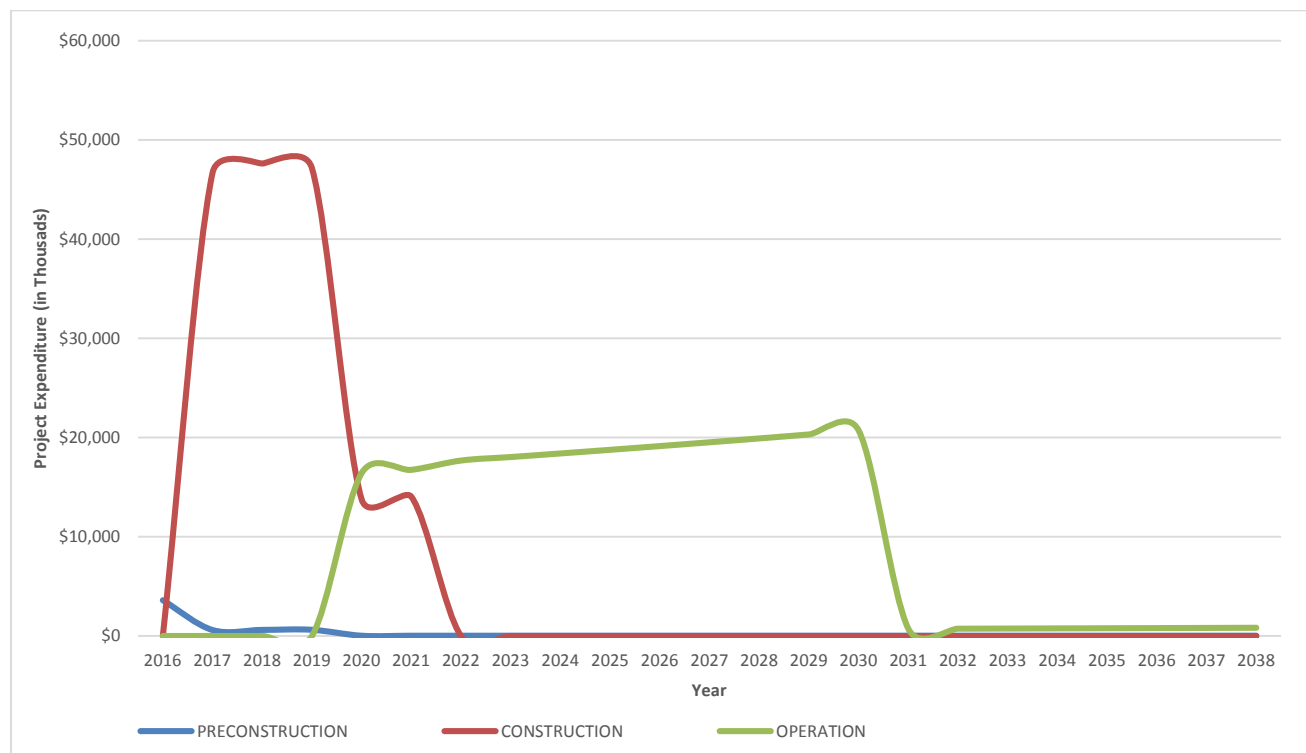


Greenstone Gold Project and Energy East Pipeline proceeding as planned will necessitate upgrades to existing power infrastructure. As a result, the Northland Power 300MV Project and Transmission Line upgrades were included as a part of this analysis.

It was inferred that the Greenstone Gold Project will have the highest levels economic retention within the Municipality of Greenstone due to the close ties held between GEDC and Greenstone Gold Mines. It is expected that Greenstone Gold will prioritize local contractors through its procurement plan, and GEDC will work with local businesses to maximize their ability to bid on contracts at the mine.

The Energy East Pipeline project, Northland Power 300MV Project and Transmission line upgrades have been assigned equivalent construction probability percentages as these projects are interrelated and dependant on each other's success. The economic retention within the Municipality was set at a conservative 10% level. With proper planning and consultation with the GEDC, retention rates could be improved.

**Figure 4: Greenstone GDP Growth**



As shown, the highest levels of expenditure as a result of development projects occurs between the years of 2017 and 2022, when construction of these development projects are scheduled to begin. Expenditures peak in 2018 at \$48.2 million within the Municipality. Average expenditures



within Greenstone over the 2016 to 2025 operating period are estimated to be \$28.4 million per year.

These expenditures were analysed using Statistics Canada Input Output Data Models to provide an estimate of supply chain impacts.

#### 5.4 DESCRIPTION OF KEY SUPPLY SECTORS

Mining and exploration companies operating in Ontario require a wide range of products, expertise and services from suppliers in commercial, industrial and consumer sectors of the economy. The mining supply chain describes the system involved in moving these products and services from a supplier to the mining operations. There will be considerable opportunities for suppliers to support the potential mining projects in Northwestern Ontario since investment in mining will result in creating quality jobs and GDP growth in upstream sectors.

Identification of the supplies needed for the prospective regional development projects provides insight into the potential for local suppliers to enter the mining supply chain. The objectives of GEDC should be to maximize the supplies purchased from local sources and thus minimize economic leakage from the Municipality of Greenstone.

This section discusses the opportunities available to suppliers and has used the study 2014 Dungan and Murphy study and “*Energy East: The Economic Benefits of TransCanada’s Canadian Mainline Conversion Project*” conducted by Deloitte Canada in August 2013 as a source of much of the data.

These studies used the input/output data system and models maintained by Statistics Canada to demonstrate the relationship between mining investment and resultant activity in other sectors. They illustrate the upstream sectors that benefit from being suppliers to the mining and energy sectors. By identifying the impacted sectors and quantifying the cumulative benefits they receive, expressed as GDP growth and employment, the opportunities available to existing suppliers and prospective suppliers within the region are presented.

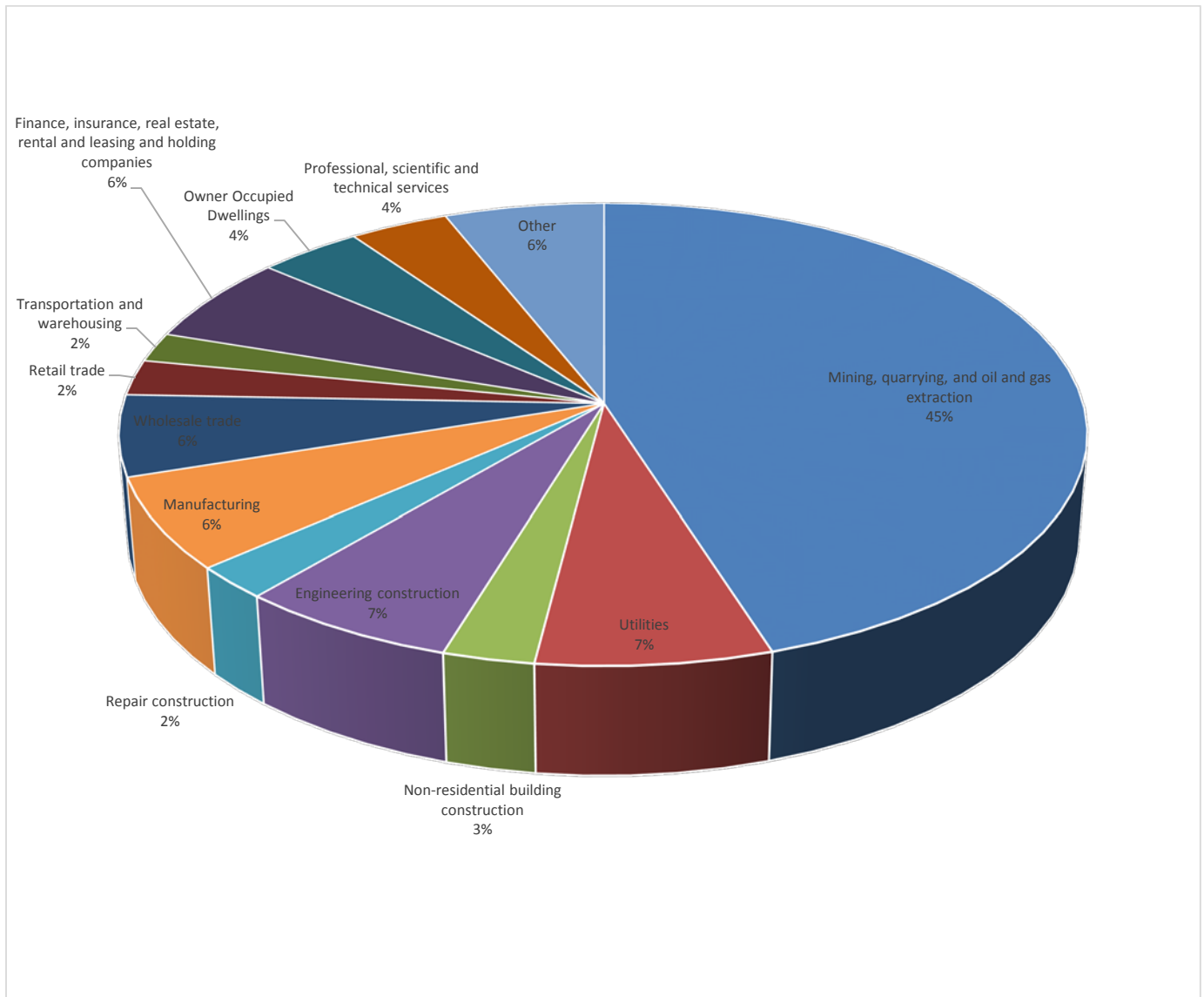
#### 5.5 QUANTIFICATION OF SUPPLY SECTOR OPPORTUNITY

Total direct, indirect and induced GDP impact retained within the Municipality of Greenstone is estimated to be \$48.9 million annually during the 2016-2025 time period resulting in approximately 423 jobs being sustained over that period. 43.5% of this GDP growth consists of relatively minor impact across a wide variety of sectors. These estimates can be viewed in Appendix A. Of the remaining 56.5% of GDP impact expected to be retained within the Municipality of Greenstone, the distribution is illustrated below.

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**Figure 5: Distribution of Direct, Indirect and Induced GDP Growth**



The largest impact on GDP occurs in the “Mining, quarrying, oil and gas extraction”. This accounts for roughly 45% (\$10.3 million annually) of resulting GDP growth. This is expected to account for 54 jobs being sustained over the 10 year period. The Construction sector collectively will realize approximately 12% (\$5.6 million annually) between engineering construction, non-residential building construction and repair construction. The construction industry is expected to create 66 jobs during this between 2015 and 2025.

Services such as financial services, insurance, real estate, automotive and other equipment leasing, and management of companies and enterprises result in 6% (\$2 million) of GDP growth. These services will add 12 jobs to the Municipality. This is followed by “Professional, Scientific



and Technical Services”, at 4% (\$1.6 million and 18 jobs) and wholesale and retail Trade combined at 8% (\$2.9 million and 35 jobs) of the indirect and induced GDP impact.

## 6 PROMOTING GREENSTONE

This section outlines the different pathways agencies such as GEDC as well as local Chambers of Commerce could take to prepare, position and promote local businesses to become viable suppliers in the mining services sector. Fostering relationships and preparing businesses to grow to meet the demand of the mining sector is key to maximizing the retention the economic benefits that can be realized from these projects within the Municipality of Greenstone.

### 6.1 GREENSTONE BUSINESS ADVOCACY

GEDC will play an integral role in guiding business readiness to meet the demand within all economic sectors as a result of regional development. To maximize local retention, GEDC could:

- Continue to liaise with mining, energy and infrastructure sectors to maintain an up-to-date understanding of development plans.
- Utilize the Economic Development Model developed as a part of this study to illustrate economic opportunity as a result of development projects.
- Identify local businesses that can meet the needs of development projects.
- Advocate for local procurement strategies from development projects within the Greenstone area.
- Work with local businesses to ensure that they can navigate procurement processes of mining/energy companies.
- Identify the potential to business owners for local suppliers to expand to meet a rising demand for products and services.
- Promote entrepreneurship where locals can enter areas of the supply chain that were not previously available within Greenstone.
- Promote partnerships through collaboration with the First Nations' Economic Development Corporations listed in Section 6.3.

### 6.2 BUSINESS CLUSTERS

A business cluster provides individual supply companies opportunities such as knowledge sharing, personal relationships and a motivating environment for long term benefits. An individual company in a cluster can operate on a larger scale through access to key inputs such as employees and suppliers, specialized knowledge, public infrastructure and goods and even financing. Clustering allows a relatively small company to attract and service larger customers through relationships and partnerships with other businesses. While clustered companies may be competitive individually, they can cooperate together to address collective issues—such as skills shortages and productivity or a lack of key infrastructure - that threaten the competitiveness of an entire business sector that cannot be adequately addressed by an individual business operator.

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Clusters also foster innovation. The competition that occurs within clusters provides additional incentives to try new technologies and business practices, while their collaborative aspect facilitates the exchange of ideas. Through relationships and face-to-face contact between businesses, suppliers and service providers can help each other to highlight opportunities to introduce innovative products, processes or practices. The proximity of suppliers and other partners can help innovators source new materials or equipment more quickly, and makes it easier to get input from a broader range of partners.

Establishment of a business cluster within the Greenstone region will not only position local businesses to be efficient suppliers to local projects, but also ensure that they can be competitive in becoming suppliers to other development projects within Northwestern Ontario.

**Table 8: Industrial Parks Available**

Industrial Parks Available							
Park Name	Size	Price (\$/acre)		Rail Access	Serviced	Ownership	Owner Will Subdivide
Greenstone Regional Airport Commercial/Industrial Park	8 lots available (100X200ft)	\$0.38 /sq ft - airside	\$0.10 /sq ft - non airside	No	Yes	Public	Yes
R. Elmer Ruddick Nakina Airport Commercial/Industrial Park	Lots available (100X200ft) in 2013	\$0.38 /sq ft - airside	\$0.10 /sq ft - non airside	No	Yes	Public	Yes
Longlac Industrial Park	379 hectares (936.5 acres) of commercial						

Source: Greenstone Community Profile 2015. February 2015

Promoting innovation and a collaborative service sector for Greenstone will improve the ability of local businesses to become successful suppliers to the mining industry. Sales opportunities domestically and regionally would be maximized by developing a comprehensive catalogue of member suppliers/products and services, creating a comprehensive interface for mining and related clients. Members would be encouraged to develop product and service enhancements through continual research and development.

### 6.3 OPPORTUNITIES FOR PARTNERING WITH FIRST NATIONS

There are a number of opportunities for First Nation communities and businesses as a result of the indirect and induced impacts on the supply chain. These opportunities will provide significant economic development for the First Nations communities and businesses. First Nation partnership would be most effective through collaboration with each First Nations' respective Economic Development Corporation:

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- AZA Economic Development Department
- Papasay Management Corporation
- BZA Economic Development Department
- Aroland Economic Development Corporation
- Long Lake #58 First Nation Economic Development Corporation
- Rocky Shore Development Corporation

Partnerships between First Nations entrepreneurs or start-up companies with supplier companies when tendering – this not only presents opportunities for First Nations, but for suppliers -- also encourages using local services.

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## 7 OBSERVATIONS, RECOMMENDATIONS AND NEXT STEPS

### 7.1 OBSERVATIONS

From the background data that has been collected for this study and the analysis conducted, there are several important observations that GEDC may be able to build on in subsequent studies:

1. There is a comprehensive inventory of businesses and business capacity already in place which is invaluable to economic planners, economic development specialists and project developers who are working towards maximizing local employment and contracting. It is important that this database is kept up-to-date and made available to all interested parties.
2. With approximately 25% of Greenstone residents having a GED certificate (Grade 12 completion) and close to 45% having an advanced certificate, diploma or degree, Greenstone's population is in a strong position to take advantage of new employment opportunities, and entrepreneurial opportunities (The Municipality of Greenstone's Corporate Strategic Plan, 2013; and Greenstone Economic Development Strategy, 2012). This is underscored by a 69% participation rate in employment, suggesting there is room for job creation. With an average income near \$100,000 per annum, the people that do participate in the local economy tend to be skilled and tend to do well financially.
3. The Greenstone Regional Skills Centre provides an excellent facility for advancing skill sets that match the predicted employment opportunities in future.
4. The Municipality of Greenstone Corporate Strategy 2013-2018 and the Greenstone Economic Development Strategy 2012, provide strong focus for economic growth. However, the focus of both reports was development of the Black Thor chromite deposit in the Ring of Fire area. The Ring of Fire experienced investment set-backs following completion of the Greenstone Economic Development Strategy in 2012, necessitating the need to re-focus economic strategies on other more short-term opportunities such as the proposed Greenstone Gold Project, the proposed TransCanada Pipelines Energy East Pipeline and the proposed Northland Energy natural gas-fired electricity generation facility.
5. Alignment and timing of the access road/rail into the Ring of Fire mineralized zone and remote First Nations, will have significant long-term implications for local and regional economic growth potential. For this study, we have not addressed this aspect specifically, but instead have included the Ring of Fire as a general long-term contributor to the local and regional economy with some penalties (scale reduction) to represent the many uncertainties. Should an access road become fast-tracked, and should it interconnect to the provincial highway system through Greenstone, this will obviously have important implications for economic growth.
6. First Nations communities in the Greenstone Region are also exploring economic development opportunities and strategic partnership arrangements. The time is ripe for collaboration between all levels of government and business, in particular the aboriginal and non-aboriginal communities and business entities. Partnering adds strength and size to any entity that is looking to increase the breadth of their bidding, financing and project

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execution capability. It can also add cultural diversity, which is becoming an important objective for many project developers.

## 7.2 RECOMMENDATIONS

The style of this report does not lend itself well to recommendations as the primary focus of the study has been on development of the adaptive economic growth forecasting tool. However, following many of the observations noted above, there are some key high level recommendations for GEDC which could assist them in the advancement of their economic development strategy.

### *Recommendation 1*

It is recommended that GEDC use the adaptive tool in a “conservative” manner; always under-representing the potential scale of growth. This will help to ensure that expectations remain manageable and that economic development planning, and other programs are designed accordingly.

### *Recommendation 2*

It is recommended that GEDC continue to develop tools and frameworks which facilitate collaboration and partnering between parties. This could include provision of templates for basic partnership agreements, subcontractor agreements, etc. as well as directories of those companies that are seeking partners, and links to experts such as tax specialists, legal counsellors, etc., that are knowledgeable of corporate partnering structures and available to provide advice.

### *Recommendation 3*

It is recommended that GEDC continue to advance their relationship with local First Nations Economic Development Officers, with the objective of exploring opportunities for cooperation and partnership, and a focus on facilitating partnering arrangements between aboriginal and non-aboriginal business entities.

### *Recommendation 4*

It is recommended that GEDC establish and guide informal business clusters with the objective of strengthening relationships between entities within all aspects of the supply chain. These clusters could convene on a regular basis to remain vigilant and share information regarding upcoming business opportunities; to examine strengths and weaknesses of local suppliers; and most importantly to strategize ways that local business could be better aligned to maximize their chances of obtaining contracts. These clusters could also maintain inventories of companies from outside the region that have expressed interest in working with, and partnering with local companies.

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### Recommendation 5

It is recommended that GEDC continue to develop their inventory of local skills and talent by maintaining the local businesses inventory; sharing this inventory with neighbouring municipalities, First Nations and project developers; and working with other agencies in the municipality as well as provincial and federal agencies to develop/advance an individual skills based inventory with the objective of increasing exposure of local job candidates to prospective employers. The individual skills based inventory could also be used to identify training needs and to develop a collaborative training strategy, for the purposes of maximizing access to provincial and federal funding as well as corporate training programs. It is recommended that GEDC collaborates with the North Superior Workforce Planning Board (NSWPB) with respect to training needs and placement.

### Recommendation 6

It is recommended that GEDC periodically contribute information and updates to the Municipality of Greenstone and other interested parties, that reflects changing trends in employment and contractual preparedness that arise from successive iterations of the adaptive economic forecasting tool developed for this Study. This will help to ensure that all parties are continually adjusting their focus to the economic activities with the greatest chance of providing employment, contract opportunities and general economic growth.

## 7.3 NEXT STEPS

It is suggested that the GEDC conduct the following specific tasks as follow-up to receiving this report, consistent with the recommendations outlined above:

1. Present the results of this Study, in particular the adaptive economic forecasting tool, to the Municipality of Greenstone and its member communities, local/regional First Nations, and other interested parties.
2. Set-up a schedule of activities and meetings necessary to establish the supply chain industry clusters.
3. Over the course of 2016, develop a library of templates and frameworks for partnering agreements, expert advisors, etc., that can be accessed by local business operators interested in partnering with other business entities.
4. Continue to update and maintain the local business directory. The more detail that is provided in this directory, the more valuable it will be to business entities from outside the region that are looking to add local talent to their team(s).
5. Continue to develop or establish a matrix of individual skills that includes education attainment, area of expertise and years of experience. It would be ideal if this database could also be used to highlight individuals of Anishnawbe and Métis decent.
6. Work with the Municipality of Greenstone to update their Corporate Strategy which is currently focussed in Ring of Fire development, providing guidance on the potential of other shorter-term and more realistic economic activities.

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## APPENDIX A

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### Economic Development Model – Methodology, Assumptions and Instructions

## APPENDIX A

### 1 ASSUMPTIONS

Economic activity resulting from mine development was calculated using the Input-Output data system and models maintained by Statistics Canada, as presented by Dungan and Murphy in their critically acclaimed studies, “Mining: Dynamic and Dependable for Ontario’s Future” and “An Authentic Opportunity: The Economic Impacts of a New Gold Mine in Ontario” prepared for the Ontario Mining Association in December 2012 and October 2014 respectively.

A similar approach was used to quantify GDP growth as a result of other construction projects. The report “The Economic Benefits of TransCanada’s Canadian Mainline Conversion Project” presented by Deloitte Canada in August, 2013, provided the basis for the quantification of sector specific growth as a result of the other prospective development projects.

The following criteria were followed to develop the projections:

Each project was given the following basic information:

- **Construction Probability** – An estimate of the likelihood that a prospective development project would go into construction;
- **Greenstone Retention** – An estimate of the percentage of economic activity generated by a development project will likely be able to be retained within the Municipality of Greenstone;
- **Start Date;**
- **End Date;**
- **Capex** – Total Capital Expenditures required for a project;
- **Construction Duration** – Number of years required to complete project construction;
- **Preconstruction Timeframe** – Number of years Capex is spent before construction begins;
- **Percentage of Capex spent during PreConstruction** – It was assumed that this percentage of capex spent is equally distributed throughout the preconstruction time period;
- **Percentage of Capex spent during Construction** – It was assumed that this percentage of capex spent is equally distributed throughout the construction time period;
- **Type of Project** – Three types of project types are included in this analysis:
  - Mine – Uses Dungan and Murphy report (2014) to derive estimates for GDP and Employment Growth;
  - Pipeline – Uses Deloitte Canada (2013) report to derive estimates for GDP and Employment Growth; and
  - Power – Uses both the Dungan and Murphy, and Deloitte Canada reports to estimate GDP and Employment Growth.

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- **Opex** – Annual Operating expenditures.

## 2 INSTRUCTIONS

This model consists of 10 connected spreadsheets which allows the User to modify key information sources to investigate different scenarios.

Within the worksheet “Summary Sheet – Scenarios”, each of the inputs on the main table can be adjusted as better data becomes available. These inputs are:

- Construction Probability;
- Greenstone Retention;
- Start Date;
- End Date;
- Capex;
- Construction Duration; and
- Opex.

This main table is illustrated below

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Project	SCENARIOS												PROJECT INFORMATION				
	Scenario 1			Scenario 2			Scenario 3			Scenario 4							
		Construction Probability (%)	Greenstone Retention		Construction Probability (%)	Greenstone Retention		Construction Probability (%)	Greenstone Retention		Construction Probability (%)	Greenstone Retention	Start Date	End Date	Construction Duration (years)	Capex (\$M)	Opex/year (\$M)
GREENSTONE GOLD PROJECT	Y	85%	50%	Y	85%	25%	Y	85%	50%	Y	85%	75%	2017	2030	3	410	35
ENERGY EAST PIPELINE	Y	35%	10%	Y	35%	25%	Y	35%	50%	Y	35%	75%	2017	2040	2	100	0
NORTHLAND POWER 300MV PROJECT	Y	35%	10%	Y	35%	25%	Y	35%	50%	Y	35%	75%	2020	2050	2	300	30
BLACK THOR CHROMITE	N	40%	0%	Y	40%	10%	Y	40%	10%	Y	40%	10%	2025	2053	4	1450	900
NORONT RESOURCES EAGLES NEST	N	40%	0%	Y	40%	10%	Y	40%	10%	Y	40%	10%	2018	2028	3	610	97
BROOKBANK GOLD PROJECT	N	85%	50%	Y	85%	25%	Y	85%	50%	Y	85%	75%	2018	2028	3	163	24
TRANSMISSION LINE UPGRADES	Y	35%	10%	Y	35%	10%	Y	35%	10%	Y	35%	10%	2020	2050	2	650	5
PROJECT 1	N			N			N			N							
PROJECT 2	N			N			N			N							

First Year in Model	2016
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Each development project is represented by its own tab. In this tab, the inputs that can be adjusted are:

- Type of Project;
- % of CAPEX spent in Preconstruction;
- % of CAPEX spent in Construction; and
- Pre-construction time frame (years).

These options are illustrated below:

Pre-construction time frame (years)	6
% of CAPEX spent in Preconstruction	0.1
% of CAPEX spent in Construction	0.75

TYPE OF PROJECT	Mine
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## APPENDIX B

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### Economic Development Model – Results

GREENSTONE ECONOMIC PROJECTIONS (2016-2036)

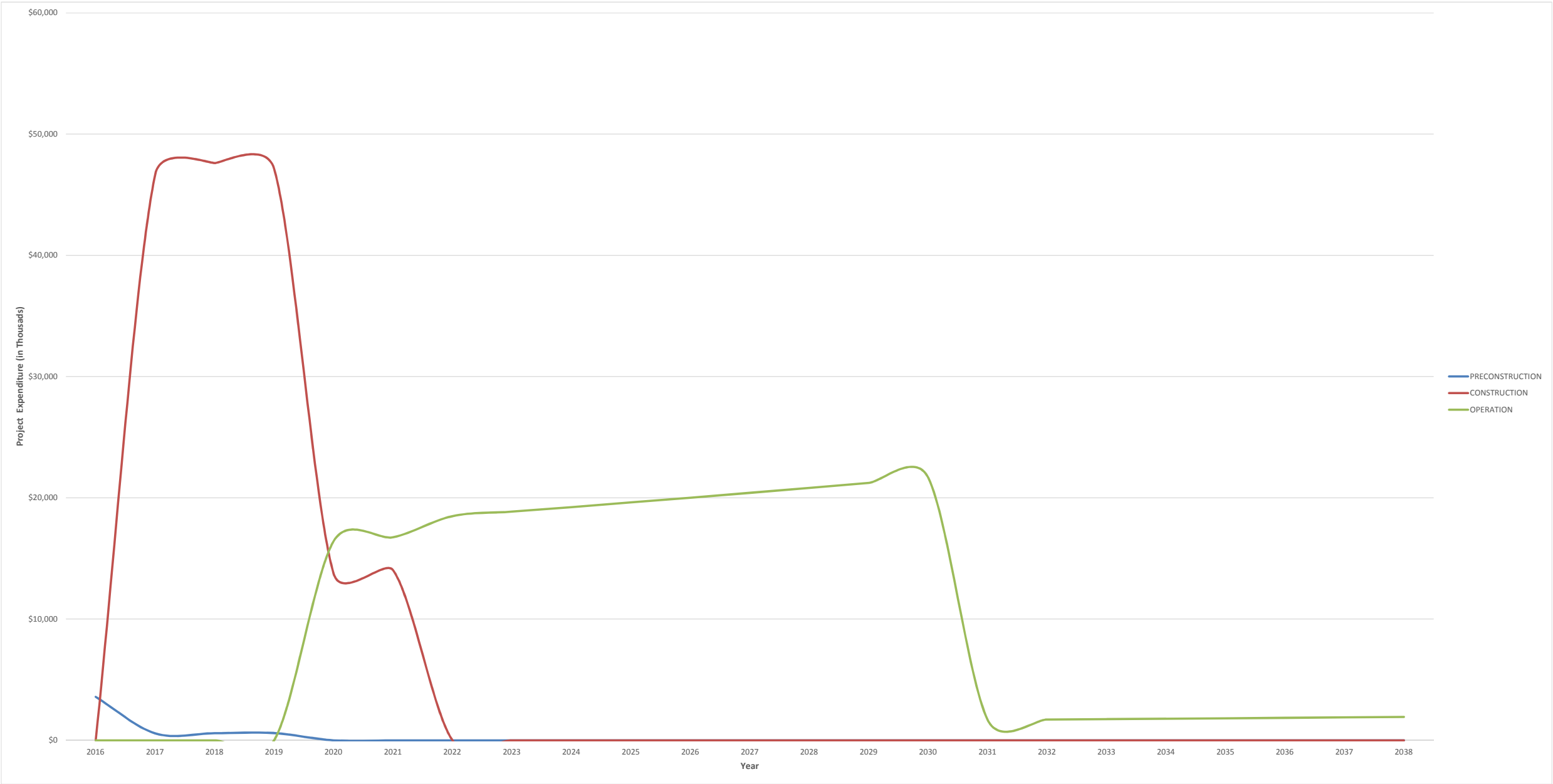
PROJECT DESCRIPTIONS

Project	SCENARIOS												PROJECT INFORMATION				
	Scenario 1			Scenario 2			Scenario 3			Scenario 4							
		Construction Probability (%)	Greenstone Retention		Construction Probability (%)	Greenstone Retention		Construction Probability (%)	Greenstone Retention		Construction Probability (%)	Greenstone Retention	Start Date	End Date	Construction Duration (years)	Capex (\$M)	Opex/year (\$M)
GREENSTONE GOLD PROJECT	Y	85%	50%	Y	85%	25%	Y	85%	50%	Y	85%	75%	2017	2030	3	410	35
ENERGY EAST PIPELINE	Y	35%	10%	Y	35%	25%	Y	35%	50%	Y	35%	75%	2017	2040	2	100	0
NORTHLAND POWER 300MV PROJECT	Y	35%	10%	Y	35%	25%	Y	35%	50%	Y	35%	75%	2020	2050	2	300	30
BLACK THOR CHROMITE	N	40%	0%	Y	40%	10%	Y	40%	10%	Y	40%	10%	2025	2053	4	1450	900
NORONT RESOURCES EAGLES NEST	N	40%	0%	Y	40%	10%	Y	40%	10%	Y	40%	10%	2018	2028	3	610	97
BROOKBANK GOLD PROJECT	N	85%	50%	Y	85%	25%	Y	85%	50%	Y	85%	75%	2018	2028	3	163	24
TRANSMISSION LINE UPGRADES	Y	35%	10%	Y	35%	10%	Y	35%	10%	Y	35%	10%	2020	2050	2	650	5
PROJECT 1	N			N			N			N							
PROJECT 2	N			N			N			N							

First Year in Model	2016
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GREENSTONE ECONOMIC PROJECTIONS (2016-2036)

SCENARIO 1 - GREENSTONE GOLD PROJECT ENERGY EAST PIPELINE NORTHLAND POWER 300MV PROJECT TRANSMISSION LINE UPGRADES																								
Project Expenditure Summary (2015 dollars)																								
Expenditures																								
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
	PRECONSTRUCTION	3,587	577	588	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CONSTRUCTION	0	46,688	47,622	47,153	13,767	14,042	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OPERATION	0	0	0	0	16,423	16,752	18,494	18,864	19,241	19,626	20,018	20,419	20,827	21,244	21,668	1,682	1,715	1,750	1,785	1,820	1,857	1,894	1,932
	TOTAL	3,587	47,265	48,210	47,753	30,190	30,794	18,494	18,864	19,241	19,626	20,018	20,419	20,827	21,244	21,668	1,682	1,715	1,750	1,785	1,820	1,857	1,894	1,932



## GREENSTONE ECONOMIC PROJECTIONS (2016-2036)

Project Expenditure Summary (2015 dollars)																									
GDP impact (in Thousands)																									
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
	Crop and animal production	4	52	53	54	37	37	35	36	37	37	38	39	40	40	41	3	3	3	3	3	3	3	3	
	Crop and animal production (jobs)	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	Forestry and logging	1	14	14	14	5	5	4	4	4	5	5	5	5	5	5	0	0	0	0	0	0	0	0	
	Forestry and logging (jobs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Fishing, hunting and trapping	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Fishing, hunting and trapping (jobs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Support activities for agriculture and forestry	0	5	5	5	3	3	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0
	Support activities for agriculture and forestry (jobs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mining, quarrying, and oil and gas extraction	64	697	711	654	13,167	13,430	14,076	14,358	14,645	14,938	15,237	15,542	15,852	16,169	16,493	1,109	1,131	1,154	1,177	1,201	1,225	1,249	1,274	
	Mining, quarrying, and oil and gas extraction (jobs)	0	4	4	4	83	84	88	90	92	94	96	98	100	102	104	7	7	7	7	8	8	8	8	8
	Utilities	28	410	418	426	1,943	1,982	2,120	2,163	2,206	2,250	2,295	2,341	2,388	2,435	2,484	167	170	174	177	181	184	188	192	
	Utilities (jobs)	0	1	1	2	7	7	8	8	8	8	8	8	8	8	9	9	1	1	1	1	1	1	1	1
	Non-residential building construction	361	5,225	5,330	5,436	515	525	18	18	18	19	19	19	19	20	20	21	1	1	1	1	2	2	2	2
	Non-residential building construction (jobs)	5	66	67	68	6	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Engineering construction	643	7,768	7,923	7,613	4,603	4,695	900	918	937	955	974	994	1,014	1,034	1,055	71	72	74	75	77	78	80	81	
	Engineering construction (jobs)	6	78	79	76	46	47	9	9	9	10	10	10	10	10	11	1	1	1	1	1	1	1	1	1
	Repair construction	21	261	266	257	738	752	699	713	727	742	756	772	787	803	819	64	65	67	68	69	71	72	74	
	Repair construction (jobs)	0	4	4	4	10	11	10	10	10	11	11	11	11	11	12	1	1	1	1	1	1	1	1	1
	Other activities of the construction industry	3	47	48	49	18	19	15	16	16	16	17	17	17	18	18	1	1	1	1	1	1	1	1	1
	Other activities of the construction industry (jobs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Manufacturing	284	4,066	4,148	4,216	1,709	1,743	1,368	1,395	1,423	1,452	1,481	1,510	1,540	1,571	1,603	108	110	112	114	117	119	121	124	
	Manufacturing (jobs)	3	41	42	43	17	18	14	14	15	15	15	15	15	16	16	16	1	1	1	1	1	1	1	1
	Wholesale trade	290	3,960	4,039	4,049	1,886	1,924	1,170	1,194	1,218	1,242	1,267	1,292	1,318	1,345	1,371	99	101	103	105	107	109	111	114	
	Wholesale trade (jobs)	2	32	33	33	15	16	10	10	10	10	10	11	11	11	11	1	1	1	1	1	1	1	1	1
	Retail trade	81	1,124	1,147	1,155	742	757	608	620	633	645	658	671	685	699	713	52	53	55	56	57	58	59	60	
	Retail trade (jobs)	2	26	27	27	17	18	14	15	15	15	15	16	16	16	17	1	1	1	1	1	1	1	1	1
	Transportation and warehousing	61	784	800	787	731	746	527	537	548	559	570	582	593	605	617	44	45	46	46	47	48	49	50	
	Transportation and warehousing (jobs)	1	10	10	10	9	10	7	7	7	7	7	7	7	8	8	8	1	1	1	1	1	1	1	1
	Information and cultural industries	41	595	607	619	396	404	378	386	394	401	409	418	426	434	443	30	30	31	32	32	33	34	34	
	Information and cultural industries (jobs)	0	4	4	4	3	3	2	2	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0
Finance, insurance, real estate, rental and leasing and holding companies	213	2,999	3,059	3,091	1,779	1,815	1,463	1,492	1,522	1,552	1,583	1,615	1,647	1,680	1,714	122	124	127	129	132	135	137	140		
Finance, insurance, real estate, rental and leasing and holding companies (jobs)	1	18	19	19	11	11	9	9	9	9	10	10	10	10	10	1	1	1	1	1	1	1	1	1	
Owner Occupied Dwellings	116	1,634	1,666	1,685	1,126	1,149	982	1,001	1,021	1,042	1,062	1,084	1,105	1,127	1,150	82	83	85	87	89	90	92	94		
Owner Occupied Dwellings (jobs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

GREENSTONE ECONOMIC PROJECTIONS (2016-2036)

Project Expenditure Summary (2015 dollars)																									
GDP impact (in Thousands)																									
	Professional, scientific and technical services	231	2,733	2,787	2,658	2,164	2,207	786	802	818	834	851	868	885	903	921	69	70	71	73	74	76	77	79	
	Professional, scientific and technical services (jobs)	3	31	31	30	24	25	9	9	9	9	10	10	10	10	10	1	1	1	1	1	1	1	1	
	Administrative and support, waste management and remediation services	44	587	599	596	386	394	265	270	275	281	286	292	298	304	310	21	21	22	22	23	23	23	24	
	Administrative and support, waste management and remediation services (jobs)	1	12	12	12	8	8	5	6	6	6	6	6	6	6	6	0	0	0	0	0	0	0	0	
	Educational services	2	26	27	27	14	15	15	15	16	16	16	17	17	17	18	3	4	4	4	4	4	4	4	
	Educational services (jobs)	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	Health care and social assistance	17	245	250	255	167	170	162	165	168	171	175	178	182	186	189	15	15	16	16	16	17	17	17	
	Health care and social assistance (jobs)	0	5	5	5	3	3	3	3	3	3	3	3	3	3	4	0	0	0	0	0	0	0	0	
	Arts, entertainment and recreation	8	115	117	119	76	77	72	73	75	76	78	80	81	83	84	6	6	6	6	6	6	6	6	7
	Arts, entertainment and recreation (jobs)	0	3	3	3	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	
	Accommodation and food services	36	333	340	289	545	556	170	173	176	180	184	187	191	195	199	25	25	26	26	27	27	28	28	
	Accommodation and food services (jobs)	1	11	12	10	19	19	6	6	6	6	6	6	6	7	7	1	1	1	1	1	1	1	1	
	Other services (except public administration)	20	283	288	294	155	159	143	146	149	152	155	158	161	164	168	11	12	12	12	12	12	13	13	
	Other services (except public administration) (jobs)	1	7	8	8	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	
	Non-profit institutions serving households	5	79	80	82	50	51	47	48	49	50	51	52	53	54	55	4	4	4	4	4	4	4	4	
	Non-profit institutions serving households (jobs)	0	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	Government education services	11	154	157	161	103	105	99	100	103	105	107	109	111	113	115	8	8	8	8	8	9	9	9	
	Government education services (jobs)	0	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	Government health services	3	44	45	46	29	29	27	28	28	29	30	30	31	31	32	2	2	2	2	2	2	2	2	
	Government health services (jobs)	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Other federal government services	4	56	57	58	48	49	47	48	49	50	51	52	53	54	55	4	4	4	4	4	4	4	4	
	Other federal government services (jobs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Other provincial and territorial government services	1	18	18	19	23	24	24	25	25	26	26	27	27	28	28	2	2	2	2	2	2	2	2	
	Other provincial and territorial government services (jobs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Other local government services	149	706	720	294	3,015	3,075	88	90	92	94	96	98	99	101	103	7	7	7	7	8	8	8	8	
	Other local government services (jobs)	2	7	7	3	31	31	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	Crude oil and other pipeline transportation	0	0	0	0	0	0	20	21	21	21	22	22	23	23	24	24	25	25	25	26	27	27	28	
	Crude oil and other pipeline transportation (jobs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Electric power generation, transmission and distribution	0	0	0	0	0	0	96	98	100	102	104	107	109	111	113	115	118	120	122	125	127	130	132	
	Electric power generation, transmission and distribution (jobs)	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Other	0	0	0	0	23,577	24,048	26,317	26,843	27,380	27,928	28,486	29,056	29,637	30,230	30,835	2,137	2,179	2,223	2,267	2,313	2,359	2,406	2,454	
	Other (jobs)	0	0	0	0	241	246	269	275	280	286	292	298	303	310	316	22	22	23	23	24	24	25	25	







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