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An Au-thentic Opportunity:

The Economic Impacts of a New Gold Mine in Ontario

by

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The Economic Impacts of a New Gold Mine in Ontario

Executive Summary

Opportunities for gold mining in Northern Ontario have risen remarkably in recent years, with new mines underway and the potential for several more in varying stages of the review process. All stakeholders – including miners, Aboriginal and other local communities, governments and supplier industries - will benefit from an assessment of the economic impact of new gold mines for proper planning. To help meet this need the Ontario Mining Association has commissioned the present study.

Building on the techniques employed in 2007 to examine the impact of a 'representative' Ontario nickel and copper mine, we estimate, using conservative assumptions, the impact on GDP, employment and government revenues of both the construction and the ongoing operation of a new gold mine in a relatively remote region of Northern Ontario. The impacts are for the Ontario economy as a whole and, more generally, for the region in which the project is sited. Impacts are also shown for Canada and selected other provinces.

Most gold mining in Northern Ontario up to this point has been 'underground', but a number of newer projects - operating and proposed - use 'open pit' techniques. The choice between the two is determined by the geology of the ore body and mineral economics, but given that both types of mines will likely be developed, this study examines the impacts of each.

We consider a new open pit gold mine with a construction cost of $750 million spread over three years (after and excluding all exploration, planning, permitting and other pre-construction expenditures). The mine then generates sales of $300 million per year, potentially for over 20 years into the future and employs 440 persons on site with total compensation of $142,200 per worker. The combined direct, indirect and induced economic impacts of an open pit gold mine are extremely large. In its construction phase the mine adds about $183 million to Ontario GDP and generates over 1,900 jobs annually. In its production phase, for each year of operation, the mine adds approximately $300 million to Ontario GDP and increases Ontario's employment by over 1,800 at a rate of compensation per employee well above the provincial average.

The combined impact on government revenues of a new open pit gold mine is also large: In the construction phase governments collect a total of $60 million a year from the mine's direct, indirect and induced activity, while in the production phase this rises to $95 million per year. The provincial government's share is $25 million in the construction phase, and over $38 million in the production phase.

We also consider a new underground gold mine with a construction cost of $600 million also spread over three years. This mine also generates $300 million in sales per year over an extended period with on-site employment of 620 and total compensation per worker of $145,500. The combined direct, indirect and induced impacts of an underground mine are also very large. In the construction phase the mine adds almost $150 million to Ontario GDP and generates over 1,500 jobs in each of the three years. In production, the

mine contributes over $330 million per year to Ontario GDP and generates 2,200 additional jobs annually, again with a very high average rate of labour compensation.

In the construction phase of a new underground gold mine, governments collect just under $50 million a year from the direct, indirect and induced impacts, with the provincial government receiving $20 million. In the production phase, all governments receive over $100 million per year, with over $40 million going to the provincial government.

Just as a typical mine, whether open pit or underground, has multiple layers of activity, our analysis of a new mine's impact extends down to several layers below the economic activity at the mine site itself. The first level down is what we could characterize as the indirect impacts of the mine: These are the purchases that the mine must make in order to be built and to undertake its production (its 'inputs'), and also the purchases that the industries producing these inputs must make to facilitate their own production ('inputs into inputs'), and so on back along the production chain.

Included in these indirect impacts are the provision of transportation facilities to the mine, the purchase of a wide range of accounting, financial and scientific services, and the replacement of machinery and equipment that wears out at the mine in the course of production. Also included are all the inputs required to produce the mine's purchased inputs – for example, the replacement parts that are needed to maintain the machinery at the mine and the steel that goes into those parts and the energy and transportation services needed to produce the steel. This 'backward chain' of inputs into inputs is quite extensive.

The second level down can be termed the induced economic impacts. These are the economic impacts that result from the spending of wages and salaries by workers employed both directly by the mine and indirectly in all of the supplier industries. To the extent that these consumer goods and services are produced in Ontario, there is a further economic impact on the province. Moreover, this level has a backward input chain to it as well, since consumer goods, or services, require their own inputs which may also be produced in Ontario and generate further wage earnings.

The third level down is to consider the regional impacts of a new gold mine where 'regional' for a mine in a relatively remote site must be considered as a broad enough area to include the nearest major town or city, as well as all the smaller communities within roughly the same distance. Obviously, the mine's own building or production activity is local, but so also will be at least some of the indirect and induced impacts identified at the first and second levels. We find that a significant share of the impacts of a new gold mine stay in the local area. For example, for an open pit gold mine in production, over 1,350 of the total of 1,800 jobs generated are local. For an underground mine, almost 1,700 of the 2,200 jobs generated are in the broad local area.

Given that the mine is assumed to be located in a relatively remote area of Ontario, the local impacts can be seen to some extent as a proxy for opportunities for Aboriginal individuals and businesses in the broadly surrounding area. We have attempted in this study to identify the skill mix for the jobs that have been identified as local. Some of these jobs will require considerable expertise and such individuals will likely come from outside the local area, although part of their spending will encourage local activity. But

an important share of the local jobs require less-specialized preparation or training that can be learned on the job.

For example, in the production phase of a new open pit mine, of the over 1,350 local jobs, 25% require only Secondary School or Specific Occupation Training, and a further 12% require only On-the-Job training. Moreover, gold mines underway and planned are already attempting to outsource services to local entrepreneurs and to nurture new local supply and service enterprises.

At the fourth level down there are important but unquantifiable economic and social impacts that originate from the new mine. Most notable among these are the economic activity associated with maintaining the local community: Local government workers, teachers, police, fire and health care. Beyond the employment impacts, and the encouragement of local entrepreneurship, there will also be direct monetary benefits to Aboriginal communities through Impact Benefit Agreements (IBAs). Such agreements, however, can vary widely, are subject to intense negotiations and historically have tended to be confidential (although changes to federal legislation are expected to make them more transparent in the future). We have not attempted to quantify the monetary flows resulting from them, but they will certainly occur and flow through to Aboriginal communities, which would add to the 'induced' effects we calculate purely from the respending of labour income.

Finally, there are the intangible benefits of the provision of key infrastructure, such as access roads and electrical grid connections, that are part of the costs of constructing either open-pit or underground mines in remote locations. As with transferable skills, these remain behind to benefit individuals and the remote community even when the mine eventually closes down.

Briefly then, the contribution of a new gold mine to the province is large and significant, with important impacts on employment and economic output, particularly in areas of the province that could benefit the most from them.

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The Economic Impacts of a New Gold Mine in Ontario

Over the last twenty years, we have demonstrated in a number of reports the importance of the mining industry to both the Ontario and Canadian economies. Our most recent report, *Mining: Dynamic and Dependable for Ontario's Future*, published in December 2012, highlights the crucial contribution that the Ontario mining industry currently makes to the Ontario economy and its anticipated future importance to the province.

However, as we discussed in our December 2007 study *Ontario Mining: A Partner in Prosperity Building - The Economic Impacts of a 'Representative' Mine in Ontario*, policy decisions do not usually revolve around the existence of an entire industry. Instead, it is the opening of a new mine, or policy action needed to maintain the production of an existing individual mine, that is usually the focus of decision-making. Should a government – federal, provincial or local – take positive steps to preserve an existing mine, or facilitate the opening of a new mine, or should it adopt attitudes of neutrality, or even consider policies that might discourage a particular mine project? These questions are the kind that typically concern mining companies, communities and governments more than the widely-recognized value of the entire industry.

All stakeholders – including miners, Aboriginal and other local communities, governments and supplier industries - will therefore benefit from an assessment of the economic impact of new gold mines for proper planning. To help meet this need the Ontario Mining Association has commissioned the present study. The study would once again characterize the annual contribution of a mine's construction and production to Ontario Gross Domestic Product (GDP), employment, earnings and government revenues in order to give a better idea of the importance to the economy of policies that might support, or hinder, a particular mine.

With the increased value and relative importance of gold mining production in the province in recent years, as well as the number of announced projects currently in the pipeline, it was decided that the impact of a gold mine would be the subject of our

analysis. In our previous analysis, it made sense to examine the impact of a nickel-copper mine in a serviced area of the province such as Sudbury. Gold mines, however, often tend to be in relatively remote under-serviced areas. This impacts not only the types of investments needed to be made in order to make a new mine viable (including building new roads and a new power line to the nearest electrical substation) but also the likelihood that the mine will be built in an area of the province where there is a significant Aboriginal presence. This means that we need to recognize the scope for the possible benefits that can be realized by Aboriginal groups. While Impact Benefit Agreements (IBA) will almost certainly be signed for all new gold mines in Ontario in the future, the individual and confidential nature of these agreements make it difficult for us to estimate the explicit dollar value of them.

We therefore will concentrate on the size and nature of the benefits emanating from the building and operating of a new gold mine. Using information from the Mining Industry Human Resources Council (MiHR) and the National Occupational Classification (NOC) system of Human Resources and Skills Development Canada, we attempt to capture the skill mix required to perform the jobs ensuing from the creation of a new gold mine. Given the difficult nature of trying to measure the skills, or training, required in jobs across all of the sectors that are inputs into the new gold mine, as well as those that results from the induced impacts, the results should be viewed as reasonable estimates. However, we feel that these estimates can provide an important input for all parties to utilize in understanding the type of training required for local Aboriginals to take advantage of the opportunities offered by the new mine.

The study attempts to measure the economic contribution of a new gold mine to the Ontario economy, both in its building phase - the period in which the new mine would be constructed and put into production - and in its ongoing production phase (a period that might last as long as 10 to 20 plus years). Once the details of a new gold mine have been sketched out, the study determines the economic impact on output, employment and earnings, and also on tax revenues of the various levels of government, on an annualized basis. The study also attempts, although here it must be more cautious, to isolate what might be called the local impacts within a region of Ontario surrounding the new mine.

One further wrinkle came in sketching out the details of the new gold mine. While in our 2007 study of a 'representative' nickel-copper mine, it was fairly straightforward to determine the nature and size of the mine for analysis, this was certainly not the case for the new gold mine. It quickly became apparent that the size of mines currently in production, as well as those that have been proposed to be opened, range from tens of millions of dollars in investment to more than $1.5 billion. Determining a 'representative' size of mine has been difficult. As well, up until recently virtually all significant gold mining in the province has been via underground mining (the sinking of shafts, etc.).

However, with the rapid increase in the price of gold over the last decade, as well as changes in geological detection and technology, previously economically unviable mineral deposits can now be profitably accessed via open pit mining. It is not unreasonable to expect that both types of gold mines may be opened in the future, depending on the nature of the gold find. The two types of mines have different types of investment associated their construction and opening (open pit mines tend to have a bigger mill and more heavy trucks/equipment) and spending patterns on operations (underground mines tend to spend a higher share of their operating budget on labour). We, therefore, have attempted to measure the impacts of the construction and annual operations of each type of mine.[1]

Both the open pit and underground gold mines are meant to be 'representative', and as such, do not reflect any company's existing or announced future operations. The ultimate choice between open-pit or underground gold mining will be determined by geology. While our results show that the economic, employment and tax benefits of the two types of mines do differ, although not drastically, they also show that for both types they are large and would be important to the remote communities near which they would be sited. The impacts from these 'representative' mines are expected to be largely 'scalable', meaning that if twice as much were spent to construct the new mine then the impacts

[1] It is, of course, possible that because of the geology of the mine it could start as an open pit mine that evolves into an underground one. There are a number of such mines currently being contemplated in Ontario. We have not examined this option explicitly, but it would fall within the range of the two types of mines studied here.

would be roughly twice as big. The same would be true for the operations of the new mine.

As we found in our last study, it quickly becomes apparent that the economic impacts of a mine are in many ways like the nature of an underground mine itself: That is, the bulk of the activity is hidden below the ground and not readily visible at first glance. The direct economic impact of a mine is, in a sense, what one sees on the surface. These are the sales of products by the mine itself, the number of people it directly employs, the wages and salaries and profits earned in the operation of the mine itself, and the taxes it pays. For the construction of the new mine, these would include the wages and salaries and supplementary labour income of all the construction workers on the mine site.

One layer below the surface of the ground is what we could characterize as the indirect impacts of the mine: These are the purchases that the mine must make in order to undertake its production (its 'inputs'), and also the purchases that the industries producing these inputs must make, in turn, to facilitate their production ('inputs into inputs'), and so on back along the production chain. Included in these indirect impacts are such things as the provision of transportation facilities to the mine, the purchase of a wide range of accounting, financial, insurance and scientific services, and the replacement of machinery and equipment that wears out at the mine in the course of production.

Also included are all the inputs required to produce the mine's purchased inputs – for example, the replacement parts that are needed to maintain the machinery at the mine, and the steel that goes into those parts, and the energy and transportation services needed to produce the steel. In many cases, this 'backward chain' of inputs into inputs into inputs can be quite extensive. Of course, in an open economy like Ontario's many indirect inputs are imported from other countries and generate no further impact on the Ontario economy.

However, we do keep track of indirect inputs imported into Ontario from other provinces and it turns out there are considerable impacts from an Ontario mine on the economic

activity of the rest of Canada. For the construction of the mine, the indirect impacts, as well, are the impacts of the purchased inputs into the construction process, together with the purchased machinery and equipment, and the impacts on up the production chain.

On a second level, below the indirect impacts, comes what are commonly called the induced economic impacts. Briefly, these are the economic impacts that result from the spending of wages and salaries by workers employed both directly in the mine and indirectly in all of the supplier industries. To the extent that these consumer goods and services are produced in Ontario, there is a further economic impact on the province. Moreover, this level has a backward input chain to it as well, since consumer goods or services require their own inputs, which may also be produced in Ontario and generate further wage earnings. For the construction of the mine, this would include the spending of wages and salaries by construction workers employed both directly at the mine site and indirectly in all of the supplier industries.

Using information available from public reports from the Ontario Mining Association, various federal and provincial government departments and special calculations performed by Statistics Canada in its Input-Output Division, it is possible to obtain reliable calculations of the direct, indirect, and induced impacts of the construction and operation of a new mine in Ontario. To maintain reliability, cautious assumptions have been used where necessary in determining elements such as tax take at the various levels, or production and re-spending by consumers. In all cases, an attempt has been made to make the estimates presented in this report as reliable and conservative as possible.

We have also made an attempt to calculate what could be called a third level of impacts, within a region of Ontario surrounding the new mine. The input-output techniques and calculations that we have used to calculate the indirect and induced impacts of the new mine unfortunately are limited to a province-wide basis. However, using techniques as in our previous study we estimate how much of the economic activity spun off from the new mine actually stays within the region or community surrounding the mine. Because we are assuming that the new gold mine will be built in a relatively remote area of Northern

Ontario, we take a more 'regional' view of what local means than a mine built in the Sudbury area.

Given the cautious nature of the report, we have not been able to quantify much of what could be considered a final level to the economic impacts of a new gold mine. Effectively at this level, there is a whole host of additional economic impacts that we know exist, but which occur on an irregular basis or are difficult to quantify. Examples include: Consultations with local communities, the costs associated with permitting and approvals, the spending of pensions by retired miners, environmental protection and mine rehabilitation costs, and the construction of community recreation facilities and other key community infrastructure in towns or Aboriginal communities in the region of the mine. The report, however, will provide a detailed list of these additional economic and social impacts of a new gold mine. As discussed earlier, we will try to identify particular opportunities for Aboriginal peoples and businesses.

This report has three main sections. The first examines the economic impacts of a new open pit gold mine both in the building of the mine – a process that can take several years[2] - and when the mine is fully in production. The second examines the economic impacts of a new underground gold mine, again both in the building of the mine and when the mine is fully in production. The third concentrates on the potential benefits of these two types of gold mines for Aboriginal communities.

We begin with the impacts of the construction of a new open pit gold mine in Ontario.

I.1 A New Open Pit Gold Mine – Impacts of the Construction of the Mine

In this section, we examine the economic impacts of constructing and bringing into production a new open pit gold mine in Ontario. The construction of the mine is assumed

[2] What is meant here is the actual construction phase of the mine. The initial exploration, detailed planning, environmental studies and obtaining of permits can all take many years in advance of the actual construction.

to occur in a relatively remote area of Northern Ontario that does not already possess much of the necessary infrastructure for mining production. That is, to make the new mine viable, road and power network investments are necessary to tie into the existing infrastructure. As well, it is expected that facilities will be built so that production workers live on-site and a mill of sufficient capacity commensurate with the size and anticipated production level of the open pit mine will be constructed.

As described earlier, there are layers of impacts to the mine being constructed or 'opened'. Using data from the Ontario Mining Association, from the Input-Output Division at Statistics Canada, and a variety of other sources, we develop direct, indirect, induced and local economic impacts from the construction of a new open pit gold mine.

Construction of a New Open Pit Gold Mine – Surface Level

In consultation with the Ontario Mining Association and gold analysts, we have determined that the construction of a new open pit gold mine in a relatively remote area of the province would take about three years (see Table 1), with a total capital investment expenditure of $750 million, or $250 million per year. We assume that roughly 40% or $300 million of the total will be spent on the mill and another $80 million on connecting the new mine to existing infrastructure. As noted earlier, we are capturing the impact of the actual construction phase here. Several years at least will have had to have been spent in advance in exploration, analysis, environmental assessment and obtaining all necessary permits and local community involvement.

The direct impacts of the mine construction activity and the acquisition and putting in place of the mine machinery are considerable (see Table 2): Employment generated is 996 jobs per year, with total labour compensation of almost $66 million annually. The annual labour compensation per employee is about $66,000 – considerably above the provincial average rate of roughly $55,000 (although as we will see, less than in mining production) due to the skilled and intense nature of the construction activity. Ontario GDP is directly increased by $92 million annually.

Using information from the National Occupational Classification (NOC) system of Human Resources and Skills Development Canada, we attempt to capture the skill mix required to perform the jobs ensuing from the construction period of a new gold mine. Per the NOC, there are five 'skill levels' for each type of job in the economy represented by: (1) Management, (2) Level A – University Degree, (3) Level B - College or Apprenticeship Certification, (4) Secondary School and/or Specific Occupation Training, and (5) On-the-Job Training Usually Provided. For a brief description of and details on the NOC system see Appendix A.

Taking the annual job creation numbers generated in Table 2 and using the NOC measures of 'skills' required to perform jobs in the Ontario economy, we get a measure of the 'skill mix' for the direct job impacts from the construction of a new open pit gold mine (see Table 3). It is estimated that over half of the annual 996 jobs directly created by the construction of the open pit gold mine require the equivalent of College or Apprenticeship Accreditation (Skill Level B). Over 200 jobs (21%) need Secondary School or Specific Occupation Training (Level C) and over 90 jobs require only On-the-Job Training (Level D).

Indirect Impacts – First Level Down

The indirect impacts occur through providing inputs to the direct economic activity (when they are not imported) and of inputs to these inputs, and so on back up the production chain. For example, construction of the mine requires concrete that in turn requires quarried gravel and limestone and its transportation to the site. The machinery put in place in the mine, when sourced in Ontario, requires steel and other metallic inputs, transportation and fuel. Both construction and machinery activities require a wide range of business services. In Appendix B Tables B.1 and B.2, we show the diverse impacts across Ontario industries and indeed across Canada of the direct and indirect impacts. In Appendix C Table C.1, we reveal the direct and indirect impacts on international imports into Ontario and Canada of the mine construction, which reflects opportunities for Ontario and other Canadian businesses to supplant these foreign suppliers.

In total, these annual indirect impacts create over 500 jobs and labour compensation of about $28 million (see Table 2). Average labour compensation is roughly $56,000 – slightly higher than the provincial average. A further $48 million is added to Ontario GDP annually.

It is estimated (see Table 3) that almost 20% of these 504 jobs require a University Degree (Skill Level A) and another 36% require the equivalent of College or Apprenticeship Accreditation (Level B). Just under 50 of the jobs, or roughly 10%, require only On-the-Job Training (Level D).

Induced Impacts – Second Level Down

The economic impacts of the new gold mine are not confined to its direct and indirect effects. At a second level down, there are the induced impacts of the mine's construction. This is the economic activity that is generated when the construction workers at both the mine and its upstream providers spend their wages (after tax, and after savings, of course). There is also an additional but rather small effect as those working to provide consumer goods and services to the mine construction workers and the upstream employees in turn spend their own after-tax wages.

The construction workers and those producing mining equipment, together with their suppliers, spend on consumer goods and services in such a way that a further 413 jobs are supported with labour compensation of $18 million. Ontario GDP is enhanced by a further $43 million annually.

It is estimated that roughly 10% of these 413 jobs are in Management positions. Approximately the same share (30%) of the jobs require College/Apprenticeship Accreditation (Skill Level B) or Secondary School or Specific Occupation Training (Level C). 65 of the jobs, or roughly 16% require only On-the-Job Training (Level D).

When the direct, indirect and induced economic impacts are totaled, the construction of the new open pit gold mine generates over 1,900 jobs per year in Ontario over the three year construction period and adds just under $183 million per year to Ontario GDP, with labour compensation of $112 million annually. Almost half (845) of these jobs require College or Apprenticeship Certification (Skill Level B), while another quarter (472) require Secondary School or Specific Occupation Training (Level C). Somewhat over 10% (206) of the jobs require only On-the-Job Training (Level D), roughly the same number of Management positions (214) and somewhat higher than jobs (177) requiring a University Degree (Level A). To put this in perspective, for the Ontario economy as a whole, the share of Management jobs is 8.6%, Level A jobs 19.2%, Level B jobs 32.8%, Level C jobs 27.9%, and Level D jobs 11.5%.

'Local' Impacts – Third Level Down

As in our previous study of a representative nickel/copper mine in the province, we have taken a stab at estimating the local community economic impact retention. As mentioned earlier, because the new gold mine is assumed to be constructed in a relatively remote part of the province, we have decided on a more 'regional' notion of what 'local' means. Effectively, the definition of local would include the nearest major town/city that would have significant public (including a hospital and schools) and private facilities available. We carefully categorized the individual industrial impacts at the indirect and induced level into those which might reasonably be expected to remain in the so-defined local region of the mine (for example, various personal or business services, construction or utilities).

Also, we identified those that are sourced generally across the province (for example, most manufactured goods and raw materials). Even so, it is clear for some industries that both local and province-wide impacts might occur. For example, to the extent that the construction of the mine requires financial services and those working building the mine will consume financial services, some of this will be provided from regional bank branches or other institutions. However, some also will be sourced at head offices or

computing centres primarily in the Greater Toronto area. In these cases, we have assigned estimates of the proportion of the sector activity that is likely to remain in the region of the mine site. Clearly, if we had been more restrictive in the definition of 'local' these impacts would be much smaller.

Construction, and much of its supply, tends to is heavily localized. However, because the mine is assumed to be in a relatively remote location, it is possible that a larger proportion of workers will be from outside the region, unless we assume that there are sufficient workers and construction infrastructure in the local area to support the building of the new mine. (If some of the workers and construction activity had to come temporarily from other regions of the province, then the provincial impacts would be largely unchanged, but the local impacts would be correspondingly smaller.) Roughly 1,350 of the over 1,900 total jobs created per year are expected to remain in the 'local' region, as does $79 million of the labour compensation and $117 million of the GDP impact.

Given that the mine is assumed to be located in a relatively remote area of the province, the local impacts could be seen at least to some extent as a proxy for the scope of the possible opportunities for Aboriginal individuals and businesses in the local and regional community. We attempt to identify these opportunities by identifying the skill mix for the jobs that have been identified as 'local'.

Almost half (614) of the 1,347 'local' jobs require College or Apprenticeship Certification (Level B) while another 291 (over 20%) require Secondary School or Specific Occupation Training (Level C). Almost 12% (160) of the jobs require only On-the-Job Training (Level D), roughly the same number of Management positions (164) and much higher than jobs (118) requiring a University Degree (Level A). Identifying the types of skills required by local individuals to take advantage of these opportunities should provide important information on the type of training required to allow them to fully participate in the project. The Mining Industry Human Resources Council (MiHR) has prepared *The Mining Industry Human Resources Guide for Aboriginal Communities* that also identifies the types of jobs and earning potential opportunities that are available

in the mining industry itself, as well as a helpful guide to the human resources side of mining.

Impacts on Government Revenue

Using a variety of calculation methods, it is possible to estimate the revenue impacts by level of government for the construction of a new open pit gold mine. These are shown in Table 4.

From the $250 million annual expenditure on the mine's construction, the federal government earns about $22 million[3] in revenue, with over half coming from the personal income tax, and the remainder spread fairly evenly across the corporate income tax, Employment Insurance premiums and all other federal taxes.

The provincial government is estimated to take in about $25 million in revenue, with the largest contributors being the sales tax (which in Table 4 is part of the "Other Provincial Taxes") and the personal income tax. A total of $7 million is collected annually through the Workplace Safety and Insurance Board (WSIB) premiums, corporate tax and the Employer Health Tax (EHT).

Local governments in the province should derive about $7 million in revenue from the construction and machinery activity, with roughly $4.4 million of this staying in the vicinity of the new mine itself.[4]

Lastly, the Canada Pension Plan gains $6.4 million in Ontario in new annual contributions while the mine construction is occurring. The total Ontario impact on government revenues through all levels of activity is more than $60 million per year.

[3] Federal revenue estimates are from economic activity generated in Ontario only. Given that the new mine also generates some economic activity in the rest of Canada, total federal revenues generated would be somewhat higher than those reported here.

[4] Given that the mine is located in an unspecified location in Northern Ontario, we have used average local tax rates to estimate this impact.

I.2 A New Open Pit Gold Mine – Production Impacts

A New Open Pit Gold Mine – Surface Level

Working with the Ontario Mining Association, its members and precious metals analaysts, we have estimated the size of the annual operating expenditures of a new open pit gold mine. The definition of the gold mine conforms closely with one of the industrial sub-definitions Statistics Canada uses to characterize the mining industry and to collect and organize its data. Included in this definition of mining is also the initial milling of the raw ore as it comes out of the ground. The mine is assumed to be located in Northern Ontario in a relatively remote area.

The immediate problem we faced was that while the open pit gold mine conformed to the Statistics Canada definition of gold mining, there has not been a significant amount of open pit gold mining in Ontario until very recently. We therefore had to effectively construct a production function for the open pit mine using information available from recently opened open pit gold mines, together with a number currently going through the environmental assessment/permitting process.

The new mine (see Table 5) then has annual sales of approximately $300 million (all dollar figures are in Canadian currency at 2014 purchasing power). It employs 440 full-time workers of all kinds earning an average wage of approximately $97,500 per year. In addition, the employer pays its share of Employment Insurance and Canada Pension, funds significant employee benefits, and makes a contribution to employee pensions. In total, $62.6 million of the $300 million earned by the mine is spent on employment compensation. The total employment compensation per employee is over $142,000 (this includes employee benefits, pension contributions, WSIB premiums and the employer portion of Canada Pension Plan contributions and Employment Insurance premiums).

A further $45 million goes to capital consumption allowances to replace capital and facilities that wear out in the course of a year's production and another $45 million is the gross profit. Finally, $147.4 million will be spent on all of the purchased inputs required

for the mine's operation during the course of the year. The annual direct impact on GDP of the open pit mine operations totals close to $153 million (see Table 6).

As we did with the open pit mine construction, we can take the annual job creation numbers generated in Table 6 and using the NOC measures of 'skills' required to perform jobs in the Ontario economy, we get a measure of the 'skill mix' for the annual direct job impacts from the operations of a new open pit gold mine (see Table 7). It is estimated that well over half (253) of the annual 440 jobs directly created by the operations of the open pit gold mine require the equivalent of College or Apprenticeship Accreditation (Skill Level B). 91 of the jobs (21%) need Secondary School or Specific Occupation Training (Level C) and 33 of the jobs require only On-the-Job Training (Level D). Management and jobs requiring a University Degree (Level A) together comprise almost 15% of the total.

Indirect Impacts – First Level Down

The purchased inputs required for the mine's operation are what give us our first level 'beneath the ground' in economic impacts. When a mine, in the course of its operations, purchases replacement machinery, transportation, and a variety of financial and scientific services, it is generating more employment, more wage income, and more GDP for Ontario. Moreover, as mentioned above, as these various purchased inputs in turn purchase inputs for their own operation, yet more economic activity is generated in the province.

As part of its operations, the mine wears out some of its capital equipment, which must be replaced -- these are the capital consumption allowances or 'sustaining capital' noted in Table 5. As these funds are spent to replace capital equipment additional economic activity is generated in the province.

The sum of these indirect economic impacts is considerable: Calculations show (see Table 6) that the total indirect impact amounts to over 845 jobs in Ontario, approximately $93 million of GDP and close to $60 million of labour compensation.

It is estimated (see Table 7) that more than 40% (355) of these annual 846 jobs indirectly created by the operations of the open pit gold mine require the equivalent of College or Apprenticeship Accreditation (Skill Level B). Another 233 of the jobs (28%) need Secondary School or Specific Occupation Training (Level C) and 78 of the jobs require only On-the-Job Training (Level D). Management and jobs requiring a University Degree (Level A) together comprise over 20% of the total.

These indirect impacts are spread across a wide range of industrial sectors in the province. (See Appendix B Tables B.3 and B.4 for GDP and employment details.) There are also spinoffs to the other provinces, especially Québec, Alberta and British Columbia. In Appendix C Table C.2, we show the direct and indirect impacts on international imports into Ontario and Canada of the mine operations, which again reflects possible opportunities for Ontario and other Canadian businesses to replace these foreign suppliers.

Note that for the indirect impacts the average compensation per employee (which includes employer contributions to Employment Insurance, Canada Pension Plan, and employee benefits and pensions) is approximately $69,100. This is much lower than the $142,200 per employee paid directly at the mine, but is much higher than average Ontario labour compensation of roughly $55,000, reflecting the industrial nature of the inputs into mining. This comparison highlights how lucrative gold mine employment is and, correspondingly, how productive employment is in the new gold mine. Preliminary data available for 2013 find that, on average across the Metal Mining industry in Ontario, output per employee was roughly $740,000.

Induced Impacts – Second Level Down

As discussed in the mine construction section, induced impacts result from the spending of the wages and salaries earned in the direct and indirect levels of economic impacts.

Our calculations show (see Table 6) that the induced employment amounts to just over 535 jobs -- greater than the 440 employed in the mine directly. The total induced labour compensation is a further $23 million and the impact on GDP is almost $56 million. Average labour compensation per employee is roughly $43,500 – below Ontario average annual compensation of roughly $55,000, reflecting the nature of the higher proportion of part-time service sector jobs generated from the induced impacts.

It is estimated that roughly the same number (165) of the annual induced 536 jobs require the equivalent of College or Apprenticeship Accreditation (Skill Level B) or a Secondary School or Specific Occupation Training (Level C). 85 of the jobs require only On-the-Job Training (Level D), while Management and jobs requiring a University Degree (Level A) together comprise 124 positions.

When the direct, indirect and induced economic impacts are totaled, the annual operations of the new open pit gold mine generate more than 1,800 jobs per year in Ontario and add more than $300 million per year to Ontario GDP, with labour compensation of almost $145 million annually. Over 40% (773) of these jobs require College or Apprenticeship Certification (Level B) while over another quarter (487) requires Secondary School or Specific Occupation Training (Level C). Somewhat over 10% (196) of the jobs require only On-the-Job Training (Level D), somewhat higher than the number of Management positions (157), but lower than the number of jobs (211) requiring a University Degree (Level A). For the Ontario economy as a whole, the share of Management jobs is 8.6%, Level A jobs 19.2%, Level B jobs 32.8%, Level C jobs 27.9%, and Level D jobs 11.5%.

‘Local’ Impacts – Third Level Down

We use the same method to estimate the local impact as in the mine construction section.

Remembering the limitations described, we find (see Table 6) that a large proportion of the economic impacts of a new open pit gold mine that stay in Ontario also stay in the local region. Of the total employment of over 1,800 jobs generated by the mine, roughly 1,360 are in the local region. Total local labour compensation is $114 million, and local-area GDP is more than $240 million. Average labour compensation per employee (including employer contributions to government plans, pensions and employee benefits) is close to $84,000 per worker – with the figure higher for the local mine employees, and somewhat lower for others employed through indirect and further still for the induced impacts in the local regional area.

As in the mine construction analysis, we take the further step of estimating the employment impacts by skill level (see Table 7). It is again worth repeating that given the mine is assumed to be located in a relatively remote area of Ontario, the local impacts could be seen, at least to some extent, as a proxy for the scope of the possible opportunities for Aboriginal individuals and businesses in the local and regional community. We attempt to identify these opportunities by identifying the skill mix for the jobs that have been identified as ‘local’.

Close to 44% (597) of the annual 1,361 ‘local’ jobs require College or Apprenticeship Certification (Skill Level B) while another almost 25% (333) require Secondary School or Specific Occupation Training (Level C). Just under 12% (156) of the jobs require only On-the-Job Training (Level D), the same as the number of jobs requiring a University Degree (Level A) and much higher than the number of Management positions (119). Again, identifying the types of skills required by local individuals to take advantage of these opportunities should provide important information on the type of training required to allow them to fully participate in the project.

Impacts on Government Revenue

As for the open pit mine construction, we estimate the revenue impacts by level of government for the operations of the new open pit gold mine. These are summarized in Table 8.

From the impacts of annual production of $300 million of the gold mine, the federal government (in Ontario) is expected to see increased annual revenues of over $38 million. Close to half of this is from personal income tax collections, which are indeed substantial due to the mine workers' relatively high wages. Corporate income tax using the assumed profitability of the representative mine amounts to approximately $14 million while $3 million is collected through Employment Insurance premiums and a further $5 million from other various federal taxes (including the GST).

The provincial government receives over $38 million in annual revenue – the same as the federal government, but through different tax channels: About $8 million is collected through the personal income tax, and a further $11.5 million through the corporate income tax.

As part of the corporate income tax, the special Ontario Mining Tax nets the province $2.3 million assuming it is taxed as a remote mine. The Ontario Mining Tax is paid only by mineral producers, and is a profit-based royalty, which rises and falls in a fashion similar to the industry's cycles. In a time when the gold mine would see significant additional profits due to high gold prices, the Ontario Mining tax take from the gold mine would be considerably greater.

Contributions to the WSIB add $5 million to provincial collections and a further $2 million is paid as EHT. All other taxes, most importantly the sales tax, earn the provincial government approximately $11.5 million.

Local governments in Ontario are expected to collect approximately $11.5 million annually in revenue. A rough estimate is that over $9 million of this stays in the region

of the mine itself, with about $2.3 million going to local governments in other parts of the province.

Finally, the Canada Pension Plan also collects approximately $7 million in contributions in Ontario.

The overall revenue take for all levels of government is approximately $95 million or almost one third of the amount of the mine's output value. As with all the impacts detailed above, it is important to realize that the gold mine generates these revenues and economic impacts each year through possibly two decades, or more, of operation.

Other Impacts – Fourth Level Down

Thus far we have been dealing with economic impacts that can be carefully and conservatively quantified. A single new open pit gold mine as measured generates more than 1,900 jobs per year, representing $112 million annually in labour compensation and $183 million in GDP per year for the three years it takes to construct the mine. When in full operation it generates over 1,800 jobs when all impact levels are considered, representing almost $145 million in labour compensation and just over $300 million in gross domestic product per year. We have also found that a large share of this employment in GDP impact occurs within the local region surrounding the new mine and attempted to measure the types of skills/education required to work in these jobs.

But there are clearly a host of further economic and social impacts that can be associated with a new gold mine which, however, simply cannot be reliably quantified. Most notable among these is the economic activity associated with maintaining the local community that the mine makes possible. This includes all regional local government workers, teachers, police, fire and health care, and all the necessary infrastructure services that are associated with maintaining a community. Mining companies make many direct contributions to the well-being of their communities -- for instance, in the provision of medical centres, sports facilities, and recreation and community centres. In

larger communities and in mining regions, they support and fund universities, colleges and research facilities.

A mine situated in Northern Ontario, as most of them are, makes a special contribution to the well-being and development of Aboriginal communities. It targets efforts to employ and make available entrepreneurial activities to Aboriginal workers in mining activities and it sustains and develops the surrounding communities. Even when a mine closes, it leaves behind its infrastructure, an improved social fabric and a body of acquired transferable skills that can be used to sustain the community's development into the future.

Moreover, the mining industry is not static: New mines come into production and older ones can be phased out. The development of a new mine requires significant expenditure on exploration and analysis that employs some very high-productivity (and high-paid) technicians – none of which is included in our impact estimates. Even a phased-out mine generates ongoing economic activity as the site continues to be rehabilitated, returned to a natural state, and is continually monitored. Indeed, mining is best considered as a 'temporary' land use, in that all currently active mines in Ontario, and any new mines, are required to have closure plans. They are also required to provide financial assurance to guarantee the completion of all approved reclamation activities to execute the closure plan.

II.1 A New Underground Gold Mine – Impacts of Mine Construction

In this section, we examine the economic impacts of constructing and bringing into production a new underground gold mine in Ontario. The construction of the mine is assumed to occur in a relatively remote area of Northern Ontario that does not already possess much of the necessary infrastructure for mining production. That is, to make the new mine viable, road and power network investments are necessary to tie into the existing infrastructure. As well, it is expected that facilities will be built so that

production workers live on-site and a mill of sufficient capacity commensurate with the size of the underground mine will be constructed.

As described earlier, there are layers of impacts to the mine being constructed or 'opened'. Using data from the Ontario Mining Association, from the Input-Output Division at Statistics Canada, and a variety of other sources, we develop direct, indirect, induced and local economic impacts from the construction of a new underground gold mine.

Construction of an Underground Gold Mine – Surface Level

In consultation with the Ontario Mining Association and gold analysts, we have determined that the construction of a new underground gold mine in a relatively remote area of the province would take about three years (see Table 9), with a total investment expenditure of about $600 million, or $200 million per year. We assume that roughly 20% or $120 million of the total will be spent on the mill and another $65 million on connecting the new mine to existing infrastructure. As noted earlier, we are capturing the impact of the actual construction phase here. Several years at least will have had to have been spent in advance in exploration, analysis, environmental assessment and obtaining all necessary permits and community involvement.

The direct impacts of the mine construction activity and the acquisition and putting in place of the mine machinery are considerable (see Table 10): Employment generated is estimated at 805 jobs per year, with total labour compensation of $53 million annually. The labour compensation per employee is about $66,000 – considerably above the provincial average rate (although again below that earned in gold mining production) due to the skilled and intense nature of the construction activity. Ontario GDP is directly increased by $74 million annually.

As we did for the construction of the open pit mine, we take the annual job creation numbers generated in Table 10 and using the NOC measures of 'skills' required to

perform jobs in the Ontario economy, we get a measure of the 'skill mix' for the direct job impacts from the construction of a new underground gold mine (see Table 11). It is estimated that over half (431) of the annual 805 jobs directly created by the construction of the underground gold mine require the equivalent of College or Apprenticeship Accreditation (Skill Level B). 170 jobs (21%) need Secondary School or Specific Occupation Training (Level C) and over 75 jobs require only On-the-Job Training (Level D).

Indirect Impacts – First Level Down

As discussed for the construction of the open pit mine, the indirect impacts occur through providing inputs to the direct economic activity (when they are not imported) and of inputs to these inputs, and so on back up the production chain. In Appendix B Tables B.5 and B.6, the extent of the impact on industries across Ontario, and indeed Canada, is revealed. In Appendix C, Table C.3 indicates the annual direct and indirect impacts on international imports into Ontario and Canada of the construction of a new underground mine, reflecting further possible opportunities for Ontario and Canadian businesses.

In total, the indirect impacts for the construction of a new underground mine create 415 jobs and labour compensation of more than $23 million annually (see Table 10). Average annual labour compensation is about $56,500 – somewhat higher than the provincial average. A further $40 million is added to Ontario GDP annually.

It is estimated (see Table 11) that almost 20% (82) of these 415 jobs require a University Degree (Skill Level A), 36% (149) require the equivalent of College or Apprenticeship Accreditation (Level B) and 27% (114) require Secondary School or Specific Occupation Training (Level C). 40 of the jobs, or roughly 10%, require only On-the-Job Training (Level D).

Induced Impacts – Second Level Down

As discussed earlier, induced impacts result from the spending of the wages and salaries earned in the direct and indirect levels of economic impacts. The construction workers and those producing mining machinery, together with their suppliers, spend on consumer goods in such a way that a further 340 jobs are supported with labour compensation of $15 million. Ontario GDP is enhanced by a further $35.5 million annually.

It is estimated that roughly 10% (35) of these 340 jobs are in Management positions. Approximately the same share (30%) of the jobs require College/Apprenticeship Accreditation (Skill Level B) or Secondary School or Specific Occupation Training (Level C). 54 of the jobs, or roughly 16% require only On-the-Job Training (Level D).

When you total the direct, indirect and induced economic impacts, the construction of the new underground mine generates 1,560 jobs per year in Ontario over a three year period and adds just under $150 million per year to Ontario GDP, with labour compensation of $91 million annually. Roughly 44% (685) of these jobs require College or Apprenticeship Certification (Skill Level B) while another quarter (387) requires Secondary School or Specific Occupation Training (Level C). Almost 11% (169) of the jobs require only On-the-Job Training (Level D), roughly the same number of Management positions (174) and higher than jobs (146) requiring a University Degree (Level A).

'Local' Impacts – Third Level Down

As we did for the open pit mine, we have made an indirect estimate of the local economic impact retention. The definition for 'local' is the same.

As mentioned, construction, and much of its supply, tends to be heavily localized. However, because the mine is assumed to be in a relatively remote location, it is possible that a larger proportion of workers will be from outside the region (unless we assume that there are sufficient workers and construction infrastructure in the local area to support the

building of the mine). If some of the workers and construction activity had to come temporarily from other regions of the province, then the provincial impacts would be largely unchanged, but the local impacts would be correspondingly smaller. Just under 1,100 of the 1,560 total jobs created per year remain in the local region, as does $64 million of the labour compensation and almost $96 million of the GDP impact.

As already discussed, given that the mine is assumed to be located in a relatively remote area of the province, the local impacts could be seen as a proxy for the scope of the possible opportunities for Aboriginal individuals and businesses. We again make an attempt to identify the types of skills required by individuals to take advantage of these opportunities and the type of training perhaps required to allow them to fully participate in the creation and operation of the new mine.

Per our analysis using the National Occupational Classification system, roughly 45% (496) of the 1,096 'local' jobs require College or Apprenticeship Certification (Level B) while another 22% (239) require Secondary School or Specific Occupation Training (Level C). 12% (131) of the jobs require only On-the-Job Training (Level D), roughly the same number of Management positions (133) and much higher than jobs (96) requiring a University Degree (Level A).

Impacts on Government Revenue

Again using a variety of calculation methods, we estimate the revenue impacts by level of government for the construction of a new underground gold mine. These are shown in Table 12.

From the $200 million annual expenditure on the construction of the mine, the federal government earns about $18 million in revenue, with over half coming from the personal income tax, and the remainder spread fairly evenly across the corporate income tax, Employment Insurance premiums and all other federal taxes (including the GST).

The provincial government is estimated to take in over $20 million in revenue annually, with close to $5 million coming from the personal income tax. A total of $5.6 million is collected annually through WSIB premiums, corporate tax and the EHT. All other taxes, the most important being the sales tax (part of other provincial taxes), raise another $10 million.

Local governments in Ontario should derive about $5.7 million in revenue annually from the construction of the new underground mine, with roughly $3.6 million of this staying in the region of the new mine itself.

Lastly, the CPP gains more than $5 million in new annual contributions in Ontario while the mine is being constructed. The total of the direct, indirect, and induced impacts on revenues for all levels of government in Ontario is just under $50 million per year.

II.2 A New Underground Gold Mine – Production Impacts

A New Underground Gold Mine – Surface Level

Working with the Ontario Mining Association, its members, and precious metals analysts, we have estimated the size of the annual operating expenditures of a new underground gold mine. The definition of the mine conforms closely with one of the industrial sub-definitions Statistics Canada uses to characterize the mining industry and to collect and organize its data. Included in this definition of gold mining is also the initial milling of the ore as it comes out of the ground. The mine is assumed to be located in Northern Ontario in a relatively remote area.

The new mine (see Table 13) has annual sales of approximately $300 million (all dollar figures are in Canadian currency at 2014 purchasing power). It employs 620 full-time workers of all kinds earning an average wage of approximately $100,000 per year (somewhat higher than the average wage for the open pit mine due to the different nature of the mining involved). In addition, the employer pays its share of Employment

Insurance and Canada Pension, funds significant employee benefits, and makes a contribution to employee pensions. In total, just over $90 million of the $300 million earned by the mine is spent on employment compensation. The total employment compensation per employee is over $145,000 (this includes benefits, pension contributions, WSIB premiums, the EHT, and the employer portion of Canada Pension Plan Contributions and Employment Insurance premiums).

As in the open pit mine a further $45 million goes to capital consumption allowances to replace capital and facilities that wear out in the course of a year's production and another $45 million is the gross profit of the owning corporation. Finally, $119.8 million will be spent on all of the purchased inputs required for the mine's operation during the course of the year. The annual direct impact on GDP of the underground mine operations totals $180 million (see Table 14).

As we did with the underground gold mine construction, we take the annual job creation numbers generated in Table 14 and using the NOC measures of 'skills' required to perform jobs in the Ontario economy, we get a measure of the 'skill mix' for the annual direct job impacts from the operations of a new underground gold mine (see Table 15). It is estimated that well over half (357) of the annual 620 jobs directly created by the operations of the underground gold mine require the equivalent of College or Apprenticeship Accreditation (Skill Level B). 128 of the jobs (21%) need Secondary School or Specific Occupation Training (Level C) and 46 of the jobs require only On-the-Job Training (Level D). Management and jobs requiring a University Degree (Level A) together comprise over 14% of the total.

Indirect Impacts – First Level Down

The purchased inputs required for the mine's operation are what give us our first level 'beneath the ground' in economic impacts. When a mine, in the course of its operations, purchases replacement machinery, transportation, and a variety of financial and scientific services, it is generating more employment, more wage income, and more GDP for

Ontario. Moreover, as mentioned above, as these various purchased inputs in turn purchase inputs for their own operation, yet more economic activity is generated in the province.

As part of its operations, the mine wears out some of its capital equipment, which must be replaced -- these are the capital consumption allowances (sustaining capital) noted in Table 13. As these funds are spent to replace capital equipment additional economic activity is generated in the province.

The sum of these indirect economic impacts is significant. We estimate (see Table 14) that the annual total indirect impact amounts to almost 900 jobs in Ontario, approximately $85 million of GDP and $55 million of labour compensation.

It is estimated that just under 40% (344) of these annual 894 jobs indirectly created by the operations of the underground gold mine require the equivalent of College or Apprenticeship Accreditation (Skill Level B). Another 224 of the jobs (25%) need Secondary School or Specific Occupation Training (Level C) and almost 12% (105) of the jobs require only On-the-Job Training (Level D). Management and jobs requiring a University Degree (Level A) together comprise almost 25% of the total.

These indirect impacts are spread across a wide range of industrial sectors in the province and across the country (see Appendix B Tables B.7 and B.8 for details). In Appendix C, Table C.4 we show the extent of the direct and indirect impacts on international imports into Ontario and Canada of the underground gold mine operations, indicating the scope of opportunity that remains for Ontario and Canadian suppliers.

Note that for the indirect impacts the average compensation per employee (which includes employer contributions to Employment Insurance, Canada Pension Plan, and employee benefits and pensions) is approximately $54,500. This is much lower than the $145,500 per employee paid directly at the mine, but is much more in line with average Ontario labour compensation. This comparison highlights how lucrative mine employment is and, correspondingly, how productive employment is in the new gold

mine. As mentioned earlier preliminary data available for 2013 find that, on average across the Metal Mining industry in Ontario, output per employee was roughly $740,000.

Induced Impacts – Second Level Down

As discussed, induced impacts result from the spending of the wages and salaries earned in the direct and indirect levels of economic impacts.

Our calculations show that the induced employment amounts to 690 jobs -- greater than the 620 employed in the underground mine directly. The total induced labour compensation is a further $30 million and the impact on GDP is almost $72 million. Average labour compensation per employee is roughly $43,500 – again below Ontario average compensation, reflecting the nature of the higher proportion of part-time service sector jobs generated from the induced impacts.

It is estimated that roughly the same number (210) of the annual induced 690 jobs require the equivalent of College or Apprenticeship Accreditation (Skill Level B) or a Secondary School or Specific Occupation Training (Level C). 110 of the jobs require only On-the-Job Training (Level D), while Management and jobs requiring a University Degree (Level A) together total 159 positions.

When the direct, indirect and induced economic impacts are totaled, the annual operations of the new underground gold mine generate over 2,200 jobs per year in Ontario and add more than $336 million per year to Ontario GDP, with labour compensation of almost $175 million annually. Over 41% (913) of these jobs require College or Apprenticeship Certification (Skill Level B) while over another quarter (562) requires Secondary School or Specific Occupation Training (Level C). Close to 12% (261) of the jobs require only On-the-Job Training (Level D), much higher than the number of Management positions (182), but somewhat lower than the number of jobs (286) requiring a University Degree (Level A). For the Ontario economy as a whole, the

share of Management jobs is 8.6%, Level A jobs 19.2%, Level B jobs 32.8%, Level C jobs 27.9%, and Level D jobs 11.5%.

'Local' Impacts – Third Level Down

We use the same method to estimate the local impact as in the mine construction section.

Remembering the limitations described, we again find that a large proportion of the economic impacts of a new underground gold mine that stay in Ontario also stay in the 'local' region. Of the annual total employment of roughly 2,200 jobs generated by the mine, almost 1,700 are estimated to be in the region of the mine. Total local labour compensation is $144 million, and local-area GDP is just under $275 million. Average labour compensation per employee (including employer contributions to government plans, pensions and employee benefits) is over $85,000 per worker – with the figure higher for the local mine employees, and somewhat lower for others employed through indirect and lower still for the induced impacts in the local regional area.

As in the mine construction analysis, we take the further step of estimating the local employment impacts by skill level (Table 15). Close to 43% (725) of the annual 1,691 'local' jobs require College or Apprenticeship Certification (Skill Level B) while another 24% (408) require Secondary School or Specific Occupation Training (Level C). Just over 12% (205) of the jobs require only On-the-Job Training (Level D), roughly the same as the number of jobs (212) requiring a University Degree (Level A) and much higher than the number of Management positions (141). Again, identifying the types of skills required by local individuals to take advantage of these opportunities should provide important information on the type of training required to allow them to fully participate in the project.

Impacts on Government Revenue

We again estimate the revenue impacts by level of government for the operations of the new underground gold mine. These are summarized in Table 16.

From the annual production of $300 million of the gold mine, the federal government both directly and indirectly sees increased revenues of approximately $39 million.[5] About one half of this is from personal income tax collections (again substantial on the highly paid mine workers themselves). Total corporate income tax, including that on the assumed profitability of the new gold mine, amounts to approximately $10.5 million while $3.4 million is collected through Employment Insurance premiums and a further $5.3 million from various federal taxes (including the GST and gasoline taxes).

The provincial government receives about $42.6 million in revenue – slightly more than the federal government, but through different tax channels: About $10 million is collected through the personal income tax, and a further $9.3 million through the corporate income tax. As part of the corporate income tax, the special Ontario Mining Tax nets the province $2.3 million under the assumed 'normal' profitability of the remote gold mine. The Ontario Mining Tax is paid only by mineral producers, and is a profit-based royalty, which rises and falls in a fashion similar to the industry's cycles.

Contributions to the WSIB add more than $6 million to provincial collections and a further $2.4 million is paid as EHT. All other taxes, most importantly the sales tax, earn the provincial government approximately $14.5 million annually.

Local governments in Ontario collect on balance approximately $12.8 million in annual revenue. A rough estimate is that over $10 million of this is within the local region of the mine itself, with about $2.4 million going to local governments in other parts of the province.

[5] As mentioned earlier, federal revenue estimates are from economic activity generated in Ontario only.

Finally, the Canada Pension Plan also collects approximately $7.8 million in contributions annually in Ontario.

The overall revenue take for all levels of government is more than $102 million or more than one third of the amount of the mine's output value. As with all the impacts detailed above, it is once again important to remember that the underground gold mine generates these revenues and economic impacts each year through possibly two decades or more of operation.

As previously noted for the open pit gold mine, there are numerous other contributions that the construction and operation of a new underground gold mine would make to the local community that are extremely difficult to quantify, but nonetheless very important.

III. Potential Benefits to Aboriginal Communities

The construction and ongoing production activities of a new gold mine in a remote location in Northern Ontario – whether open pit or underground – will undoubtedly have major impacts and significant potential benefits for Aboriginal communities anywhere nearby.

Perhaps the most important of these potential benefits will be in the provision skills development along with employment and entrepreneurial opportunities. As we noted in our 2012 study *Mining: Dynamic and Dependable for Ontario's Future*, "Ensuring that aboriginals participate in the mining industry has become an increasing focus over the last number of years. As new mineral resources are discovered in increasingly northern and remote environments, agreements have been undertaken to make sure that, wherever possible, Aboriginal employment is encouraged. Mining is the largest private sector employer of Aboriginals in Canada." The number of Aboriginals working in mining across Canada increased 14% from 2007 to 2012. Data from the most recent OMA survey suggest that Aboriginal employment accounted for 9.7% of mining employment in Ontario in 2011, up from 9.5% in 2010.

This new report is, above all, an attempt to quantify the economic impacts of a new gold mine in Ontario. Because of the wide range of possible locations of new gold mines in Northern Ontario, and the heterogeneous nature and distribution of Aboriginal communities across the north, it has not been possible to estimate with any precision the impact such a mine might have on Aboriginal employment – although there would doubtless be such an impact. Evidence from recent gold projects would suggest that the opportunities are significant. What we could estimate is a breakdown of potential employment by skill level, which in turn is indicative of potential employment impacts if an Aboriginal community is close enough to a new project.

Take, for example, the employment by skill estimates for production of an open-pit mine (see Table 7). Directly at the mine itself 28.1% of the jobs (about 125 positions) require only on-the-job training or 'secondary school and/or specific occupation training' – with the mining companies clearly willing and able to provide that training to obtain workers in remote areas.

At the indirect level, the demand for employment without university or college skills is even higher, at just over 310 jobs. All mining companies in Northern Ontario are actively engaged in promoting and encouraging entrepreneurs in the provision of as many services as possible from nearby communities. Of course, workers employed directly or indirectly will be funneling part of their earnings back into the community in their demands for additional goods and services, and our calculations show that job opportunities at the secondary level or under, or with on-the-job training, are larger still at the 'induced' level. Our rough calculation of overall 'local' level (broadly defined) employment shows that over one-third is at Skill levels C and D which, with diligent training effort by the mining firms and by government, should be available for Aboriginal communities. In time, the Management level of Skill – which is the often the result of experience, not formal education – should also open up. As noted above, these skills will remain even when a mine eventually closes and could be transferred to other economic activity.

Beyond the employment impacts, and the encouragement of local entrepreneurship, there will also be direct monetary benefits to Aboriginal communities through Impact Benefit Agreements (IBAs). Such agreements vary widely and are subject to intense negotiations, (and are generally confidential) so we have not attempted to quantify the monetary flows resulting from them, but they will certainly occur and flow through additional funds to Aboriginal communities, which would be in addition to the 'induced' effects we calculate purely from the respending of labour income.

Finally, we have mentioned above (pp. 19-20) the various other difficult to quantify impacts that new mining activity will bring to remote communities. Perhaps first among these would be the intangible benefits of the provision of key infrastructure, such as access roads and electrical grid connections, as we have built into the costs of constructing either open-pit or underground mines in remote locations. As with transferable skills, these remain behind to benefit individuals and the remote community even when the mine eventually closes down.

Table 1: A New Ontario Open Pit Gold Mine in its Construction Phase

- Mine built in a relatively remote region of the province
- Assume that investment necessary to connect to existing regional infrastructure
- All dollar amounts are in millions of 2014 Canadian dollars

Total Mine Construction Cost	$750.0
Expenditure per Year over Three-Year Period	$250.0
Connecting to existing infrastructure (roads, power grid, etc)	$80.0
Construction of Mill	$300.0
Site Development, Facilities and Machinery & Equipment	$320.0
Engineering, Procurement, and Construction Management	$50.0

Table 2: Annual Economic Impacts of the Construction of a New Ontario Open Pit Gold Mine

- All dollar amounts are in millions of 2014 Canadian dollars
- Employment is in person-years

Annual Mine Construction Expenditure	$250.0
Surface Level - Direct Impacts	
Employment	996
Total Labour Compensation	$65.7
Gross Domestic Product	$91.6
Labour Compensation/Employee ($ '000)	$65.9
Level One - Indirect Impacts	
Employment	504
Total Labour Compensation	$28.2
Gross Domestic Product	$48.0
Labour Compensation/Employee ($ '000)	$55.9
Level Two - Induced Impacts	
Employment	413
Total Labour Compensation	$18.0
Gross Domestic Product	$43.1
Labour Compensation/Employee ($ '000)	$43.6
Total - Direct, Indirect and Induced Impacts	
Employment	1,913
Total Labour Compensation	$111.9
Gross Domestic Product	$182.7
Labour Compensation/Employee ($ '000)	$58.5
Level Three - Local Area Impacts	
Employment	1,347
Total Labour Compensation	$78.9
Gross Domestic Product	$116.9
Labour Compensation/Employee ($ '000)	$58.6

Table 3: Annual Employment Impacts of the Construction of a New Ontario Open Pit Gold Mine by Major Skill Category

- Employment is in person-years

Surface Level - Direct Impacts		
Total Employment	996	
Management	134	13.5%
Skill Level A - University Degree	24	2.5%
Skill Level B - College or Apprenticeship Certification	538	54.0%
Skill Level C - Secondary School and/or Specific Occupation Training	208	20.8%
Skill Level D - On-the-Job Training Usually Provided	92	9.2%
Level One - Indirect Impacts		
Total Employment	504	
Management	37	7.4%
Skill Level A - University Degree	100	19.8%
Skill Level B - College or Apprenticeship Certification	180	35.7%
Skill Level C - Secondary School and/or Specific Occupation Training	139	27.6%
Skill Level D - On-the-Job Training Usually Provided	48	9.6%
Level Two - Induced Impacts		
Total Employment	413	
Management	42	10.2%
Skill Level A - University Degree	53	12.9%
Skill Level B - College or Apprenticeship Certification	127	30.9%
Skill Level C - Secondary School and/or Specific Occupation Training	125	30.3%
Skill Level D - On-the-Job Training Usually Provided	65	15.8%
Total - Direct, Indirect and Induced Impacts		
Total Employment	1,913	
Management	214	11.2%
Skill Level A - University Degree	177	9.3%
Skill Level B - College or Apprenticeship Certification	845	44.2%
Skill Level C - Secondary School and/or Specific Occupation Training	472	24.7%
Skill Level D - On-the-Job Training Usually Provided	206	10.7%
Level Three - Local Area Impacts		
Total Employment	1,347	
Management	164	12.2%
Skill Level A - University Degree	118	8.7%
Skill Level B - College or Apprenticeship Certification	614	45.6%
Skill Level C - Secondary School and/or Specific Occupation Training	291	21.6%
Skill Level D - On-the-Job Training Usually Provided	160	11.9%

Table 4: Annual Government Revenue Impacts of the Construction of a New Ontario Open Pit Gold Mine

• All dollar amounts are in millions of 2014 Canadian dollars

	Total	Direct	Indirect	Induced
Total Annual Mine Construction Expenditure	$250.0			
Federal Government				
Personal Income Tax	$11.6	$7.4	$2.8	$1.4
Corporate Income Tax	$3.7	$1.7	$0.9	$1.2
Employment Insurance Premiums	$2.7	$1.6	$0.7	$0.4
Other Federal Taxes	$3.8	$0.9	$0.6	$2.3
Total:	$21.8	$11.5	$4.9	$5.4
Provincial Government				
Personal Income Tax	$5.7	$3.6	$1.4	$0.7
Corporate Income Tax	$2.5	$1.1	$0.6	$0.8
of which: Mining Tax	$0.0	$0.0		
Workplace Safety (WSIB) Premiums	$2.8	$1.6	$0.7	$0.4
Employer Health Tax	$1.6	$0.9	$0.4	$0.3
Other Provincial Taxes	$12.4	$4.3	$3.5	$4.5
Total:	$25.0	$11.6	$6.6	$6.7
Local Governments				
All Local Taxes	$6.9	$3.5	$1.8	$1.6
(Taxes in Mine Locality)	$4.4			
Canada Pension Plan Contributions	$6.4	$3.8	$1.6	$1.0
Ontario Total - All Governments	$60.2	$30.4	$15.0	$14.8

Table 5: A New Ontario Open Pit Gold Mine in Production - Characteristics

- Produces gold ore
- Includes initial on-site milling operations
- All dollar amounts are in millions of 2014 Canadian dollars

Mine Output/Sales	$300.0
Number of Employees on site	440
Average wage per employee ($ '000)	$97.5
Employment Costs	
Wage Bill	$42.9
Employee Benefits - including Pension Contributions	$14.2
Canada Pension, Employment Insurance, Workplace Safety, Employer Health Tax	$5.5
Total	$62.6
Capital Consumption Allowance (Sustaining Capital)	$45.0
Gross Profit (before taxes)	$45.0
Purchased Inputs and Production Costs	$147.4

Table 6: Annual Economic Impacts of A New Ontario Open Pit Gold Mine in Production

- All dollar amounts are in millions of 2014 Canadian dollars
- Employment is in person-years

Mine Output/Sales	$300.0
Surface Level - Direct Impacts	
Employment	440
Total Labour Compensation	$62.6
Gross Domestic Product	$152.6
Labour Compensation/Employee ($ '000)	$142.2
Level One - Indirect Impacts	
Employment	846
Total Labour Compensation	$58.5
Gross Domestic Product	$93.1
Labour Compensation/Employee ($ '000)	$69.1
Level Two - Induced Impacts	
Employment	536
Total Labour Compensation	$23.4
Gross Domestic Product	$55.8
Labour Compensation/Employee ($ '000)	$43.5
Total - Direct, Indirect and Induced Impacts	
Employment	1,822
Total Labour Compensation	$144.4
Gross Domestic Product	$301.5
Labour Compensation/Employee ($ '000)	$79.2
Level Three - Local Area Impacts	
Employment	1,361
Total Labour Compensation	$113.8
Gross Domestic Product	$242.5
Labour Compensation/Employee ($ '000)	$83.6

Table 7: Annual Employment Impacts of A New Ontario Open Pit Gold Mine in Production by Major Skill Category

- Employment is in person-years

Surface Level - Direct Impacts		
Total Employment	440	
Management	21	4.7%
Skill Level A - University Degree	43	9.7%
Skill Level B - College or Apprenticeship Certification	253	57.5%
Skill Level C - Secondary School and/or Specific Occupation Training	91	20.7%
Skill Level D - On-the-Job Training Usually Provided	33	7.4%
Level One - Indirect Impacts		
Total Employment	846	
Management	81	9.6%
Skill Level A - University Degree	100	11.8%
Skill Level B - College or Apprenticeship Certification	355	41.9%
Skill Level C - Secondary School and/or Specific Occupation Training	233	27.5%
Skill Level D - On-the-Job Training Usually Provided	78	9.2%
Level Two - Induced Impacts		
Total Employment	536	
Management	55	10.2%
Skill Level A - University Degree	69	12.8%
Skill Level B - College or Apprenticeship Certification	165	30.7%
Skill Level C - Secondary School and/or Specific Occupation Training	163	30.4%
Skill Level D - On-the-Job Training Usually Provided	85	15.9%
Total - Direct, Indirect and Induced Impacts		
Total Employment	1,822	
Management	157	8.6%
Skill Level A - University Degree	211	11.6%
Skill Level B - College or Apprenticeship Certification	773	42.4%
Skill Level C - Secondary School and/or Specific Occupation Training	487	26.7%
Skill Level D - On-the-Job Training Usually Provided	196	10.7%
Level Three - Local Area Impacts		
Total Employment	1,361	
Management	119	8.8%
Skill Level A - University Degree	156	11.4%
Skill Level B - College or Apprenticeship Certification	597	43.8%
Skill Level C - Secondary School and/or Specific Occupation Training	333	24.5%
Skill Level D - On-the-Job Training Usually Provided	156	11.5%

Table 8: Annual Government Revenue Impacts of A New Ontario Open Pit Gold Mine in Production

- All dollar amounts are in millions of 2014 Canadian dollars

	Total	Direct	Indirect	Induced
Mine Output/Sales	$300.0			
Federal Government				
Personal Income Tax	$16.8	$8.0	$7.0	$1.8
Corporate Income Tax	$13.9	$6.8	$5.6	$1.6
Employment Insurance Premiums	$3.0	$1.0	$1.4	$0.6
Other Federal Taxes	$4.7	$0.0	$1.7	$3.0
Total:	$38.4	$15.7	$15.7	$7.0
Provincial Government				
Personal Income Tax	$8.3	$4.1	$3.3	$0.9
Corporate Income Tax	$11.5	$6.8	$3.7	$1.0
of which: Mining Tax	$2.3	$2.3		
Workplace Safety (WSIB) Premiums	$5.0	$3.0	$1.4	$0.6
Employer Health Tax	$2.0	$0.8	$0.8	$0.3
Other Provincial Taxes	$11.5	$1.5	$4.2	$5.9
Total:	$38.4	$16.2	$13.5	$8.7
Local Governments				
All Local Taxes	$11.5	$5.8	$3.5	$2.1
(Taxes in Mine Locality)	$9.2			
Canada Pension Plan Contributions	$6.8	$2.1	$3.4	$1.3
Ontario Total - All Governments	$95.0	$39.8	$36.1	$19.1

Table 9: A New Ontario Underground Gold Mine in its Construction Phase

- Mine built in a relatively remote region of the province
- Assume that investment necessary to connect to existing regional infrastructure
- All dollar amounts are in millions of 2014 Canadian dollars

Total Mine Construction Cost	$600.0
Expenditure per Year over Three-Year Period	$200.0
Connecting to existing infrastructure (roads, power grid, etc)	$65.0
Construction of Mill	$120.0
Site Development, Facilities and Machinery & Equipment	$375.0
Engineering, Procurement, and Construction Management	$40.0

Table 10: Annual Economic Impacts of the Construction of a New Ontario Underground Gold Mine

- All dollar amounts are in millions of 2014 Canadian dollars
- Employment is in person-years

Annual Mine Construction Expenditure	$200.0
Surface Level - Direct Impacts	
Employment	805
Total Labour Compensation	$52.9
Gross Domestic Product	$74.4
Labour Compensation/Employee ($ '000)	$65.8
Level One - Indirect Impacts	
Employment	415
Total Labour Compensation	$23.4
Gross Domestic Product	$39.9
Labour Compensation/Employee ($ '000)	$56.5
Level Two - Induced Impacts	
Employment	340
Total Labour Compensation	$14.8
Gross Domestic Product	$35.5
Labour Compensation/Employee ($ '000)	$43.6
Total - Direct, Indirect and Induced Impacts	
Employment	1,560
Total Labour Compensation	$91.2
Gross Domestic Product	$149.8
Labour Compensation/Employee ($ '000)	$58.5
Level Three - Local Area Impacts	
Employment	1,096
Total Labour Compensation	$64.1
Gross Domestic Product	$95.7
Labour Compensation/Employee ($ '000)	$58.5

Table 11: Annual Employment Impacts of the Construction of a New Ontario Underground Gold Mine by Major Skill Category

- Employment is in person-years

Surface Level - Direct Impacts		
Total Employment	805	
Management	108	13.5%
Skill Level A - University Degree	20	2.5%
Skill Level B - College or Apprenticeship Certification	431	53.5%
Skill Level C - Secondary School and/or Specific Occupation Training	170	21.2%
Skill Level D - On-the-Job Training Usually Provided	76	9.4%
Level One - Indirect Impacts		
Total Employment	415	
Management	31	7.4%
Skill Level A - University Degree	82	19.8%
Skill Level B - College or Apprenticeship Certification	149	35.9%
Skill Level C - Secondary School and/or Specific Occupation Training	114	27.4%
Skill Level D - On-the-Job Training Usually Provided	40	9.5%
Level Two - Induced Impacts		
Total Employment	340	
Management	35	10.2%
Skill Level A - University Degree	44	12.9%
Skill Level B - College or Apprenticeship Certification	105	30.9%
Skill Level C - Secondary School and/or Specific Occupation Training	103	30.3%
Skill Level D - On-the-Job Training Usually Provided	54	15.8%
Total - Direct, Indirect and Induced Impacts		
Total Employment	1,560	
Management	174	11.1%
Skill Level A - University Degree	146	9.3%
Skill Level B - College or Apprenticeship Certification	685	43.9%
Skill Level C - Secondary School and/or Specific Occupation Training	387	24.8%
Skill Level D - On-the-Job Training Usually Provided	169	10.9%
Level Three - Local Area Impacts		
Total Employment	1,096	
Management	133	12.1%
Skill Level A - University Degree	96	8.8%
Skill Level B - College or Apprenticeship Certification	496	45.3%
Skill Level C - Secondary School and/or Specific Occupation Training	239	21.8%
Skill Level D - On-the-Job Training Usually Provided	131	12.0%

Table 12: Annual Government Revenue Impacts of the Construction of a New Ontario Underground Gold Mine

- All dollar amounts are in millions of 2014 Canadian dollars

	Total	Direct	Indirect	Induced
Total Annual Mine Construction Expenditure	$200.0			
Federal Government				
Personal Income Tax	$9.4	$5.9	$2.3	$1.2
Corporate Income Tax	$3.1	$1.4	$0.7	$1.0
Employment Insurance Premiums	$2.2	$1.3	$0.6	$0.4
Other Federal Taxes	$3.0	$0.7	$0.4	$1.9
Total:	$17.8	$9.3	$4.1	$4.4
Provincial Government				
Personal Income Tax	$4.7	$2.9	$1.2	$0.6
Corporate Income Tax	$2.1	$0.9	$0.5	$0.7
of which: Mining Tax	$0.0	$0.0		
Workplace Safety (WSIB) Premiums	$2.2	$1.3	$0.6	$0.4
Employer Health Tax	$1.3	$0.8	$0.3	$0.2
Other Provincial Taxes	$10.1	$3.5	$2.9	$3.7
Total:	$20.4	$9.4	$5.5	$5.5
Local Governments				
All Local Taxes	$5.7	$2.8	$1.5	$1.3
(Taxes in Mine Locality)	$3.6			
Canada Pension Plan Contributions	$5.2	$3.0	$1.3	$0.9
Ontario Total - All Governments	$49.2	$24.6	$12.4	$12.2

Table 13: A New Ontario Underground Gold Mine in Production - Characteristics

- Produces gold ore
- Includes initial on-site milling operations
- All dollar amounts are in millions of 2014 Canadian dollars

Mine Output/Sales	$300.0
Number of Employees on site	620
Average wage per employee ($ '000)	$100.0
Employment Costs	
Wage Bill	$62.0
Employee Benefits - including Pension Contributions	$20.5
Canada Pension, Employment Insurance, Workplace Safety, Employer Health Tax	$7.7
Total	$90.2
Capital Consumption Allowance (Sustaining Capital)	$45.0
Gross Profit (before taxes)	$45.0
Purchased Inputs and Production Costs	$119.8

Table 14: Annual Economic Impacts of A New Ontario Underground Gold Mine in Production

- All dollar amounts are in millions of 2014 Canadian dollars
- Employment is in person-years

Mine Output/Sales	$300.0
Surface Level - Direct Impacts	
Employment	620
Total Labour Compensation	$90.2
Gross Domestic Product	$180.2
Labour Compensation/Employee ($ '000)	$145.5
Level One - Indirect Impacts	
Employment	894
Total Labour Compensation	$54.5
Gross Domestic Product	$84.5
Labour Compensation/Employee ($ '000)	$60.9
Level Two - Induced Impacts	
Employment	690
Total Labour Compensation	$30.0
Gross Domestic Product	$71.8
Labour Compensation/Employee ($ '000)	$43.5
Total - Direct, Indirect and Induced Impacts	
Employment	2,204
Total Labour Compensation	$174.7
Gross Domestic Product	$336.5
Labour Compensation/Employee ($ '000)	$79.3
Level Three - Local Area Impacts	
Employment	1,691
Total Labour Compensation	$144.3
Gross Domestic Product	$274.8
Labour Compensation/Employee ($ '000)	$85.3

Table 15: Annual Employment Impacts of a New Ontario Underground Gold Mine in Production by Major Skill Category

- Employment is in person-years

Surface Level - Direct Impacts		
Total Employment	620	
Management	29	4.7%
Skill Level A - University Degree	60	9.7%
Skill Level B - College or Apprenticeship Certification	357	57.5%
Skill Level C - Secondary School and/or Specific Occupation Training	128	20.7%
Skill Level D - On-the-Job Training Usually Provided	46	7.4%
Level One - Indirect Impacts		
Total Employment	894	
Management	83	9.2%
Skill Level A - University Degree	138	15.4%
Skill Level B - College or Apprenticeship Certification	344	38.5%
Skill Level C - Secondary School and/or Specific Occupation Training	224	25.1%
Skill Level D - On-the-Job Training Usually Provided	105	11.7%
Level Two - Induced Impacts		
Total Employment	690	
Management	71	10.2%
Skill Level A - University Degree	88	12.8%
Skill Level B - College or Apprenticeship Certification	211	30.7%
Skill Level C - Secondary School and/or Specific Occupation Training	209	30.4%
Skill Level D - On-the-Job Training Usually Provided	110	16.0%
Total - Direct, Indirect and Induced Impacts		
Total Employment	2,204	
Management	182	8.3%
Skill Level A - University Degree	286	13.0%
Skill Level B - College or Apprenticeship Certification	913	41.4%
Skill Level C - Secondary School and/or Specific Occupation Training	562	25.5%
Skill Level D - On-the-Job Training Usually Provided	261	11.9%
Level Three - Local Area Impacts		
Total Employment	1,691	
Management	141	8.4%
Skill Level A - University Degree	212	12.5%
Skill Level B - College or Apprenticeship Certification	725	42.9%
Skill Level C - Secondary School and/or Specific Occupation Training	408	24.1%
Skill Level D - On-the-Job Training Usually Provided	205	12.1%

Table 16: Annual Government Revenue Impacts of A New Ontario Underground Gold Mine in Production

• All dollar amounts are in millions of 2014 Canadian dollars

	Total	Direct	Indirect	Induced
Mine Output/Sales	$300.0			
Federal Government				
Personal Income Tax	$19.9	$11.7	$5.9	$2.4
Corporate Income Tax	$10.5	$6.8	$1.8	$2.0
Employment Insurance Premiums	$3.4	$1.4	$1.3	$0.7
Other Federal Taxes	$5.3	$0.1	$1.4	$3.9
Total:	$39.2	$19.9	$10.3	$9.0
Provincial Government				
Personal Income Tax	$10.0	$6.0	$2.9	$1.2
Corporate Income Tax	$9.3	$6.8	$1.2	$1.3
of which: Mining Tax	$2.3	$2.3		
Workplace Safety (WSIB) Premiums	$6.3	$4.2	$1.3	$0.7
Employer Health Tax	$2.4	$1.2	$0.8	$0.4
Other Provincial Taxes	$14.5	$1.9	$5.1	$7.5
Total:	$42.6	$20.2	$11.2	$11.2
Local Governments				
All Local Taxes	$12.8	$6.8	$3.2	$2.7
(Taxes in Mine Locality)	$10.4			
Canada Pension Plan Contributions	$7.8	$3.0	$3.1	$1.7
Ontario Total - All Governments	$102.4	$49.9	$27.9	$24.6

Appendix A. Brief Description of the National Occupational Classification Skills Level Criteria

The National Occupational Classification (NOC) is a joint product of Human Resources and Skills Development Canada (HRSDC) and Statistics Canada. (For a complete description of the system see *National Occupation Classification 2011* available on the HRSDC website at

http://www5.hrsdc.gc.ca/NOC/English/NOC/2011/pdf/PrintableVersionNOC2011.pdf

The NOC is designed to classify occupational information from statistical surveys. The major attribute of jobs used as classification criteria in developing the NOC for this study is the skill level. HRSDC defines skill level as the amount and type of education and training required to enter and perform the duties of an occupation. In determining skill level, the experience required for entry, and the complexity and responsibilities typical of an occupation are also considered in relation to other occupations.

There are four skill level categories identified in the NOC reflecting four commonly accepted educational, training, or preparatory routes for entering employment. In addition to these four, the NOC has added a fifth criterion that measures management occupations. HRSDC notes that management is characterized by high levels of responsibility, accountability and subject matter expertise. Expertise is acquired through either formal education or extensive occupational experience. They therefore created a separate skill level category to reflect the unique nature of management positions.

NOC Skill Level Criteria – Education/Training and Other Criteria

Skill Level A – University Degree

- University Degree (bachelor's, master's or doctorate)

Skill Level B – College or Apprenticeship Certification

- Two to three years of post-secondary education at community college, institute of technology or CEGEP; or
- Two to five years of apprenticeship training; or
- Three to four years of secondary school and more than two years of on-the-job training, occupation-specific training courses or specific work expertise

- Occupations with supervisory responsibilities are also assigned to skill level B

- Occupations with significant health and safety responsibilities (e.g., firefighters, police officers and licensed practical nurses) are assigned to skill level B

Skill Level C – Secondary School and/or Specific Occupation Training

- Completion of secondary school and some short-duration courses or training specific to the occupation; or
- Some secondary school education, with up to two years on-the-job training, training courses or specific work experience

Skill Level D – On-the-Job Training Usually Provided

- Short work demonstration or on-the-job training; or
- No formal educational requirements

Appendix B: Impacts by Industrial Sector and by Province

A New Gold Mine Under Construction

Our calculations permit us to determine the impacts of the construction of a new mine on the different industrial sectors in Ontario, and in fact on those of other provinces as well. These industries can be measured capturing (1) the direct and indirect impacts and (2) impacts including the induced impacts from the spending of wages and salaries earned at the direct and indirect level. For the purposes of measuring the impact on the suppliers and the suppliers to the suppliers of the gold mine, we concentrate our discussion on (1). At the 'Small' or most highly-aggregated Statistics Canada industrial classification, these are presented in Appendix Tables B.1 (for GDP) and B.2 (for employment) for the construction of a new open pit mine and Appendix Tables B.5 (for GDP) and B.6 (for employment) for the construction of a new underground mine.

In Ontario, for both types of gold mines, the largest sectoral impact is on the Construction sectors, as might have been expected. The next largest sector is Manufacturing stemming from the demand for machinery and also for concrete, reinforcing rods and other inputs to Construction. A considerably portion of the actual machinery required by the mine comes from imports. The remaining impacts are spread widely among the other sectors, but note the important impacts on 'Finance, Insurance, Real Estate and Rental and Leasing and Holding Companies', reflecting both financing activity and the leasing or rental of special construction equipment as needed, and on 'Professional, Scientific and Technical Services', as there is much careful scientific planning and engineering work that goes into mine development.

The $250 million annual expenditure to construct an open pit gold mine in Northern Ontario generates indirect GDP impacts in the rest of the provinces of about $16 million per year. Over 40% of this impact is in Québec, with a large impact on manufacturing, and the next largest impact is in Alberta, based both on fuel requirements and again on manufacturing.

The $200 million annual expenditure to construct an underground gold mine in Northern Ontario generates indirect GDP impacts in the rest of the provinces of about $14 million per year. Again over 40% of this impact is in Québec, with the largest impact on manufacturing, and the next largest impact is in Alberta, based both on fuel requirements and again on manufacturing.

Impacts of the Operations of a New Gold Mine

The impacts of a new mine in production can also be examined by industrial sector, and again we can estimate the impacts on provinces outside of Ontario. These results for the direct and indirect impacts are presented in Appendix Tables B.3 (for GDP) and B.4 (for employment) for the new open pit gold mine and in Appendix Tables B.7 (for GDP) and B.8 (for employment) for the new underground gold mine.

Consider first the industrial impacts for Ontario: Of course, the largest impact is in the Mining industry, where the direct impacts of the new mine all occur. The remaining impacts are widely spread across other industrial sectors, with the primary impacts being in Utilities, the different types of Construction, Manufacturing, Trade (Wholesale and Retail), Finance, Insurance and Real Estate and Rental and Leasing and Holding Companies, Professional, Scientific and Technical Services, and Administrative Support, Waste Management and Remediation Services.

Most of the 'leakage' of demand for goods and services from both types of the new mine and from the indirect impacts tend to occur into imports from other countries, but there is still an important impact on several Canadian provinces. The biggest impact outside Ontario, both in terms of employment and GDP, occurs in Québec, predominantly in manufactured goods and wholesale trade. For both the open pit and underground mine operations, the next largest province impacted is Alberta where the GDP impact is predominantly in the provision of oil and gas, and the employment impact is spread relatively widely across a broad number of sectors.

The $300 million in annual revenue from the operations of the open pit gold mine in Ontario is estimated to generate indirect GDP impacts in the rest of the provinces of more than $23 million and 171 jobs per year. The $300 million in annual revenue from the operations of a new underground gold mine in Ontario is seen to generate indirect GDP impacts in the rest of the provinces of almost $18 million and 148 jobs per year.

As discussed, we have concentrated on the indirect impacts to get a sense of the impact on the suppliers and the suppliers to the suppliers of the gold mining industry. The induced impacts from the spending of wages and salaries, of course, would also impact many industries across the province and the country. We have included these impacts in Appendix Tables B.9 to B.16.

Table B.1 Direct and Indirect Annual GDP Impacts of the Construction of a New Open Pit Gold Mine ($ Thousands)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	57	14	6	2	92
Forestry and logging	59	34	5	31	145
Fishing, hunting and trapping	0	0	0	0	1
Support activities for agriculture and forestry	13	13	2	4	38
Mining, quarrying, and oil and gas extraction	3,234	226	1,132	136	6,196
Utilities	988	238	39	26	1,358
Non-residential building construction	28,130	0	0	0	28,130
Engineering construction	38,699	0	0	0	38,699
Repair construction	432	34	21	13	536
Other activities of the construction industry	220	8	8	3	241
Manufacturing	19,646	2,980	895	606	25,268
Wholesale trade	19,061	1,080	203	253	20,815
Retail trade	1,683	97	52	50	1,931
Transportation and warehousing	2,835	459	248	230	4,214
Information and cultural industries	1,367	156	92	75	1,779
Finance, insurance, real estate, rental and leasing and holding companies	7,490	536	263	170	8,677
Professional, scientific and technical services	11,911	486	358	183	13,047
Administrative and support, waste management and remediation services	2,046	235	117	61	2,534
Educational services	56	2	1	1	61
Health care and social assistance	53	6	1	2	64
Arts, entertainment and recreation	94	20	4	7	130
Accommodation and food services	291	45	23	25	409
Other services (except public administration)	450	45	86	18	622
Non-profit institutions serving households	39	4	1	1	48
Government education services	191	11	6	4	219
Government health services	39	6	2	1	52
Other federal government services	187	14	3	4	215
Other provincial and territorial government services	54	13	2	3	78
Other local government services	299	18	12	12	349
Total	**139,625**	**6,781**	**3,581**	**1,924**	**155,949**

Table B.2 Direct and Indirect Annual Employment Impacts of the Construction of a New Open Pit Gold Mine (Number of Jobs)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	1	0	0	0	2
Forestry and logging	1	0	0	0	2
Support activities for agriculture and forestry	0	0	0	0	1
Mining, quarrying, and oil and gas extraction	20	1	2	0	25
Utilities	3	0	0	0	4
Non-residential building construction	361	0	0	0	361
Engineering construction	395	0	0	0	395
Repair construction	6	0	0	0	7
Other activities of the construction industry	1	0	0	0	1
Manufacturing	208	34	8	7	270
Wholesale trade	158	11	1	3	175
Retail trade	39	2	1	1	44
Transportation and warehousing	36	7	2	3	53
Information and cultural industries	10	1	1	1	13
Finance, insurance, real estate, rental and leasing and holding companies	51	5	2	1	60
Professional, scientific and technical services	135	7	3	3	149
Administrative and support, waste management and remediation services	42	5	2	1	51
Educational services	2	0	0	0	2
Health care and social assistance	1	0	0	0	1
Arts, entertainment and recreation	2	1	0	0	3
Accommodation and food services	10	1	1	1	13
Other services (except public administration)	10	1	1	0	13
Non-profit institutions serving households	1	0	0	0	1
Government education services	2	0	0	0	2
Government health services	0	0	0	0	1
Other federal government services	1	0	0	0	2
Other provincial and territorial government services	0	0	0	0	1
Other local government services	3	0	0	0	4
Total	**1,500**	**78**	**24**	**23**	**1,655**

Table B.3 Direct and Indirect Annual GDP Impacts of a New Operating Open Pit Gold Mine ($ Thousands)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	117	31	12	3	193
Forestry and logging	28	14	2	14	65
Fishing, hunting and trapping	0	0	0	0	2
Support activities for agriculture and forestry	10	6	3	3	26
Mining, quarrying, and oil and gas extraction	158,689	487	4,164	452	166,314
Utilities	22,299	829	89	42	23,384
Non-residential building construction	197	0	0	0	197
Engineering construction	10,086	0	0	0	10,086
Repair construction	6,640	46	54	22	6,801
Other activities of the construction industry	132	8	12	3	159
Manufacturing	12,660	3,523	920	631	18,751
Wholesale trade	10,750	778	314	235	12,406
Retail trade	1,219	95	59	47	1,466
Transportation and warehousing	4,376	632	490	323	6,575
Information and cultural industries	1,927	192	141	106	2,483
Finance, insurance, real estate, rental and leasing and holding companies	5,675	514	394	186	7,027
Professional, scientific and technical services	6,766	483	367	186	7,938
Administrative and support, waste management and remediation services	1,689	237	178	71	2,262
Educational services	39	2	2	1	45
Health care and social assistance	192	8	2	2	206
Arts, entertainment and recreation	153	28	5	11	202
Accommodation and food services	379	51	31	33	523
Other services (except public administration)	321	51	79	21	497
Non-profit institutions serving households	50	5	2	2	60
Government education services	311	9	6	4	337
Government health services	57	6	3	2	71
Other federal government services	388	17	4	4	421
Other provincial and territorial government services	217	16	3	4	247
Other local government services	282	23	17	14	349
Total	**245,651**	**8,089**	**7,352**	**2,424**	**269,095**

Table B.4 Direct and Indirect Annual Employment Impacts of a New Operating Open Pit Gold Mine (Number of Jobs)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	2	0	0	0	3
Forestry and logging	0	0	0	0	1
Support activities for agriculture and forestry	0	0	0	0	0
Mining, quarrying, and oil and gas extraction	482	2	7	1	493
Utilities	81	1	0	0	83
Non-residential building construction	3	0	0	0	3
Engineering construction	110	0	0	0	110
Repair construction	97	1	1	0	99
Other activities of the construction industry	1	0	0	0	1
Manufacturing	122	34	6	6	179
Wholesale trade	95	8	2	3	110
Retail trade	29	2	1	1	35
Transportation and warehousing	52	9	4	4	76
Information and cultural industries	15	2	1	1	19
Finance, insurance, real estate, rental and leasing and holding companies	39	4	3	1	50
Professional, scientific and technical services	81	6	4	3	96
Administrative and support, waste management and remediation services	36	5	3	1	47
Educational services	1	0	0	0	2
Health care and social assistance	2	0	0	0	3
Arts, entertainment and recreation	4	1	0	0	6
Accommodation and food services	13	2	1	1	18
Other services (except public administration)	7	1	1	0	10
Non-profit institutions serving households	1	0	0	0	1
Government education services	3	0	0	0	3
Government health services	1	0	0	0	1
Other federal government services	3	0	0	0	3
Other provincial and territorial government services	2	0	0	0	2
Other local government services	3	0	0	0	4
Total	**1,286**	**80**	**33**	**24**	**1,457**

Table B.5 Direct and Indirect Annual GDP Impacts of the Construction of a New Underground Gold Mine ($ Thousands)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	45	11	5	2	75
Forestry and logging	55	34	5	28	137
Fishing, hunting and trapping	0	0	0	0	1
Support activities for agriculture and forestry	12	13	2	4	35
Mining, quarrying, and oil and gas extraction	3,431	188	987	136	5,868
Utilities	831	198	33	22	1,137
Non-residential building construction	14,885	0	0	0	14,885
Engineering construction	39,424	0	0	0	39,424
Repair construction	354	29	18	11	440
Other activities of the construction industry	193	6	7	2	211
Manufacturing	15,774	2,491	825	560	20,649
Wholesale trade	15,182	927	174	211	16,676
Retail trade	1,699	87	46	46	1,922
Transportation and warehousing	2,296	376	202	189	3,426
Information and cultural industries	1,133	131	78	63	1,479
Finance, insurance, real estate, rental and leasing and holding companies	6,148	440	225	146	7,141
Professional, scientific and technical services	9,774	410	301	157	10,732
Administrative and support, waste management and remediation services	1,638	193	99	51	2,042
Educational services	47	2	1	1	51
Health care and social assistance	41	5	1	2	51
Arts, entertainment and recreation	78	17	3	6	107
Accommodation and food services	240	38	20	21	340
Other services (except public administration)	364	37	71	15	506
Non-profit institutions serving households	32	3	1	1	39
Government education services	158	9	5	4	181
Government health services	32	5	2	1	43
Other federal government services	149	12	2	3	172
Other provincial and territorial government services	42	11	2	3	62
Other local government services	239	15	10	10	281
Total	**114,296**	**5,685**	**3,126**	**1,697**	**128,115**

Table B.6 Direct and Indirect Annual Employment Impacts of the Construction of a New Underground Gold Mine (Number of Jobs)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	1	0	0	0	1
Forestry and logging	1	0	0	0	2
Mining, quarrying, and oil and gas extraction	22	1	2	0	26
Utilities	3	0	0	0	4
Non-residential building construction	191	0	0	0	191
Engineering construction	412	0	0	0	412
Repair construction	5	0	0	0	6
Other activities of the construction industry	1	0	0	0	1
Manufacturing	167	29	7	6	221
Wholesale trade	126	9	1	2	141
Retail trade	40	2	1	1	45
Transportation and warehousing	30	5	2	2	43
Information and cultural industries	8	1	0	1	11
Finance, insurance, real estate, rental and leasing and holding companies	42	4	1	1	50
Professional, scientific and technical services	111	6	3	3	123
Administrative and support, waste management and remediation services	34	4	1	1	41
Educational services	2	0	0	0	2
Health care and social assistance	1	0	0	0	1
Arts, entertainment and recreation	2	0	0	0	3
Accommodation and food services	8	1	0	1	11
Other services (except public administration)	8	1	1	0	10
Non-profit institutions serving households	1	0	0	0	1
Government education services	2	0	0	0	2
Government health services	0	0	0	0	1
Other federal government services	1	0	0	0	1
Other provincial and territorial government services	0	0	0	0	1
Other local government services	3	0	0	0	3
Total	**1,220**	**65**	**21**	**20**	**1,353**

Table B.7 Direct and Indirect Annual GDP Impacts of a New Operating Underground Gold Mine ($ Thousands)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	104	30	11	4	174
Forestry and logging	27	19	2	14	75
Fishing, hunting and trapping	0	0	0	0	3
Support activities for agriculture and forestry	9	8	2	3	26
Mining, quarrying, and oil and gas extraction	187,411	329	3,147	439	192,598
Utilities	7,480	375	82	32	8,045
Non-residential building construction	197	0	0	0	197
Engineering construction	10,086	0	0	0	10,086
Repair construction	3,003	34	46	17	3,126
Other activities of the construction industry	178	7	10	3	202
Manufacturing	9,106	2,050	623	328	12,710
Wholesale trade	6,535	499	249	156	7,649
Retail trade	1,597	84	64	53	1,845
Transportation and warehousing	2,790	386	314	254	4,199
Information and cultural industries	4,047	332	222	187	4,979
Finance, insurance, real estate, rental and leasing and holding companies	13,881	710	439	233	15,566
Professional, scientific and technical services	11,361	652	353	247	12,761
Administrative and support, waste management and remediation services	2,784	286	174	84	3,417
Educational services	60	3	2	2	67
Health care and social assistance	134	9	2	3	151
Arts, entertainment and recreation	370	58	8	23	468
Accommodation and food services	806	85	44	49	1,033
Other services (except public administration)	799	57	133	26	1,040
Non-profit institutions serving households	89	7	2	3	106
Government education services	355	12	7	5	385
Government health services	82	8	3	2	99
Other federal government services	443	25	4	5	485
Other provincial and territorial government services	135	17	3	5	168
Other local government services	832	22	18	19	901
Total	**264,701**	**6,106**	**5,966**	**2,197**	**282,560**

Table B.8 Direct and Indirect Annual Employment Impacts of a New Operating Underground Gold Mine (Number of Jobs)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	2	0	0	0	3
Forestry and logging	0	0	0	0	1
Support activities for agriculture and forestry	0	0	0	0	0
Mining, quarrying, and oil and gas extraction	673	2	5	1	681
Utilities	27	1	0	0	29
Non-residential building construction	3	0	0	0	3
Engineering construction	110	0	0	0	110
Repair construction	44	0	0	0	46
Other activities of the construction industry	1	0	0	0	1
Manufacturing	93	20	4	4	128
Wholesale trade	58	5	2	2	68
Retail trade	39	2	1	1	45
Transportation and warehousing	38	5	3	3	53
Information and cultural industries	35	3	2	2	44
Finance, insurance, real estate, rental and leasing and holding companies	109	6	3	2	123
Professional, scientific and technical services	139	9	3	4	157
Administrative and support, waste management and remediation services	63	6	3	2	74
Educational services	2	0	0	0	2
Health care and social assistance	2	0	0	0	2
Arts, entertainment and recreation	10	2	0	1	13
Accommodation and food services	28	3	1	2	35
Other services (except public administration)	17	1	2	1	22
Non-profit institutions serving households	2	0	0	0	2
Government education services	4	0	0	0	4
Government health services	1	0	0	0	1
Other federal government services	4	0	0	0	4
Other provincial and territorial government services	1	0	0	0	2
Other local government services	9	0	0	0	10
Total	**1,514**	**67**	**30**	**24**	**1,662**

Table B.9 Total Annual GDP Impacts of the Construction of a New Open Pit Gold Mine ($ Thousands)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	286	130	44	21	596
Forestry and logging	76	40	7	37	180
Fishing, hunting and trapping	1	2	0	2	18
Support activities for agriculture and forestry	29	19	6	8	72
Mining, quarrying, and oil and gas extraction	3,345	243	1,752	168	7,283
Utilities	2,251	421	86	66	2,941
Non-residential building construction	28,702	0	0	0	28,702
Engineering construction	39,485	0	0	0	39,485
Repair construction	1,335	87	47	33	1,561
Other activities of the construction industry	257	11	13	5	291
Manufacturing	22,244	3,735	1,081	758	29,167
Wholesale trade	21,274	1,409	326	343	23,653
Retail trade	6,080	441	261	247	7,262
Transportation and warehousing	4,115	680	374	349	6,132
Information and cultural industries	3,270	381	222	167	4,234
Finance, insurance, real estate, rental and leasing and holding companies	16,281	1,230	598	487	19,087
Owner occupied dwellings	8,878	384	257	238	9,973
Professional, scientific and technical services	13,756	698	467	263	15,341
Administrative and support, waste management and remediation services	3,127	391	193	116	3,951
Educational services	144	8	4	5	164
Health care and social assistance	1,348	86	31	29	1,521
Arts, entertainment and recreation	631	89	20	35	796
Accommodation and food services	1,442	188	107	105	1,948
Other services (except public administration)	1,553	146	172	63	2,002
Non-profit institutions serving households	432	32	10	12	497
Government education services	848	40	29	22	968
Government health services	243	24	9	7	297
Other federal government services	306	23	6	8	356
Other provincial and territorial government services	98	30	5	8	156
Other local government services	879	44	33	34	1,009
Total	**182,716**	**11,014**	**6,159**	**3,639**	**209,644**

Table B.10 Total Annual Employment Impacts of the Construction of a New Open Pit Gold Mine (Number of Jobs)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	6	2	1	1	11
Forestry and logging	1	1	0	0	2
Support activities for agriculture and forestry	1	0	0	0	1
Mining, quarrying, and oil and gas extraction	21	1	3	0	26
Utilities	8	1	0	0	9
Non-residential building construction	361	0	0	0	361
Engineering construction	395	0	0	0	395
Repair construction	19	1	0	0	22
Other activities of the construction industry	1	0	0	0	2
Manufacturing	227	41	9	8	301
Wholesale trade	173	14	2	4	196
Retail trade	143	11	5	6	170
Transportation and warehousing	53	9	3	4	76
Information and cultural industries	21	3	1	1	27
Finance, insurance, real estate, rental and leasing and holding companies	99	10	4	3	121
Professional, scientific and technical services	154	9	4	4	174
Administrative and support, waste management and remediation services	64	8	3	2	80
Educational services	5	0	0	0	6
Health care and social assistance	25	2	0	1	28
Arts, entertainment and recreation	14	2	1	1	19
Accommodation and food services	49	6	3	4	65
Other services (except public administration)	41	4	3	2	51
Non-profit institutions serving households	9	1	0	0	10
Government education services	9	0	0	0	10
Government health services	3	0	0	0	4
Other federal government services	2	0	0	0	3
Other provincial and territorial government services	1	0	0	0	1
Other local government services	9	1	0	0	10
Total	**1,913**	**128**	**44**	**44**	**2,181**

Table B.11 Total Annual GDP Impacts of a New Operating Open Pit Gold Mine ($ Thousands)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	404	178	61	27	824
Forestry and logging	49	20	4	21	105
Fishing, hunting and trapping	1	3	0	2	23
Support activities for agriculture and forestry	30	14	7	7	68
Mining, quarrying, and oil and gas extraction	161,597	512	4,997	501	170,458
Utilities	24,340	1,055	155	88	25,809
Non-residential building construction	202	0	0	0	202
Engineering construction	10,334	0	0	0	10,334
Repair construction	7,930	106	89	45	8,234
Other activities of the construction industry	176	13	19	5	220
Manufacturing	15,703	4,446	1,155	818	23,417
Wholesale trade	13,368	1,171	480	345	15,813
Retail trade	6,935	482	354	289	8,319
Transportation and warehousing	6,024	904	658	474	9,035
Information and cultural industries	4,342	466	318	220	5,587
Finance, insurance, real estate, rental and leasing and holding companies	16,721	1,330	857	569	20,070
Owner occupied dwellings	11,222	419	384	271	12,542
Professional, scientific and technical services	8,957	739	510	285	10,693
Administrative and support, waste management and remediation services	3,038	426	278	140	4,029
Educational services	150	9	7	6	175
Health care and social assistance	1,832	96	46	34	2,039
Arts, entertainment and recreation	827	112	28	46	1,038
Accommodation and food services	1,831	220	145	133	2,453
Other services (except public administration)	1,643	166	194	74	2,153
Non-profit institutions serving households	538	36	15	14	616
Government education services	1,131	44	37	26	1,269
Government health services	314	26	13	9	378
Other federal government services	543	28	8	8	603
Other provincial and territorial government services	276	36	7	9	346
Other local government services	1,014	53	47	41	1,183
Total	**301,473**	**13,112**	**10,872**	**4,507**	**338,036**

Table B.12 Total Annual Employment Impacts of a New Operating Open Pit Gold Mine (Number of Jobs)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	8	3	1	1	15
Forestry and logging	1	0	0	0	1
Support activities for agriculture and forestry	1	0	0	0	1
Mining, quarrying, and oil and gas extraction	482	2	8	1	495
Utilities	86	2	1	0	90
Non-residential building construction	3	0	0	0	3
Engineering construction	110	0	0	0	110
Repair construction	113	1	1	1	117
Other activities of the construction industry	1	0	0	0	1
Manufacturing	147	42	8	8	219
Wholesale trade	116	12	3	4	138
Retail trade	167	12	7	7	199
Transportation and warehousing	73	12	5	6	106
Information and cultural industries	30	3	2	2	38
Finance, insurance, real estate, rental and leasing and holding companies	102	11	5	4	127
Professional, scientific and technical services	106	10	5	4	128
Administrative and support, waste management and remediation services	65	8	4	3	83
Educational services	5	0	0	0	6
Health care and social assistance	34	2	1	1	37
Arts, entertainment and recreation	19	3	1	1	25
Accommodation and food services	64	7	4	5	84
Other services (except public administration)	47	4	3	2	58
Non-profit institutions serving households	11	1	0	0	13
Government education services	12	1	0	0	14
Government health services	4	0	0	0	5
Other federal government services	4	0	0	0	5
Other provincial and territorial government services	2	0	0	0	3
Other local government services	11	1	0	0	12
Total	**1,822**	**140**	**60**	**50**	**2,133**

Table B.13 Total Annual GDP Impacts of the Construction of a New Underground Gold Mine ($ Thousands)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	234	108	36	18	492
Forestry and logging	69	39	6	33	166
Fishing, hunting and trapping	1	2	0	2	15
Support activities for agriculture and forestry	25	18	5	7	64
Mining, quarrying, and oil and gas extraction	3,539	201	1,501	163	6,782
Utilities	1,871	350	73	56	2,446
Non-residential building construction	15,191	0	0	0	15,191
Engineering construction	40,233	0	0	0	40,233
Repair construction	1,098	72	40	28	1,286
Other activities of the construction industry	224	9	11	4	253
Manufacturing	17,912	3,117	981	688	23,870
Wholesale trade	16,999	1,200	277	287	19,014
Retail trade	5,329	373	223	213	6,334
Transportation and warehousing	3,351	558	307	289	5,010
Information and cultural industries	2,702	317	188	141	3,509
Finance, insurance, real estate, rental and leasing and holding companies	13,394	1,017	508	414	15,743
Owner occupied dwellings	7,314	321	220	206	8,242
Professional, scientific and technical services	11,297	585	393	224	12,629
Administrative and support, waste management and remediation services	2,529	323	161	97	3,212
Educational services	120	7	4	5	137
Health care and social assistance	1,108	71	26	25	1,254
Arts, entertainment and recreation	520	74	17	30	658
Accommodation and food services	1,189	156	90	88	1,611
Other services (except public administration)	1,273	121	142	54	1,647
Non-profit institutions serving households	356	26	9	10	410
Government education services	699	34	24	19	800
Government health services	200	20	8	6	245
Other federal government services	247	20	5	7	289
Other provincial and territorial government services	78	25	4	7	126
Other local government services	716	36	28	29	826
Total	**149,816**	**9,201**	**5,287**	**3,149**	**172,494**

Table B.14 Total Annual Employment Impacts of the Construction of a New Underground Gold Mine (Number of Jobs)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	5	2	1	1	9
Forestry and logging	1	1	0	0	2
Mining, quarrying, and oil and gas extraction	22	1	2	0	27
Utilities	6	1	0	0	8
Non-residential building construction	191	0	0	0	191
Engineering construction	412	0	0	0	412
Repair construction	15	1	0	0	18
Other activities of the construction industry	1	0	0	0	1
Manufacturing	183	34	9	8	247
Wholesale trade	139	12	2	3	159
Retail trade	125	9	4	5	148
Transportation and warehousing	43	8	3	4	62
Information and cultural industries	17	2	1	1	23
Finance, insurance, real estate, rental and leasing and holding companies	82	8	3	3	99
Professional, scientific and technical services	127	8	4	4	144
Administrative and support, waste management and remediation services	52	6	2	2	65
Educational services	4	0	0	0	5
Health care and social assistance	20	1	0	0	23
Arts, entertainment and recreation	12	2	0	1	15
Accommodation and food services	40	5	2	3	54
Other services (except public administration)	34	3	2	1	42
Non-profit institutions serving households	7	1	0	0	9
Government education services	7	0	0	0	8
Government health services	2	0	0	0	3
Other federal government services	2	0	0	0	2
Other provincial and territorial government services	1	0	0	0	1
Other local government services	7	0	0	0	9
Total	**1,560**	**107**	**38**	**38**	**1,787**

Table B.15 Total Annual GDP Impacts of a New Operating Underground Gold Mine ($ Thousands)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	469	210	69	33	961
Forestry and logging	55	27	4	23	126
Fishing, hunting and trapping	2	4	0	3	29
Support activities for agriculture and forestry	34	17	8	8	79
Mining, quarrying, and oil and gas extraction	191,145	353	4,157	495	197,755
Utilities	9,650	609	151	83	10,624
Non-residential building construction	202	0	0	0	202
Engineering construction	10,334	0	0	0	10,334
Repair construction	4,565	96	84	43	4,839
Other activities of the construction industry	236	12	18	6	278
Manufacturing	12,881	3,118	896	542	18,392
Wholesale trade	9,776	954	436	283	11,804
Retail trade	9,062	471	377	333	10,511
Transportation and warehousing	4,863	700	509	433	7,231
Information and cultural industries	7,233	650	424	324	8,971
Finance, insurance, real estate, rental and leasing and holding companies	28,408	1,608	947	672	32,300
Owner occupied dwellings	14,552	389	366	281	15,795
Professional, scientific and technical services	14,329	956	518	365	16,389
Administrative and support, waste management and remediation services	4,555	509	290	166	5,679
Educational services	205	10	7	7	231
Health care and social assistance	2,258	95	45	36	2,463
Arts, entertainment and recreation	1,249	157	31	64	1,531
Accommodation and food services	2,699	272	170	167	3,466
Other services (except public administration)	2,506	177	263	86	3,113
Non-profit institutions serving households	721	38	15	16	805
Government education services	1,412	51	41	30	1,567
Government health services	416	28	13	10	483
Other federal government services	644	38	9	10	718
Other provincial and territorial government services	209	40	8	11	286
Other local government services	1,798	54	49	50	1,976
Total	**336,467**	**11,643**	**9,905**	**4,576**	**368,939**

Table B.16 Total Annual Employment Impacts of a New Operating Underground Gold Mine (Number of Jobs)

	Ontario	Quebec	Alberta	British Columbia	Canada
Industries					
Crop and animal production	10	3	1	1	18
Forestry and logging	1	0	0	0	1
Support activities for agriculture and forestry	1	0	0	0	1
Mining, quarrying, and oil and gas extraction	673	2	7	1	683
Utilities	34	1	1	0	37
Non-residential building construction	3	0	0	0	3
Engineering construction	110	0	0	0	110
Repair construction	65	1	1	1	68
Other activities of the construction industry	1	0	0	0	2
Manufacturing	124	30	7	6	177
Wholesale trade	85	10	3	3	103
Retail trade	219	12	7	8	252
Transportation and warehousing	65	10	4	5	91
Information and cultural industries	54	5	2	3	67
Finance, insurance, real estate, rental and leasing and holding companies	190	13	6	5	220
Professional, scientific and technical services	170	13	5	6	197
Administrative and support, waste management and remediation services	100	10	4	3	120
Educational services	7	0	0	0	8
Health care and social assistance	42	2	1	1	46
Arts, entertainment and recreation	30	4	1	2	37
Accommodation and food services	93	9	5	6	118
Other services (except public administration)	68	5	4	2	81
Non-profit institutions serving households	15	1	0	0	17
Government education services	15	1	0	0	17
Government health services	5	0	0	0	6
Other federal government services	5	0	0	0	6
Other provincial and territorial government services	2	0	0	0	3
Other local government services	19	1	0	0	21
Total	**2,204**	**134**	**60**	**54**	**2,509**

Appendix C: Impacts on International Imports by Commodity

Our calculations permit us to determine the impacts of the construction and operation of a new gold mine on the level of international imports into Ontario and Canada as a whole. The level of imports provides an indication of the opportunities for Ontario, and indeed Canadian, suppliers to supplant these imports. While the numbers are available for the induced impacts, the more relevant impacts are for the direct and indirect spending since these reflect the impact on suppliers directly from the mine's construction and operations. The induced impacts on international imports reflect the general spending patterns of consumers of their wages and salaries and thus do not provide any unique impacts of the Ontario mining industry either in the construction, or operation, of a mine.[6]

A New Gold Mine Under Construction

At the 'Small' or most highly-aggregated Statistics Canada commodity classification, Table C.1 shows the annual impacts on international imports from the construction of a new open pit gold mine and Table C.3 the impacts from the construction of a new underground gold mine.

In Ontario, for the $250 million annual expenditure on constructing an open pit mine, a total of $87 million is expected to be spent on suppliers from outside the country. At $35 million, the biggest international import, by far, is industrial machinery. Because of the nature of open pit mining, the next largest international import, at more than $15 million, is transportation equipment, followed by electrical equipment at $7 million. The remaining impacts are spread widely among a number of other commodities, the most important of which are fabricated metal products, primary metal products, computer and electronic products and professional services.

The $250 million annual expenditure to construct an open pit gold mine in Northern Ontario generates international imports into the rest of the provinces of about $5 million

[6] In Statistics Canada's Input-Output system imports are only available on a commodity basis, not on an industry basis as presented in Appendix B.

per year. These imports are quite widely dispersed across commodities with the biggest impact on primary metals at just over $1 million and industrial machinery at roughly $800,000.

The $200 million annual expenditure to construct an underground gold mine in Northern Ontario generates impacts on international imports into the province of more than $65 million. Once again the greatest impact, by a large margin, is on industrial machinery ($33 million) with electrical equipment a distant second ($6 million). The remaining impacts are spread widely among a number of other commodities, the most important of which are fabricated metal products, primary metal products, professional services and computer and electronic products. The annual expenditure to construct an underground gold mine generates international imports into the rest of the provinces of about $4 million per year. These imports are quite widely dispersed across commodities with the biggest impact on primary metals at just under $900,000.

Impacts of the Operations of a New Gold Mine

The impacts on international imports of a new mine in production can also be examined, and again we estimate the impacts on Ontario and Canada as a whole. These results for the direct and indirect impacts are presented in Table C.2 for the new open pit gold mine and in Tables C.4 for the new underground gold mine.

In Ontario, for an open pit mine that generates $300 million in annual revenue, close to $65 million is expected to be spent on suppliers from outside the country. At $15 million, the biggest international import is industrial machinery, followed by motor vehicle parts ($10 million), primary metal products ($9 million), chemical products ($7 million) and transportation equipment ($5 million). The remaining impacts are quite widely spread among a number of other commodities, the most important of which are mineral fuels, computer and electronic products, professional services, and refined petroleum products.

The $300 million open pit gold mine in Northern Ontario generates international imports into the rest of the provinces of about $7 million per year. The biggest imports are in mineral fuels ($2.7 million) and primary metals ($1.2 million), with the rest widely dispersed.

In Ontario, for an underground mine that generates $300 million in annual revenue, more than to $44 million is expected to be spent on suppliers from outside the country. These imports are widely dispersed across many commodity groups. At $7.5 million, the biggest international import is industrial machinery, followed by transportation equipment ($4.8 million), primary metal products ($3.5 million), chemical products ($2.9 million), real estate rental and leasing ($2.3 million), professional services ($2.2 million), and computer and electronic products ($2.1 million). The remaining impacts are quite widely spread among a number of other commodities, the most important of which are motor vehicle parts, fabricated metal products, mineral fuels, plastic and rubber products, refined petroleum products, transportation services and wood products.

The $300 million underground gold mine in Northern Ontario generates international imports into the rest of the provinces of about $4.4 million per year. The biggest import is in mineral fuels ($1.3 million), with the rest widely dispersed.

These international imports from both the construction and production phases of the new open pit and underground gold mines in Ontario indicate that there are real opportunities for both Ontario and other Canadian businesses to supplant these international suppliers.

Table C.1 Annual Direct and Indirect Impacts on International Imports into Ontario and Canada of the Construction of a New Open Pit Gold Mine ($ Thousands)

	Ontario	Canada
Grains and other crop products	29	34
Live animals	0	1
Other farm products	17	17
Forestry products and services	6	17
Fish and seafood, live, fresh, chilled or frozen	1	2
Mineral fuels	784	1,510
Metal ores and concentrates	331	381
Non-metallic minerals	136	142
Mineral support services	55	55
Utilities	17	22
Food and non-alcoholic beverages	72	96
Alcoholic beverages and tobacco products	49	57
Textile products, clothing, and products of leather and similar materials	271	298
Wood products	1,702	1,741
Wood pulp, paper and paper products and paper stock	361	413
Printed products and services	80	89
Refined petroleum products (except petrochemicals)	910	1,041
Chemical products	1,373	1,691
Plastic and rubber products	1,504	1,610
Non-metallic mineral products	991	1,051
Primary metallic products	3,650	4,737
Fabricated metallic products	3,972	4,193
Industrial machinery	35,480	36,273
Computer and electronic products	3,555	3,721
Electrical equipment, appliances and components	6,965	7,138
Transportation equipment	15,257	15,315
Motor vehicle parts	848	1,055
Furniture and related products	87	89
Other manufactured products and custom work	844	891
Wholesale margins and commissions	468	473
Transportation and related services	809	889
Information and cultural services	220	254
Published and recorded media products	103	116
Telecommunications	31	39
Depository credit intermediation	60	69
Other finance and insurance	376	418
Real estate, rental and leasing and rights to non-financial intangible assets	834	934
Professional services (except software and research and development)	3,335	3,389
Software	5	6
Administrative and support, head office, waste management and remediation services	736	813
Education services	5	6
Health and social assistance services	1	1
Arts, entertainment and recreation services	53	60
Accommodation and food services	320	364
Other services	28	32
Sales of other government services	2	2
Total	**$86,735**	**$91,544**

Table C.2 Annual Direct and Indirect Impacts on International Imports into Ontario and Canada of the Operations of a New Open Pit Gold Mine ($ Thousands)

	Ontario	Canada
Grains and other crop products	79	88
Live animals	1	1
Other farm products	2	3
Forestry products and services	2	6
Fish and seafood, live, fresh, chilled or frozen	1	2
Mineral fuels	2,897	5,628
Metal ores and concentrates	1,069	1,189
Non-metallic minerals	39	55
Mineral support services	57	61
Utilities	583	592
Food and non-alcoholic beverages	106	139
Alcoholic beverages and tobacco products	77	85
Textile products, clothing, and products of leather and similar materials	74	91
Wood products	174	188
Wood pulp, paper and paper products and paper stock	236	287
Printed products and services	88	99
Refined petroleum products (except petrochemicals)	1,335	1,566
Chemical products	7,115	7,642
Plastic and rubber products	618	724
Non-metallic mineral products	562	642
Primary metallic products	8,878	10,060
Fabricated metallic products	1,044	1,216
Industrial machinery	15,270	15,794
Computer and electronic products	1,835	1,959
Electrical equipment, appliances and components	765	865
Transportation equipment	4,714	4,780
Motor vehicle parts	10,335	10,498
Furniture and related products	19	20
Other manufactured products and custom work	138	178
Wholesale margins and commissions	193	200
Transportation and related services	1,052	1,146
Information and cultural services	335	382
Published and recorded media products	79	94
Telecommunications	35	45
Depository credit intermediation	40	52
Other finance and insurance	288	349
Real estate, rental and leasing and rights to non-financial intangible assets	657	791
Professional services (except software and research and development)	1,477	1,558
Software	70	71
Research and development	8	8
Administrative and support, head office, waste management and remediation services	617	728
Education services	4	5
Health and social assistance services	4	4
Arts, entertainment and recreation services	100	108
Accommodation and food services	383	429
Other services	24	30
Sales of other government services	5	6
Total	**$63,484**	**$70,461**

Table C.3 Annual Direct and Indirect Impacts on International Imports into Ontario and Canada of the Construction of a New Underground Gold Mine ($ Thousands)

	Ontario	Canada
Grains and other crop products	24	28
Live animals	0	1
Other farm products	12	13
Forestry products and services	6	17
Fish and seafood, live, fresh, chilled or frozen	1	1
Mineral fuels	677	1,325
Metal ores and concentrates	258	297
Non-metallic minerals	126	131
Mineral support services	62	62
Utilities	14	18
Food and non-alcoholic beverages	60	80
Alcoholic beverages and tobacco products	40	47
Textile products, clothing, and products of leather and similar materials	173	195
Wood products	2,170	2,213
Wood pulp, paper and paper products and paper stock	372	417
Printed products and services	65	73
Refined petroleum products (except petrochemicals)	801	911
Chemical products	1,131	1,388
Plastic and rubber products	1,227	1,312
Non-metallic mineral products	678	731
Primary metallic products	2,868	3,760
Fabricated metallic products	3,090	3,273
Industrial machinery	33,372	34,027
Computer and electronic products	2,636	2,799
Electrical equipment, appliances and components	6,273	6,445
Transportation equipment	1,585	1,630
Motor vehicle parts	626	750
Furniture and related products	70	71
Other manufactured products and custom work	798	839
Wholesale margins and commissions	394	399
Transportation and related services	665	733
Information and cultural services	185	214
Published and recorded media products	84	95
Telecommunications	26	32
Depository credit intermediation	48	55
Other finance and insurance	333	368
Real estate, rental and leasing and rights to non-financial intangible assets	700	781
Professional services (except software and research and development)	2,767	2,814
Software	5	5
Administrative and support, head office, waste management and remediation services	599	665
Education services	4	5
Health and social assistance services	1	1
Arts, entertainment and recreation services	44	50
Accommodation and food services	264	301
Other services	23	26
Sales of other government services	2	2
Total	**$65,359**	**$69,402**

Table C.4 Annual Direct and Indirect Impacts on International Imports into Ontario and Canada of the Operations of a New Underground Gold Mine ($ Thousands)

	Ontario	Canada
Grains and other crop products	163	173
Live animals	1	1
Other farm products	3	3
Forestry products and services	3	10
Fish and seafood, live, fresh, chilled or frozen	2	4
Mineral fuels	1,607	2,946
Metal ores and concentrates	501	615
Non-metallic minerals	208	219
Mineral support services	95	99
Utilities	186	192
Food and non-alcoholic beverages	205	257
Alcoholic beverages and tobacco products	165	176
Textile products, clothing, and products of leather and similar materials	367	389
Wood products	226	238
Wood pulp, paper and paper products and paper stock	1,021	1,121
Printed products and services	435	446
Refined petroleum products (except petrochemicals)	1,227	1,433
Chemical products	2,851	3,203
Plastic and rubber products	1,486	1,572
Non-metallic mineral products	410	463
Primary metallic products	3,535	4,140
Fabricated metallic products	1,668	1,781
Industrial machinery	7,501	7,797
Computer and electronic products	2,138	2,264
Electrical equipment, appliances and components	876	949
Transportation equipment	4,760	4,828
Motor vehicle parts	1,932	2,028
Furniture and related products	19	19
Other manufactured products and custom work	297	334
Wholesale margins and commissions	292	297
Transportation and related services	1,075	1,157
Information and cultural services	719	792
Published and recorded media products	758	773
Telecommunications	58	67
Depository credit intermediation	91	101
Other finance and insurance	791	846
Real estate, rental and leasing and rights to non-financial intangible assets	2,272	2,377
Professional services (except software and research and development)	2,204	2,279
Software	75	76
Research and development	8	8
Administrative and support, head office, waste management and remediation services	840	947
Education services	6	7
Health and social assistance services	3	3
Arts, entertainment and recreation services	247	259
Accommodation and food services	869	917
Other services	56	60
Sales of other government services	5	5
Total	**$44,253**	**$48,672**